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Value Analysis

Creative study of materials, parts cuts costs, says GE's L. D. Miles

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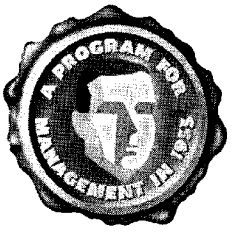

Value Analysis:

Equal or better performance at lower costs

INDUSTRY'S NEWEST specialist has dollar signs for eyes, wears a Sherlock Holmes hat and diplomat's striped pants, comes equipped with an insatiable curiosity and hasn't learned the meaning of "it can't be done."

His title: Value Analyst.

His achievements: For a Chicago company he lopped $185,000 off the annual price tag for steel —yet he did not cut down on the amount of steel the firm uses.

In a New York plant he recommended the use of a forging instead of a weldment in a compressor component and saved the firm $150,000 per year.

In another plant he suggested redesigning a machined component so that it could be produced as a stamping. Savings were $39,000 a year.

Definition

Although value analysis has a variety of names (purchase analysis, value engineering, cost and engineering analysis), simply defined it is: A *creative* study of every item of cost in the parts or materials you use.

Value analysis is not a substitute for the engineering and manufacturing cost reduction work being done by every progressive company. It's a supplement — it focuses the attention of engineering, manufacturing and purchasing on one objective: Equal or better quality, or performance, at lower cost.

L. D. Miles, General Electric Co.'s manager of value analysis, challenges industrial management with this thought: "On the average, one-fourth of the manufacturing cost is unnecessary. The extra cost continues because of patterns and habits of thought, because of personal limitations, because of difficulties in promptly disseminating ideas, because to-

GE certificate helps promote value analysis

day's thinking is based upon yesterday's knowledge."

Companies have been surprised by the immediate effectiveness of their value analysis programs. Carrier Corp., Syracuse, N. Y., entered its program in September, 1953, with one purchase analyst. By the end of the year, his cost-cutting ideas had saved $96,000. Last year, Caterpillar Tractor Co., Peoria, Ill., saved over $1 million from ideas generated in its engineering and cost analysis division. GE's program was started in 1947. Its first project saved 30 cents per unit. This amounted to an annual savings of $300,000. Now it's a multimillion dollar saving operation.

Responsibility

How do you set up a value analysis program? What responsibility is involved? Where does authority begin and end?

A look at some of the more successful programs in metalworking will suggest methods for tailoring a program to fit your organization.

Value analysis usually comes under the purchasing arm rather than engineering or manufacturing. There are sound reasons for it: 1. By nature, purchasing is cost conscious. 2. Purchasing is a company's most active contact with the outside industrial world —its new ideas, methods, materials and products. 3. Purchasing's position as a clearing house for all requisitions of parts and materials gives it a more sweeping knowledge of over-all plant activities.

This does not mean that the buyers and purchasing agents take on a "second activity" as value analysts. Most exponents believe that to do an effective, creative job, the value analyst should not be handcuffed with buyer routines —interviewing salesmen, negotiating contracts and handling accompanying paper work. The value analyst should have a full-time job of "brain-sweating," hard study and follow-through with engineering, manufacturing, purchasing and outside suppliers.

Not all companies with successful value analysis programs feel that a "specialist" is necessary. Allis-Chalmers Mfg. Co., Milwaukee, and Rheem Mfg. Co., Chicago, favor the committee aproach.

Group Thinking

A value analysis committee, formed of members representing manufacturing, engineering and purchasing, meets regularly to explore avenues for cost cutting. Generally, projects are programmed and assignments for investigation are delegated to members in their fields.

If you're considering the committee approach: 1. Be sure that the committee meets regularly. 2. Be sure committee members are key men with authority to make decisions. One of the aims is to close the gap between the conception of an idea and its adoption. Using junior men who must wrestle with red tape through "proper channels" will defeat the purpose of the program. 3. Be sure committee members can devote adequate time to the program. The

biggest hazard will be that the members will not have enough time to do a good job. If necessary, reduce some of their lesser responsibilities.

By its nature, value analysis will fail if the utmost in interdepartmental co-operation is not achieved. Assigning authority to the analyst is a critical consideration. In most companies, the value analyst is directly responsible to the director of purchases. His function is in a staff rather than line capacity. He has no direct authority over purchasing, engineering or manufacturing activities.

The value analyst's only capacity should be to study, recommend and advise. But in this role he should be assured full co-operation in carrying out his responsibilities. Final authority for the adoption of his recommendations should rest with the departments directly affected.

