

Value Analysis

The Measurement of the Values of Materials in Purchasing and Production . . . How It Can Be Done . . . In A Practical Manner . . .

By **L. D. MILES**

*Value Analysis Division, Purchasing Department,
General Electric Company, Schenectady, N. Y.*

ADDRESS BEFORE THE NATIONAL ASSOCIATION OF PURCHASING AGENTS'
THIRTY-FIFTH ANNUAL INTERNATIONAL CONVENTION
CLEVELAND, OHIO



A SUPERVISOR stormed into the office saying, "We've got to have 5000 steel bolts a foot long by Friday." When phoned, the vendor said, "Not a chance in the world," but, "Instead of bolts—if you can use studs with two nuts, we can ship them; and they will cost you 10% less." For making cable reels they were equally suitable. We were "forced" into better value.

1000 cartons didn't come in. An SOS was flashed to our Developmental Packaging Laboratory: "Make up a hundred cartons for tomorrow's shipments." Quickly a design was made up, drop tested, bump tested, and vibrated. It protected its product better than the former carton—and instead of 30¢, cost 20¢. Again we had been pushed into better value.

Small Alnico magnets were used in a control device. The machine for grinding the faces broke down during an urgent demand for controls. Quick

tests proved that for this application performance was equally good without the grinding, and costs dropped 20%. Again we were forced into better value.

Can't Dodge The Challenge

Our Purchasing Vice President, Harry Erlicher, said, "Why do we get into this higher level of value only when we are forced to? There must be a way to mine this gold through a sound, solid, well-planned, organized effort. Lock yourselves up away from the production line and don't come out until you get the answer."

Just about that time the Commercial Department heard about it and brought a device, saying, "There is something wrong here—we have a fine working device—but our competitors are getting the orders—we're selling it at a loss and still they are underselling us. Here, you fellows start on a hard one—we are desperate."

One look at the boss and we knew we couldn't dodge this challenge.

We chose the simplest approach imaginable. "Considering the job each part does, is it worth what it costs?" Studying each part in light of its function and its cost, "It is worth the money?"

This spotlight showed some interesting vistas. A mounting clip was made of high-tin phosphor bronze—no flexing—no current conductivity, still 65¢ per pound. Tinned spring steel would save half.

A small copper tubing 2 feet long had ends of different sizes. Brazed of larger and smaller tubing, it cost \$100,000 for a year's supply. For three weeks we searched — called vendors — solicited their suggestions — then came the answer. By using the larger size only and swaging one end smaller, a year's supply would cost \$60,000 — \$40,000 saved, and performance identical.

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After having become so equipped, we feel that we are prepared to talk intelligently with our prospect. In that way, our approach and solicitation is changed from wishful thinking to an engineer's analysis of economic facts.

The progress of a community, a state or a region depends upon many factors. Aside from material advantages, most important is the spirit of the people—their faith, their will to accomplish things, and their willingness to contribute of their time and mental capacity to do a job. We believe that Alabama is on the march, and that if we all work together earnestly, intelligently and unselfishly, our State will experience a progress and prosperity undreamed of a few years ago.

Thomson-Porcelite Zoning Paint

Full-scale production has been resumed by the Thomson-Porcelite Paint Company on their product Porcelite Traffic Zoning Paint. Practical maintenance men, in competitive tests, have found this to be the longest wearing, most easily applied, and most economical line-marking paint available.

It adheres tenaciously to factory floor, street, parking lot, etc., regardless of the composition of the surface to which applied and holds its color and visibility for a much longer period of time than ordinary marking paints.

Porcelite Traffic Zoning Paint has unusual resistance to stains and scuffing and withstands all types of traffic from the heaviest machine load to plain foot traffic.

It dries hard so quickly that in 20 to 30 minutes after application the heaviest truck can run over lines without the slightest harm to the markings.

Because it gives up to twice the wear of other marking paints, Porcelite eliminates too-frequent repainting, saving valuable manhours and extra, added expense.

