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Purchasing World
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What's ahead

Keep an eye on aluminum. Another increase this year is a possibility. For a rundown of other key commodities see p.144.

Don't rule out possible spot shortages of wire electrodes, some steel strip products, special quality steel bar products, and some alloy products by yearend—despite signs of some easing on the supply front.

Be prepared to live with some across-the-board tightness in HDPE supplies into 1977, when new capacity additions begin to come on stream.

Expect general strengthening in ocean freight rates to continue well past 1980.

Look for the task force investigating OSHA to recommend a general shift away from the present system of "inflexible" standards to a system of less rigid performance standards.

Brace for additional price increases on resistors, capacitors, and connectors as electronics industry seeks to recoup lost profits of the past two years.

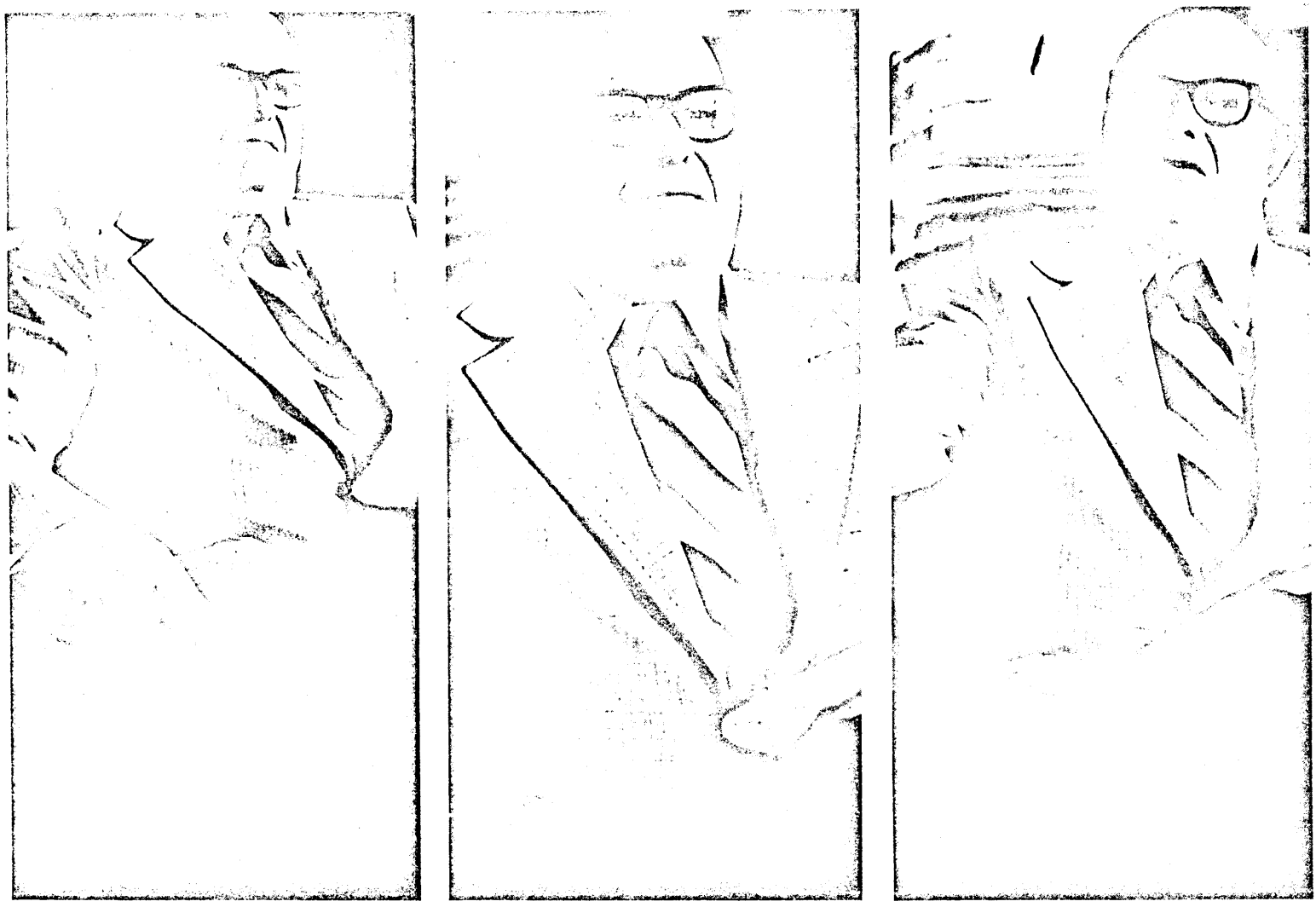
The road to value analysis

Easton, Md.: Mention value analysis to many purchasing people and they react with something like, "Oh, that's just cost savings—we do that all the time."