Striped Pants

Twin keys to a successful program are the organization of the program and the selection of personnel. But, first of all, a value analyst must be a diplomat. In practically every job he undertakes he will be treading upon prior decisions and judgments of others. It takes top skill in human relations to create the proper atmosphere for an effective value analysis program.

For peak effectiveness, the value analyst should have few strings limiting his areas of operation. He'll be crisscrossing departmental lines searching out all the facts of his cost-cutting problem. Here are the guideposts of his work:

1. Is it possible to eliminate or simplify the part?
2. Can it be altered so that a high-speed method of production can be used?
3. Can it be altered so that standard parts or materials can be used instead of high-cost specials?
4. Is a design change practical to permit automatic assembly rather than hand assembly? Will a design change lower material costs?
5. Will a lower-cost material do the same job? Or will a higher-cost material enable cost savings in other phases of production?
6. Are correct fabrication methods being used?
7. Is the best supplier for this part being used?

Areas of Operation

The major areas of his operations, with some examples, include:

Materials Substitution — New technology and changing prices are big factors here. The new leaded steels, for example, are paving ways to cost cutting. A Chicago value analyst found that even though leaded steel costs more initially, the savings in machine time substantially reduce the cost of the end item. A. C. Gilbert Co., New Haven, Conn., discovered that by using tin plate rather than electrozinc plated steel for its model train track it could save $40,000 per year.

Check your postwar cost comparisons between castings and forgings. Chances are that you will find that the price fluctuations in the last ten years would

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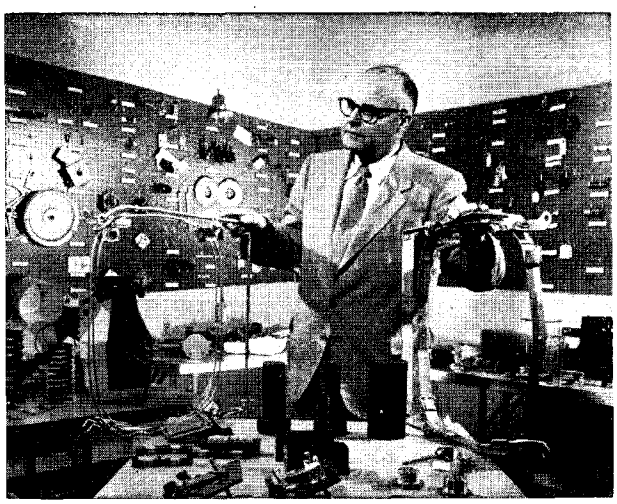


Meet Mr. Value Analysis

VALUE ANALYSIS at General Electric was conceived in 1947 to solve a problem.

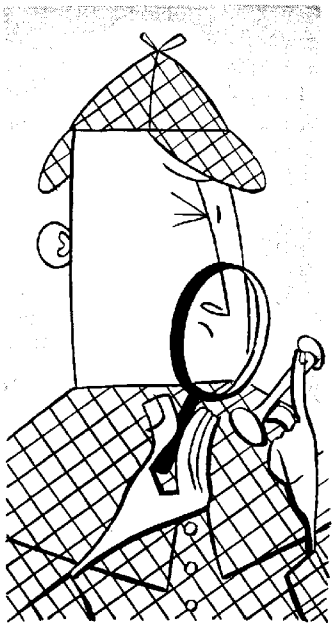
As at many companies, GE's first emphasis had been basically to accomplish new engineering advances—create new products, make existing ones work better or last longer. But officials became concerned with the almost continuous increase in costs. Benefits from new and better products could not accrue if people couldn't afford to buy the products.

So the target was drawn: Equal performance at lower cost. The job of developing a program to hit the mark went to L. D. Miles. With a small group of engineers, he has developed GE's value analysis methods and techniques which have eliminated millions of dollars in "wasted" costs from GE products.

In recognition of his accomplishment, Mr. Miles received the Charles A. Coffin award in 1950. It is GE's top honor to employees, presented for outstanding achievement.

Mr. Miles joined GE in 1931 after graduating from the University of Nebraska with an electrical engineering degree. Assignment as a design engineer followed, but his "value consciousness" became recognized and in 1938 he was transferred to the purchasing department as a purchasing engineer. His last post before heading up the value analysis program was purchasing agent for GE affiliate, Locke Insulator Corp., Baltimore.