One coat, applied by hand or machine, does the job; and for surfaces of creosote block a special non-bleeding primer is available.

For further information write the Industrial Sales Division of the Thomson-Porcelite Paint Company, 330 Race Street, Philadelphia 6, Pa.

Preview of

COMING EVENTS

ANNUAL PICNIC

Cascade Plunge 6:30 P. M. Wednesday, August 16, 1950

D. C. Clark, Chairman of the Entertainment Committee, has announced the Annual Picnic of the Alabama Association will be held at Cascade Plunge, Birmingham, on Wednesday, August 16, 1950. This is one of the outstanding events of the year and everyone is assured of a good time. Chairman Clark and his Committee are hard at work on arrangements and have given warning of some surprises in the program this year.

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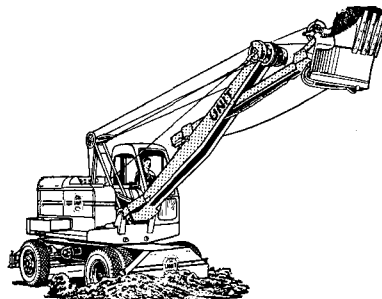
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Inserts going into a plastic case were costing \$20,000 per year. Studies showed they were not worth the money. A saving of \$7,000 per year was effected by the Screw Machine Department.

A small bracket of our own manufacture with tapped holes cost \$10,000 for a year's supply. A specialty vendor, who has developed ingenious techniques for tapping small stampings, automatically, now provides it for \$3,000 — a saving of \$7,000.

Removing Wasted Cost

But, let me tell you the story of a spring. This spring about the size of a cigarette butt, cost \$10,000 for a year's supply. One of our best spring suppliers was invited to bring his top spring engineer and discuss it. The sales manager and the engineer were given samples, given its specifications, were completely informed on the operation of the device and told to suggest for our engineering consideration a spring which would fit in the space and do the job. They were told that we recognized them as foremost spring authorities better qualified than ourselves to prescribe the exact spring which would bring identical performance with the best value in this application. A month later they turned in one of the most beautiful jobs I have ever seen, five different sets of samples, each with a complete specification and set of test data. We took it up to the engineer's office and, as we put it on his table and he saw its thoroughness, he said, "I could only wish that we could have such complete information on which to base all of our decisions." Ground ends — music wire instead of spring steel — special plating — tolerances closer than actually needed — each made their impact on cost increasing it from 1/5¢ to 1¢. After the completion of tests, he selected a spring which would do an identical job and instead of \$10,000 for a year's supply, it now costs \$3,000. Again "wasted" cost had been eliminated.

We were finding that again and again and again Purchasing can remove this "wasted" cost. If Purchasing doesn't — it won't come out.

Creative Study of Value

We call this intense, concentrated, orderly search: "Value Analysis." It is a well-informed creative study of every

item of cost — every part or material in view of other possible materials, newer processes, possible new designs, and the abilities of specialized suppliers — to determine whether every item represents ultimate value.

First is the determination that Value is Purchasing's business on every front in the Company. Not one dollar of wasted cost, not a dollar spent, without a dollar's value—or Purchasing has not squared up to its responsibility.

Second is the determination that in

every part lies greater value. It is there—it is available—if we haven't found it, we simply haven't done the job.

Next the spotlight was turned onto a control. Does every dollar, does every penny, of cost deliver performance?

First, a nameplate half the size of a playing card, red, white and black, costing 5¢. Does it add 5¢ to the value? Appearance is important—is possibly the most difficult cost factor to evaluate.



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"Trade With Arnold-Brown Where Your Orders Are Appreciated"

The stylist found that the control was normally not exposed to view, so a monogram is now molded into the plastic cover and the 5¢ wasted cost is gone.

Holding on the cover is a plated brass screw costing double that of plated steel and performing no better. Inside are a dozen special binding screws, each costing three times the standard screw price. There was a reason for it — yes — but the reason could be eliminated by a tool change paid for out of two months' savings.