But VA is more than just cost savings. It's a disciplined approach to eliminating *all* unnecessary costs. For some products, that can mean savings of as much as 50%.

VA is the brainchild of Lawrence D. Miles (photo) who developed the discipline in 1947, when he was a member of GE's corporate purchasing department. He's been practicing and teaching the techniques ever since.

This month PW presents a special in-depth look at VA through the eyes of the man who started it all. That's followed by the first installment of a new VA column written by Miles. This entire package begins on p.32.



VA: Function is the thing

Easton, Md.: Purchasing executives have never been loath to borrow techniques from other functions. In fact, most of the methods and procedures used for anything besides "straight" buying have been adapted from marketing, estimating, production and inventory control, costing, or finance. The criteria has always been simply—does it work? If so, it gets adapted.

The one major exception is value analysis. VA is about the only effective technique that was originated and developed by purchasing. The date: 1947. The place: General Electric. The man: Lawrence D. Miles.

As a young GE engineer, Miles' concern with lower costs, and his drive for blending engineering with the economic factors of the marketplace, came to the attention of then VP-purchasing Harry Erlicher, who convinced him to join the corporate purchasing staff. After six years there Miles was named PM for a division, but returned to corporate purchasing in 1947 with his schedule cleared so he could research and develop workable techniques for more cost effective achievements by plant personnel. That work resulted in the basic VA approach. Subsequent work through 1950 led to more sophisticated refinements.

In the almost 30 years since then Miles has used and taught those techniques constantly—first at GE, then later as a consultant. In addition, he has written numerous articles on value analysis. In 1952 he wrote the booklet "Cutting Costs by Analyzing Values" for NAPM (then NAPA), and in 1961 published the definitive "Techniques of Value Analysis and Engineering."

VA, according to Miles, is a rigorous, disciplined approach for developing the lowest possible cost of an item without sacrificing any of its quality or usefulness. Properly applied, VA can result in savings of 50%.

Oddly enough, however, purchasing executives recognize that dramatic savings are possible with VA, yet do little about it. Masquerading under the name value engineering, VA is used more often by other departments than it is by purchasing.

Although Miles is upset about that, he feels the situation could—and should—be reversed. That's just one of the things PW learned recently when we traced Larry Miles to his retirement home. Here's what else the father of value analysis thinks about where his brainchild has been, where it is now, and where it's heading in the future:

Q. It has been said that value analysis is the only pure purchasing technique, in that it was developed in purchasing departments at GE and Ford at about the same time.

A. That may be true. Most other systems have been borrowed and adapted by purchasing. VA was originated in purchasing.

But the idea that VA sprang up independently at GE and Ford at the same time is a myth. When I started VA at GE in 1947, Ford had some very well defined cost reduction and manufacturing engineering programs in place. Those people who think VA started there probably confuse it with those techniques.

Q. What's the difference between them?

A. Cost reduction and manufacturing engineering programs, although they often use some of the same approaches, are designed to reduce costs. VA starts

at the point of value—which is the combination of cost and function. VA asks what does it do? as well as what does it cost? VA techniques are concerned with improving value and eliminating costs that do not buy wanted function.

Q. Could you expand on that a bit?
A. Value analysis takes a three pronged approach. First is a function analysis in which you determine what the item does. Next is the problem setting system. That's where you actually determine what the problem is that you are trying to solve. Finally comes the problem solving system, in which you carry out the distinct steps of the job plan, search out information, and review the problem trying to solve it. Sometimes the review alone solves the problem. But it is at this stage that you apply creativity to solving the problem.

Q. Let's explore those steps.
A. Fine. But let's start with a definition of VA. In its purest sense, value analysis is a problem-solving system that uses a specific set of techniques, a body of knowledge, and a group of learned skills. Its sole purpose is the efficient identification of unnecessary cost; that is, cost that provides neither quality nor use nor life nor appearance nor customer features.

Q. How do we know whether the product cost provides for any of them?
A. That's where the function analysis comes in.

Basically, all cost is for function—either use function or aesthetic functions. Use functions entail some action the product user wants performed, and aesthetic functions please him. Before anything else can be done, the functions must be identified, clarified, and named fairly specifically.

Q. That seems like a drawn-out process in itself.
A. Not really. Whenever possible—which is almost always—functions are named using a verb and noun that have measurable parameters. This allows measurement of the appropriate cost for a specified function in very specific terms.

Q. You mean functions can actually be summed up in just two words?
A. Absolutely. For example, the function of a cable is to conduct current. The function of a table leg is to support weight. Or, try this one. The function of language is to communicate intelligence. As a matter of fact, it should never take more than a sentence to identify any function. If it does, it's probably the product that's being described, not the function.