What does a busy executive like Larry Miles do for diversion? "Our home has been the victim," he says. "With my son, I have used 40 truckloads of rock to build decorative retaining walls in our yard. In the winter I go inside to build such features as entire swinging walls, rooms with no furniture, game rooms with a raised hearth fireplace, etc."



Value Analysts Need These Qualifications

1. Background in engineering, plus practical experience in production and/or methods and cost analysis.
2. Creative imagination.
3. High degree of initiative, self-organization and drive to start and follow projects through to completion with little or no supervision.
4. A sense of value.
5. Mature personality, stable and not easily discouraged.
6. Desire and ability to work with others.

have made it worth your while to switch from one to the other and back again.

Design—Here's an area of tremendous potential because of the value analyst's day-in-day-out contact with a variety of products. He also is exchanging ideas with in-plant and supplier personnel. In one case, GE analysts found that a spring it was using had a special hook on one end. With a simple design change in the component, a spring with standard hooks on both ends could be used. Spring cost dropped from 9 to 3 cents per unit.

One big opportunity in this area is to stop high-cost factors in a product before it gets to the production line. A policy of submitting drawings and specifications to the value analyst before a design is frozen will pay dividends. The analyst probably won't catch all the cost reduction possibilities, but a batting average of only 10 per cent is certainly worth-while.

Production—With its ever present "make or buy" considerations, production is a fertile field for the value analyst. An East Coast analyst found that a small plug was being made in his plant on special order because it was a low volume item. It required special machine setup time, as well as time on a machine that could be used to produce something else. Cost: $15 per unit. He found he could buy the part for $3 a unit.

Old, But Good

Standardization, one of the old cost-cutting favorites, is a natural for the value analyst. At Stewart-Warner Corp., Chicago, the standardization program in many ways parallels most value analysis programs. The company's first standardization activity was applied to all purchased items and materials.

Paul Godfrey, standards engineer, found a $185,000 savings by simply revamping steel purchasing practices. He analyzed each type bar, tubing, wire and sheet purchased, asking: 1. Does it fit the general commercial standards as to size, type, grade, etc.? 2. Are we using two or more materials to do the same or nearly the same job?

This table indicates how the number of items purchased was reduced:

	Number of Types	
	Before	After
Carbon bar	230	136
Alloy bar	46	29
Stainless bar	31	15
Carbon tubing	90	57
Low carbon wire	68	35
High carbon wire	61	37
Flat steel	146	42

Result: The number of different steel items purchased decreased from 672 to 351. The $185,000 saving represents direct costs only. Intangibles like inventory, less paper work, etc., are not included.

Suppliers, too, can help you here. Pheoll Mfg. Co., Chicago fastener maker, is pushing a fastener standardization program among its customers. Pheoll engineers studied an appliance maker's fastener requirements and were able to suggest ways to cut the variety of fasteners used from 2000 to 1300. Fastener bill savings: 11 per cent annually.

Campaigning — Pheoll wants to standardize fasteners among its customers and throughout the industry. "Savings," say company officials, "go beyond the price of the fasteners."

1. Purchasing — with the same total, but fewer types, larger orders of each type mean quantity discounts. Overhead is reduced; fewer orders mean less paper work.

2. Inventory—fewer types and sizes save on storage requirements, mean fewer control records and reduced clerical detail, less time in checking and inspecting stock.

3. Production — more general-purpose fasteners increase interchangeability and flexibility. Assembly is simpler, faster. There is

less chance of a production tie-up due to fastener shortages on the line.

Traffic costs are another great potential field for savings. Because of his integration with all departments, the value analyst often can uncover cost-cutting possibilities that the traffic manager might not be able to spot. For example: Several production departments may be ordering different items from the same geographical area. Each specifies a different delivery date which the traffic manager must meet. The analyst, by checking into warehouse facilities, inventory control and production scheduling might find ways to consolidate several shipments to cut costs. Allis-Chalmers did just that in one of its plants and saved $170,000 annually. In the company-wide transportation check, A-C saved over $350,000 on its shipping cost in 1954.

Packaging and materials handling, too, are within the realm of the value analyst. Rheem analysts investigated a packaging project involving corrugated cartons and found a method of saving 15 per cent annually. Another company had been purchasing a chemical in solution. Its value analyst saved $10,000 annually by suggesting that it be bought in powder form.

Suppliers Are Good Allies

The analyst can expect most of his ideas and innovations to originate directly or indirectly from suppliers — if company relations with them are right.

Suppliers are generally specialists—it's only natural that their know-how on specific items is often superior to that of your engineering staff whose primary consideration is the end product. That's why more and more companies, in submitting specifications to suppliers for bids, are asking for suggestions on cost reduction and quality improvement.