Instead of a special resistor, Purchasing located a standard providing identical performance at half the cost.

Instead of ordering individual parts, ordering one sub-assembly cut cost 20%. Again Purchasing impact was felt — for Value improvement in the product.

Value Analysis work is by no means a substitution for the effective cost reduction and value improvement work being done throughout every company. It is instead an added facility, another tool to make the company's work far more effective. The Purchasing Value Analyst must bring new information and new possibilities into the Company. Specialty suppliers must be searched out, the problems outlined to them and their facilities and abilities must register impact against "wasted" cost.

Ingenuity of Suppliers

Such results can be accomplished in a Purchasing Department by technically solid, qualified purchasing men trained in the techniques for developing and utilizing new ideas — new ideas from within the company and from without — and new facilities of specializing suppliers who have developed an extreme degree of ingenuity in their own fields.

The answer, "NO!" is the beginning of a Purchasing Value Analysis project — not the end.

There can be no artificial stopping lines drawn. Whether for purchased material or purchased part or operation in the factory, the simple questions, "Does it represent value? Is it worth the money?" must be asked and correctly answered of every element of cost. *Without exception*, every element of cost must be evaluated considering both its addition to the function of the

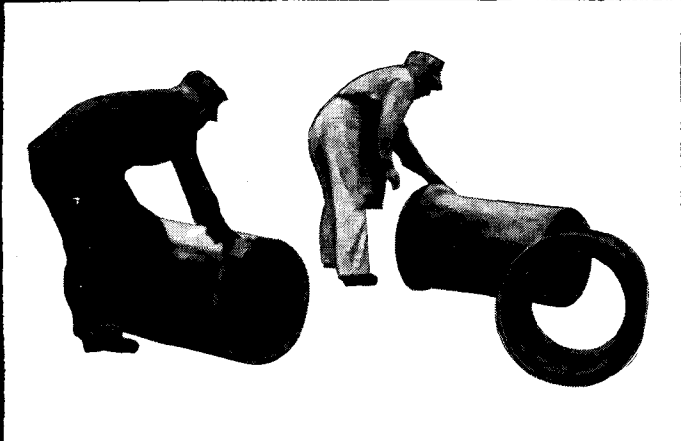
device and other probable means for securing the same result.

To identify value or more precisely to measure its absence, a basic thought is essential. Value is not necessarily determined by the steel or the wood or the rubber plus labor and overhead and profit that go into the product. That is the floor under cost. The value of a lead pencil is not determined by the wood and the lead, the labor, overhead and profit, but rather by the answer to one question, "What would it cost for something else to write as well?" Value,

then, is not so much measured by what is in a part or a product, but rather by what else, possibly entirely different in nature will perform the intended functions with equal reliability and—what is its cost?

Is It Sound Business?

The Purchasing Agent who receives a drawing and is told, "Here — buy this" has a difficult job of getting value. In the first place—seeing only the one design—the one part—he has no way to know or to determine its



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value; and secondly, his suppliers are in the same uninformed position.

In fact, just last month our own Motor Sales Manager said, "We could save our customers a barrel of money if they would let us study the application and recommend exactly the right motor for the job. We have fifteen men who have *lived with* motor applications from five to twenty-five years; but too often orders come in specifying a certain motor and they don't have a chance to help save the user money."

It's a strange business—ours—when, in order to measure value, we almost literally study everything but the subject.

The Value of the morning grapefruit is not established by "how many vitamins" or "how far does it squirt"—but "How does its taste compare and how does its cost compare with other foods having similar food elements."

Seeing clearly the nature of our job—"Measuring and Securing Value"—we Purchasing Agents can set up to accomplish it.

A Study of Each Item

The Value Analysis injection of Value improvement is possible only by management's realization of the impact which can be delivered against important classes of "waste cost" by a two-fisted, hard-slugging, broad-based Purchasing organization.

While startling results are shown and, in fact, often accomplished, and individual cases of Value improvement may afterwards appear almost like magic—Value Analysis is distinctly not hocus pocus. It is planned, organized, hard work along definite lines using definite methods with definite objectives.