Q. What do we do once we have that definition?
A. You use that to see if you have a problem by asking three questions:

(1) Is that *exactly* what the product —or part—does?

(2) Is that *exactly* what we want it to do?

(3) Is that *exactly* what we are paying for?

Q. In other words, we move right into the problem setting phase?
A. That's right. Fundamentally, you have to ask yourself what you are trying to do. Is it to improve cost? If so, by how much? Is it to improve quality? Change the aesthetics? What? But the questions are answered in terms of fulfilling the function of the item. For instance, if the object is to improve cost, you might evaluate the functions by asking how much, under our conditions of quantities, manufacture, etc., is the lowest cost that would provide that function? That would be followed up by asking what approach and method would secure that function for that cost?

Q. Doesn't the answer to that question solve the problem?
A. Sometimes it does. But more often it is a springboard to examining alternate approaches, new materials, and completely different methods of manufacturing. At this point, though, we are merely looking to identify the problem, and determine its magnitude.

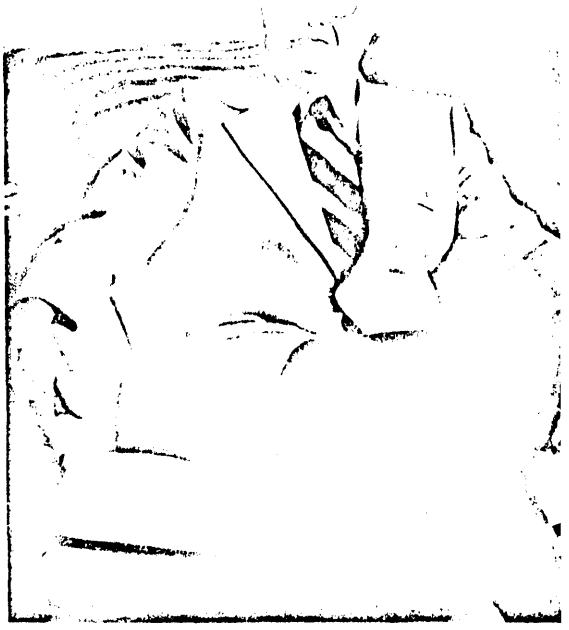
Q. How is that done?
A. Obviously, the first step is to identify functions. Next they have to be separated and grouped into subfunctions, each of which is "mind sized"—that is, small enough to be handled individually. To demonstrate, take the case of a refrigerator whose manufacturing management assigned the task of selling for $100. This was to replace one selling for $125. The steps in making the problem solvable were as follows:

(1) List functions that must be performed (there are five of them).

(2) Assign a value to each subfunction (the present cost and the required cost).

(3) Repeat the process for each subfunction. Example: The control subfunction, itself, performed six functions: sensing temperature, actuating contacts, interrupting circuits, providing adjustment, mounting and protecting, pleasing customers. Each of them was assigned a present and required cost.

Q. It seems that you've already started to solve the problem?
A. There is a great deal of overlap between the two. It is in the problem-solving stage, though, that the dis-



ciplined creative work begins.

Q. How so?
A. Problem solving proceeds by the use of one "mind tuning period" followed by four periods involving totally different types of mental work, each of which is completed before the next is begun. In mind tuning the question "exactly what are we trying to do?" is asked and discussed. Then the four different types of thinking are begun —each of which is exhaustively completed before starting the next.

Q. What are those four areas?
A. First is the information step, in which the search is for: What happens? What has happened? What are the facts? What are the valuable related facts? What are the assumptions? What are the quantities? What are the costs? What facts are needed, obtainable, but not present?

Next is the analysis step, in which a belief in the meanings contained in all the information is developed. Functions are established and broken down into solvable and comparable groups. The exact problems to be solved are given precise wording.

Q. What's next?
A. The creativity step, in which all judgment thinking is deferred, the problems identified in the analysis step are examined, and the widest range of possible approaches to the solution are listed.

After that comes the judgment step, in which the listing from the creativity step is searchingly, thoughtfully, and creatively combed to provide one or two new approaches.

Q. And after that?
A. Those four steps are basically it. Of course, they are followed by development and refinement work in which definite steps toward implementation are taken.

Q. By the way, where does the name come from?
A. Actually it was an accidental thing. The chief engineer at the time wanted to know what I called the approach. I didn't have a name for it until he noted that cost and performance (which is what's being evaluated) make up value. He said, "It's analysis of value, not of cost. Why not call it value analysis?" And the name stuck.