A factor frequently overlooked is that suppliers often have a "standard" line of items; that your specifications call for a special. Carrier Corp. was using a tape which the value analyst discovered the supplier was making as a "special." There was a "standard" which would do the job as well or better. Savings from switching to the "standard": $14,000 annually.

To your buyers, a value analyst can provide two important services: 1. He can act as watchdog over price fluctuation between sup-

Here's what the value analyst checks in . . . Make or Buy Considerations

1. Cost studies show it'll be cheaper for us to make it.	Yes	No
2. Making it fits our know-how, equipment and tradition better than it does the supplier's.	Yes	No
3. We have idle capacity to absorb overhead.	Yes	No
4. Design of the part or process is confidential.	Yes	No
5. Making will facilitate our control of parts changes, inventories and deliveries.	Yes	No
6. Do we want to depend on an outside source of supply?	Yes	No
7. Is the volume large enough to justify investment in new equipment to produce the part?	Yes	No
8. Are there major labor implications—would labor rates for production of this item be comparable to rates for our existing products? Will we have to increase our labor force?	Yes	No

Source: Worcester Pressed Steel Co.

pliers. 2. He can supply accurate cost estimates for new models.

Caterpillar Tractor's analysts make quarterly comparisons of costs. When major variances are discovered, the buyer is contacted to determine whether it's a buyer problem or one for the analyst.

Setting Up a Target

At Ford Motor Co., Dearborn, Mich., the purchase analysis department supplies buyers with a cost range on all new models and products coming up for purchase. The buyer tries to purchase the part within that range. If unsuccessful, purchase analysis will review its estimates. If it's sure of them, purchase analysis may join the buyer in getting together with the supplier in an effort to meet the price objective. Often Ford specialists can spot cost-cutting possibilities in the supplier's plant which help him meet the price.

The shoe fits on the other foot, too. A supplier has the opportunity to come to Ford for an economic increase or review if he feels he is losing money on his product. The goal always is to keep prices down, but if a legitimate increase is warranted, the adjustment is made.

Some suppliers have felt that value analysis programs have been a method for the buying company to "look down their throats." Experience proves otherwise. Hobart C. Ramsey, Worthington Corp. chairman, told the National Association of Purchasing Agents in New York: "No company wants to buy below a supplier's costs—he'd be out of business when we need him most."

Think This Over

If you are a supplier, there's food for thought in this quip by a small metalworker who had a worth-while confab with a customer's value analysts: "Where else can you get such high-priced consultants—free!"

Be sure all supplier suggestions are given proper consideration if you have a value analysis program under way. If his suggestion takes a long investigation, give him a progress report. Always make a final report when a decision is made on the suggestion—even if it is turned down. The best way to discourage cost-cutting suggestions from suppliers is to make them feel that you are ignoring the ones they've already submitted.

How big a value analysis program do you need to do an effective job? R. E. Jones, purchasing agent at A. C. Gilbert Co., says: "A value analysis section is a fundamental part of the basic structure of modern purchasing, regardless of the size of the company."

Gilbert has an annual purchasing bill of about $8 million. Its purchasing staff includes a purchasing agent, assistant purchasing agent, two buyers, a value analyst and clerical help. In the last six months, the value analyst's batting average was slightly under 0.500 per cent—explored were 70 major and minor projects; 25 were accepted and resulted in $70.000 annual savings; 21 were rejected; 24 are pending.

Caterpillar's engineering and cost analysis division has eight

people. General Electric has seven key men in its central value analysis group who conduct value analysis training seminars for men in other departments. Among other training factors, supplier personnel are given the opportunity to describe their products and skills. After training, value analysis specialists in units from one to five are put in product departments to provide value analysis services and make specific product studies.

The Navy, which set up a program last year, has a director and an assistant director of value engineering, plus ten civilian engineers. Operating out of the Bureau of Ships Office, Washington, the civilians are divided into two-man teams. They specialize in five phases of engineering dealing directly with shipbuilding. On the job, they work with four and five-man value engineering staffs at Naval shipyards.

