



PW Principles of value analysis

Function knowledge is timeless

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Lawrence D. Miles has been practicing and refining value analysis since he originated the techniques as a member of GE's corporate purchasing department almost thirty years ago. He has written and lectured extensively on VA, and has published two books on the subject: "Cutting Costs by Analyzing Values," and "Techniques of Value Analysis and Engineering." He is a fellow of the Society of American Value Engineers (SAVE), and served as its first president. And he is a holder of the Distinguished Public Service Award—the highest military honor awardable to a civilian—given him for benefits accrued to the U.S. Navy from the use of VA techniques.

Let's review how we're progressing in our study of how to buy function:

■ We have developed a feel that the money we spend is spent for some needed function.

■ We have seen that as we deepen our understanding of specific functions we acquire knowledge that is essential to good buying—and that as we gain knowledge we become able to use our professional purchasing skills to buy function advantageously.

■ We have discovered that as we buy function, important amounts of unnecessary, noncontributing costs are eliminated.

■ We have learned how to communicate, in function language, with our potential suppliers, and how to maximize the benefits of their capabilities.

■ We have found that the two kinds of function—use and aesthetic—are handled in the same way.

We do have a way to go, though. We have not yet learned exactly how to:

(1) Reduce the difficulty in getting to know functions.

(2) End objections which sometimes arise when function information is invited.

(3) Usefully divide all costs between use and aesthetic function.

(4) Determine, in dollars, the value or worth of a function even before we have a good quotation.

These will follow in due course. Today we'll go a little further as we follow the process of buying the function "interrupt circuit" for the temperature control we examined last month.

The exact function to be bought is "break electric circuit" or "stop flow of electric current." This is done by a silver contact surface and its immediate mounting—which costs \$22,000/million. The buyer wants to purchase the exact amount of silver needed, properly shaped, so that all of the silver bought is usable. And he wants it on a mounting which is produced by the most efficient manufacturing process available.

The first step, remember, is to develop basic knowledge. The buyer found that in general, each time a contact is opened a little of the contact is eroded away. To minimize this "vaporization," a superior heat conductor—usually silver—is used. The amount of contact wear depends on the amount of current, whether it's AC or DC, the amount of inductance in the circuit, the speed of opening, and a few other variables. It is a useful practice, therefore, to plot curves showing the number of "openings" to be expected by a particular amount of silver, under particular conditions.

Laying out the program

The buyer involved selected three leaders in the electrical contact field, provided them usage information of that type, and samples of the contact being used. And he told them the program was to achieve or surpass all of the usable life, safety, and quality of the contact at much lower cost.

The suppliers pointed out that with the existing design, only 1/10 of the silver could come into useful contact, and, among other things, a lot of expensive handling was required in fabrication. One of the vendors suggested two changes: He would perform the manufacturing, brazing, coining, and similar operations while the material was in strip form, then cut off the individual contacts in the final operation. And during the shaping and coining stages he would provide a shape that allowed much more of the silver to come into active position as a result of contact wear.

The new parts would be totally interchangeable with the existing design—and would cost half as much. Again, by buying function, the buyer lowered costs—this time by \$11,000/year for each million contacts used—and got an

improved product in the bargain as well.

Function knowledge, once gained by the buyer, is useful always. For instance, this same buyer observed other contacts he was buying, and one of them really startled him. In performance it operated very seldomly, and under controlled conditions. And it seemed to contain an excessive amount of silver for the number of openings involved.

Studying the function, he found the contact was used a maximum of 1,000 times/year. The data in hand showed that there was enough silver to operate the contact several million times.

He submitted the function to his vendors, had the proposal he wanted to use verified and approved by the product engineer, obtained samples, and provided them to Underwriters Laboratories for testing. If UL approved them they would cost \$26,000/year less than the contact being used. UL did approve the new contacts, and they were put into use.

As a guide to his future function buying, the buyer investigated the circumstances which had taken \$26,000/year out of the company till. Here's the story—unfortunately, an all too common one.

During the original design work, reasonable and appropriate contacts had been developed by theory and test, and had been selected for use, by the design engineers.

During the assembly of samples to be sent to Underwriters Laboratories for approval, however, some manufacturing mistakes were made and the available prototype contacts were accidentally destroyed.

The engineer was called on for more contacts. Not having any more of those on hand, and being desirous of avoiding further delay, he provided available contacts from other equipment to the assemblers. The assembly was completed with those substitute contacts, sent to UL, approved, and put into production.

Once a product has UL approval, it must be made with the approved components. Thus, nothing more was noted or done until, in the course of buying function, the buyer found (and took the first steps to eliminate) the extra cost of \$26,000 that made no contribution to either use or aesthetic function of the product.