

Value Analysis and Value Engineering: Basics for Purchasing Professionals

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Abstract. This paper discusses (a) basic techniques of value analysis and value engineering, (b) how they can contribute to sourcing decisions, (c) how they can be applied to products, services, and administrative processes, and (d) the two dimensions of value analysis and value engineering – the technical and the interpersonal.

Definitions. One of the challenges facing those in purchasing and supply management is the babble of terminology faced by everyone involved in the profession. One must constantly keep in mind that the same term means different things in different organizations, and that different organizations use a variety of terms to describe similar concepts. In any communication with individuals from other organizations, purchasing and supply professionals should clarify the meaning of technical terms so that miscommunications are minimized.

For purposes of this paper, *NAPM'S Glossary of Key Purchasing and Supply Terms, 3rd edition* (Tempe, AZ: Institute for Supply Management, 2000) was used for the following definitions.

Value analysis is "A systematic and objective evaluation of the value of a good or service, focusing on an analysis of function relative to the cost of manufacturing or providing the items or service. Value analysis provides insight into the inherent worth of the final good or service, possibly altering specification and quality requirements that could reduce costs without impairing functional suitability. " *Value engineering* is "Value analysis conducted at the design engineering stage of the product development process. " In summary *value analysis* refers to the analysis of an existing product, service, or administrative process while *value engineering* refers to the same analysis applied to products, services, or administrative processes that are under design and have not been finalized.

For purposes of this paper, I will use the term value analysis/engineering to avoid having to differentiate whether the product, service, or administrative process is current or under development. This is especially appropriate when products, services, and administrative process are constantly evolving and are seldom finalized indefinitely.

Basic Techniques of Value Analysis/Engineering. The basic premise of value/engineering analysis is that it an individual, or team, can identify potentials for efficiency gains. A focal point of this process is a series of questions. Two sources of useful questions are listed in the references at the end of this paper. A series of possible questions are listed below. They have been generalized in order to apply to products, services, and administrative processes.

1. Does it contribute value?
2. Is its cost proportionate to its usefulness?
3. Does it have functions that can be divided into sub-functions?
4. Has its requirements changed over time?
5. Does it have all of the needed features?

6. Does it have features that are not needed?
7. Can it be eliminated?
8. Is there a substitute for it?
9. Have subsequent events changed its original purpose?
10. Is its original purpose still relevant?
11. Are its requirements more stringent than currently needed?
12. Is it better done by our organization or by a supplier?
13. Is there a standard part, service, or procedure that can perform its function just as well?
14. Is it overcomplicated?
15. Can minor enhancements improve its performance substantially?
16. Can cost savings be achieved without substantial reductions in effectiveness?
17. Have supplier suggestions been sought?
18. Have user suggestions been sought?

Opportunities for high potential value analysis/engineering can be found by looking for products, services, or administrative processes that are:

1. of high dollar value or expensive
2. complicated, elaborate, or complex
3. have not been recently analyzed
4. depend on technologies that are no longer current
5. are not standardized
6. are new to the organization
7. affected by new products, new markets, and changing legal requirements
8. can be implemented with modest amounts of time and effort

Value Analysis/Engineering Contributions to Supply Management. During the last twenty years purchasing and supply management, along with most other areas of organizational activity, have evolved from a process (how many purchase orders were processed) to a strategic (how can our organization achieve meaningful differentiation, low cost, or both) orientation. This means:

- Make-or-outsourcing decisions may be driven more by access to world-class technology than by shaving a few percentage points off cost. A key issue here is likely to be whether the activity is core to the organization. Core competencies will tend not to be out-sourced (regardless of the “economics”) while peripheral activities may be actively outsourced so that the organization can focus its efforts on core activities.
- Lease-or-buy decisions have evolved from identifying the best financial options to gaining access to appropriate technology under favorable financial arrangements. For example, obtaining a better price for a longer commitment might be offset by being locked into obsolescent technology during the term of the lease. Similarly, a decision to buy might lock an organization into equipment that is difficult to replace when it becomes obsolete.
- Supplier involvement in product and process development has become increasingly important. This means that purchasing and supply management must become involved in new product and processes development programs at (or before) the idea stage. In addition, purchasing and other areas of the organization must be skilled at integrating the development efforts of multiple suppliers to develop competitive products, and improved production and administrative processes, on time and within budget.

- Finally, cost avoidance/reduction opportunities must increasingly be coordinated among external and internal customers, other interested organizational departments, and suppliers throughout the supply chain (or the supply web).

The implications of these changes mean the scope of value analysis/engineering has evolved from an internal focus to one that transcends organizational, inter-organizational, and international boundaries. This means that value analysis/engineering must increasingly be thought of as a philosophy used by purchasing and supply management professionals in a wide range of situations with an array of participants.