The Payoff

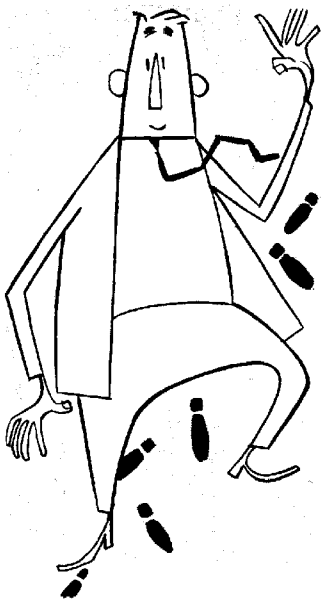
What kind of results can you expect from a value analysis program? As a rule you save $15 for each dollar invested. The Navy estimates its savings at $20 to $1. Most programs are comparatively new and the initial cost reductions appear high. But most officials feel that on the long-range operation, an $8 to $1 ratio will be about standard for an effective and rewarding value analysis program.

Like every other activity in an industrial organization, top management has to be sold. Case histories, plus spectacular savings which usually emerge shortly after a program gets under way, make it fairly easy to get management to agree to "at least give it a try."

Keeping the program sold, not only to top management but to all key personnel involved, is a necessity. Again, this is where "human engineering" comes into play. GE and the Navy have found that there can be no "flag waving" or "glory grabbing" by the value analysts—it's their job to find cost-cutting ideas by assisting engineering, production and purchasing. The Navy's basic policy is that the credit for the savings goes to the line engineer

Allis-Chalmers Uses Committee Approach

Members include representatives from foundry, manufacturing, engineering and purchasing; the chief engineer is chairman. A machine may be torn down to its smallest part to study the function, material used, manufacturing method or purchasing practice for each item. Assignments are made to those in the field where an investigation may fall. Findings are reported, and the committee determines what cost-cutting steps, if any, should be taken. Part of A-C's informal program in value analysis is for the buyers to obtain new quotations daily or set up meetings between suppliers and company officials to discuss new materials, products, methods and specifications. Periodic visits by A-C personnel to suppliers' plants to exchange cost-cutting ideas are also stressed and have proved profitable.



Follow these 6 steps to put . . . value analysis in action

1. INFORMATION . . . Collect all pertinent facts—costs, quantities, vendors, drawings, specifications, manufacturing methods.

Discuss the problem with the engineer to develop a thorough understanding of the product or service involved.

Determine the amount of effort that should be reasonably expended on each item of cost.

2. SPECULATION . . . Generate as many solutions as possible. Consult with others who might help.

Systematically explore materials, processes, rearrangement of parts, etc.

Put your imagination to work; record every solution that seems remotely possible.

3. ANALYSIS . . . Evaluate each idea carefully, sifting out the impractical.

Estimate the dollar value of each idea.

Select the most promising and set up a program to pursue each vigorously to conclusion.

4. PROGRAM PLANNING . . . Break the job down into a progression of functional areas—such as fastening job, support job, electrical contact job, etc.

Select a top specialist in your company to consult on each phase.

Select two or three of the best suppliers in the country for each functional area of the product.

5. EXECUTION . . . Point out the top function desired; discuss the problems and solicit suggestions from company and supplier specialists.

Stick to each promising suggestion until tangible, usable results are reached.

6. SUMMARY AND CONCLUSION . . . Issue a complete, concise summary of the status on each part which shows possibilities.

Send copies to the man designated by the manager to receive and follow up the suggestions.

Complete the job promptly and go to the next.

making the decision to put the cost-cutting suggestion into effect —not the value engineering office.

To develop "value thinking" among all key personnel, GE distributes small thought-stimulating cards describing specific examples of "how value specialists are helping all of us to do our jobs better." Briefly shown are: The description and drawing of the part, what the cost-cutting feature was, total savings, name of assisting supplier source if there was one, where additional information may be secured.

By-Product

A not-to-be-forgotten factor in value analysis programs — they have training potential. Although Caterpillar Tractor's engineering and cost division is not designed as a training program per se, several members have left the division to become buyers.

"What better training could they have had," comments T. M. Logan, who set up the division. "They have gained a knowledge of markets, dealt with suppliers, become better acquainted with processes and materials in their contacts with production men—and they have gained a better understanding of design."

Bigger Billing

Value analysis programs are going to play an increasingly important part in industry, Mr. Logan and most experts in this field predict. There are two big reasons: 1. Industrial organizations are getting more complex. 2. It's getting more difficult for any one individual to keep pace with all the technological developments in his field.

More and more companies are checking value analysis programs to fill the breach. In today's increasing industrial complexity, the distance between the concept of an idea and its adoption as a profit-making application is widening. Because of this, fewer ideas are being developed, claims metalworking management. Value analysis is one answer to the problem.

It's worth investigating.