Q. Most people — even purchasing people—seem to recognize the term value engineering more than value analysis. Are there differences between VA and VE?
A. VA and VE are one and the same thing. In fact, the switch to value en-

gineering had nothing to do with the techniques. Admiral Leggett, who was the head of the Navy's Bureau of Ships at the time, was very concerned with skyrocketing costs. He'd heard some good things about what we were doing at GE and arranged to send a study group over to see us.

The admiral was impressed with the technique, and wanted to implement it right away. But there were no billets for an "analyst" on his staff. There were plenty of engineering slots, though. So rather than waste time trying to create a new title, he changed the name to value engineering.

Q. Do you think the word "engineering" leads purchasing people astray?
A. That's hard to say. The word certainly lends a tone that is lacking in the word "analysis." But in line with that, SAVE (Society of American Value Engineers) doesn't have as many purchasing members as it should.

Q. Isn't that a reflection of the fact that purchasing, in general, has not taken to value analysis? Or rather, purchasing seems to have adopted it as a buzzword, but not actually pursued it as the vigorous discipline you insist on.
A. Unfortunately, that is true. VA is recognized as a major contributor in administrative fields—such as hospital management and government management. And of course in production and design engineering. But it has never developed at its proper rate in purchasing.

Q. Jack Prendergast (Miles' one-time assistant, currently head of a value analysis consulting firm) has said that he doesn't dare tell clients to expect the kind of savings possible because nobody would believe a consultant who promised savings of 50%. But he insists that such results are easy. Do you agree with that?
A. Jack is really saying, "50% of some situations is often possible." I agree. I also agree that to say, "50% over-all on materials, fuels, and services sounds, and is, unrealistic. But the 5% to 15% over-all that is achievable makes a worthwhile addition to earnings.

Q. Yet, despite such dramatic possibilities, purchasing people have not taken to the system. Why?
A. In a word, education. Training in VA is not provided by colleges, as it is for other good techniques in purchasing, engineering, accounting, etc. And quickie courses are next to useless.

VA cannot be taught in a one, two, or three-day seminar. It curdles my blood every time one of those is announced. A man getting that kind of "training" doesn't learn enough to solve the practical problems he'll face. So of course, any VA work he attempts fails. And the discipline is held in ill repute by him and his managers.

Q. Do you mean to say that short courses are no good at all?
A. The short seminars that teach awareness of VA and what it can do are of great value to managers. Armed with that awareness, the manager has first to go out and learn the system.

Q. How long should VA training take?
A. SAVE has established a minimum of 40 hours—half lecture and half actual application. But that much training only gives a person enough so he can handle some situations, and puts him at a training level where he can continue to learn and grow.

Q. Other than the lack of purchasing acceptance, are you happy with your brainchild?
A. How can a father not love his child? Seriously, VA has accomplished much and there's much more it can do. We now have a special society based on people who are committed to it —

Q. Let's talk about SAVE?
A. SAVE was formed about 10 yea ago, and has grown very nicely. I purpose is to promote VA, and to e able a faster sharing of information.

I was the first president, but nev liked the name. It's a little too cute, begin with. But more importantly, t name tends to exclude people fr functions where VA belongs, but whi are not engineering disciplines.

Q. Is it accomplishing its goals?
A. Oh yes. SAVE established star ards of excellence for certificati which has made it possible for ma more people to learn VA. This l managers hire people of competen That's been an essential task, very w done by the society. And, with the e ception of the lack of PMs whom has not reached, SAVE has done good job of promoting the educati and use of VA.

Q. What else are you particularly hap about?
A. Well, if you talk about VA bei my child, then I have two grandchi ren as well that I'm proud of. VA l spawned two other approaches—o for designers, primarily, and one purchasing people.

Q. What are they?
A. The first is the concept of desi ing to cost. Based on seeing VA action, managements saw that origi designs could be reduced in cost, w no loss of quality.

More important for purchasing p ple is the concept of life cycle costi This is a technique of looking at total cost of something for the life the product. If you think about it, obvious that doing that is merely e step in value analysis on a grand sc —getting facts, then basing decisi on the facts.

Q. What does the future hold for V
A. There's so much proven value the techniques that we'll see colle teaching the system. This is alre starting in some schools. So we sho have a pool of graduates that have VA skills. I think VA has shown t mendous growth and acceptance in twenty years it's been around.

Q. What's ahead for Larry Miles?
A. As you know, I'm about 80% tired now. And I'm working as h as I can to make that 100%. It's ti for younger men and women to p up the ball. But, I'm steamed up ab this enormous unused purchasing tential, and I'm going to do some w to get purchasing back on the horse *(One of the ways Miles hopes to complish that task is with a mont column on value analysis in PW. stallment one follows on p. 38.)*