Applications of Value Analysis/Engineering. The application of value analysis/engineering techniques to products and services has long been recognized. However, these techniques are equally important to administrative processes. This is especially important to supply management professionals because much of what we do is manage administrative processes.

Historically, value analysis/engineering was applied to tangible products. According to the *Wall Street Journal* (October 6, 2004, page A-1), General Motors wants to reduce the types of radios in its cars worldwide from 270 to 50 for a 40% savings. Other examples of savings in tangible products include rationalization of MRO (work gloves, lubricants, and repair parts), substituting one material for another to reduce the total costs of manufacturing, finishing, packaging, distribution, returns, and warranty claims.

Services often benefit from the questioning philosophy of value analysis/engineering. In one case, the statement of work for janitorial services stated "vacuum all offices daily." A bidder pointed out that only high traffic areas need to be vacuumed daily while low traffic areas only need to be vacuumed weekly. The resulting RFP resulted in cost savings (even though the successful bidder would not have vacuumed low traffic areas daily regardless of what the statement of work specified). Substantial savings in service purchases can be accomplished by focusing on the result of the service rather than the details of what services must be provided. When the focus of the service buy is the desired results, pre-bid meetings with potential suppliers can provide the dynamics needed to incorporate cost savings and efficiency gaining ideas into statements of work.

Administrative processes have not received much attention from value analysis/engineering advocates. Purchasing and supply professionals develop, coordinate, and participate in a wide range of administrative processes. They include supplier identification and qualification, developing and administering RFPs and contracts, monitoring supplier performance, negotiating internally and externally, and developing and implementing buying procedures and policies. During the 1990s purchasing underwent a revolution in procedures. The "traditional purchasing cycle (receive a requisition, selecting a supplier, issuing a purchase order, follow-up and expediting, reconciling the purchase order with receiving, and authorizing the invoice for payment) evolved into programs of p-cards, systems contracts, annual contracts, and electronic ordering. Other purchasing and supply management processes lend themselves to value analysis/engineering techniques. They include monitoring of supplier performance, monitoring supplier financial health, development of specifications and statements of work, supplier qualification, development of negotiation strategies, and the development and management of supplier agreements.

The Two Dimensions of Value Analysis/Engineering. Most discussions of value analysis/engineering focus on the techniques of the process. However, the greatest challenges are often interpersonal. Questioning current practices (product, service, and administrative) and suggesting new ideas are often met with active and passive resistance. This section reviews some skills that are needed by those who hope to accomplish change through the use of value analysis/engineering, or other change processes. The following summarizes some skills that can be useful to those who are leading, or participating, in value analysis/engineering processes:

- The idea champion. Being able to take an idea and sell it to others. This often makes the difference between genuine improvements and just another idea whose time has not come.
- Innovative thinking. The ability to generate lots of ideas may be more helpful than searching for that perfect solution. The generation of ideas often stimulates additional ideas. The give-and-take among those with ideas often leads to blended ideas and buy-in by other members of the organization.
- Playing multiple roles. Knowing when to lead, follow, play as part of the team, and get out of the way often enhances your ability to facilitate the value analysis/engineering process.
- Developing a sense of timing. There are times when an idea's time has not come. There are other times when that idea's time has come. Know when to back off and know when to push.
- Be a good communicator. Be able to express yourself well and clearly to a range of individuals. More importantly, be able to listen, hear, and empathize with others. The better another believes that you understand their point of view the more likely they will try to understand yours.
- Sales ability. Individuals proposing changes resulting from value analysis/engineering have to identify others who can support their ideas, understand their objections, convince them why the change is beneficial, and solicit their support.
- Positive attitude. Identifying ideas is often the easy part of value analysis/engineering. Selling the idea to others is often frustrating and time consuming. A positive attitude and a sense of humor are often important to gaining acceptance of your ideas by others.
- Persistence and patience. Persistence means being able to pursue an idea whose time has come. Patience means being able to let something lie dormant when its time has not come. However, being able to persistently champion a dormant idea may help its time come.
- Overcoming the "not-invented-here" syndrome. Many are resistant to ideas that are not theirs. One approach to overcoming this syndrome is to include others in the idea generation process, encourage ideas that others offer, and allow others to think they thought of your idea.

When combined with good technical skills, individual interpersonal skills can facilitate value analysis/engineering processes to benefit the organization, enhance your value to your employer, and provide you with the professional satisfaction of seeing your ideas accepted.

Conclusion. Value analysis/engineering can enhance products, production processes, services, and administrative processes. The process requires a combination of technical and interpersonal skills. The former generates the ideas that enable your organization to survive

and prosper in a competitive environment. The later enables you to facilitate ideas through the labyrinth of organizational obstacles that often have to be liberated.

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