On each project all the facts must be at hand, all material costs, all labor costs, all overhead, planning and operation sheets showing every operation and its cost. This complete cost build-up is absolutely essential. Then each item of cost is intensely studied in relation to the contribution it makes toward the performance of the device. For example; can we —

Eliminate the part—change over to another to perform its function?

Simplify it—Put all tapped holes in

one part — eliminate them from others?

Challenge each feature which causes secondary operations?
Etc.

Alter it — so that a high-speed method can be used?

—so that a standard or a vendor's near standard can be used?

Use a lower-cost material — which will perform equally well?

Use a higher-cost material — which by nature and properties will afford a simplified design and lower cost product?

Check it against other methods of fabrication?

Check unusual but available forms of raw material—preplated steel, clad metals, etc.

Survey the Purchasing with the buyer—Are the available highly specialized suppliers being used?

Have the suppliers' engineers been given sufficient facts and pressed for suggestions which would produce equivalent performance at lower cost?

Should some minor changes suggested by the supplier which afford lower cost material, be considered further?

Has the buyer found the basic source—the manufacturer who may be in a position to extend the minimum price.

The Value Analysis man, except in his own realm of purchasing, *must never have authority*. To assure smooth operation he should make certain that both Engineering and Manufacturing know he claims no authority, only the responsibility of digging out, developing and setting forth possibilities associated with the dollar sign, whether they be in Engineering, in Manufacturing or in Purchasing. The Purchasing Value Analysis man must be the defense attorney whose primary job it is to insist upon and to defend value on every front, but his job is one of leadership — he leaves the judicial where it properly belongs. The decisions will be made by the engineer or the manufacturing man or the buyer.

How to Measure Value

Until we can measure Value as accurately as the engineers measure volts or watts, we are stumbling in the dawn. We have only started — but several hundred cases of Value Improvement have been classified and studied, with these resulting "10 Measurements of Value" which will help to point out loss of Value in 99 out of 100 cases.

1. Does its use contribute Value?

A nameplate adds 5¢ to cost but being mounted under a cover adds little to Value. Put a monogram on the molded cover and save the wasted cost.

2. Is its cost proportionate to its usefulness?

For the simple function of transmitting a small amount of mechanical motion from a quartz member to the relay, 17¢ is an impropportionate cost. Do the job for 2¢ and Value is gained.

3. Does it need all of its features?

Grinding the ends of a spring may cost five times as much as winding. Eliminate the grinding unless it makes a contribution to Value.

4. Is there anything better for the intended use?

A spacer made from a steel rod undercut to reduce weight costs 90¢. The spacer made from an aluminum disk is even lighter—cost 20¢.

5. Can a usable part be made by a lower cost method?

A pawl costs 50¢. It was changed to cost 10¢; identical performance resulted.

6. Can a standard product be found which will be usable?

A small nut costs 18½¢. No standard could be used because of nut corner interference with an adjacent part. During the Purchasing search, a specialty supplier who marketed a list of non-standards was located and a part giving identical performance could be purchased for ¼¢.

7. Is it made on proper tooling — considering quantities used?

Designed when smaller production was expected, a stainless weld nipple was made by purchasing a standard fitting and machining away part of it at a cost of 20¢. However, with present quantities of 12,000 a year the weld nipple should be made on a screw machine for 5¢.

8. Do material, reasonable labor, overhead and profit total its cost?

3¢-worth of steel rod with the ends turned, no close tolerances—still a cost of \$1.07. Certainly it is not a reasonable cost. Considering the material, labor, overhead and reasonable profit, it is worth about 20¢.

9. Will another dependable supplier provide it for less?

The question which is of everyday importance to all of our buyers. Give the right vendor the right ordering quantities and the cost of gaskets drops from \$10 per M to \$7 per M.

10. Is anyone buying it for less?

A little time spent in deep thought. Who else uses this type of material? How is he providing it? What possible means is he using to improve value?

Conclusion

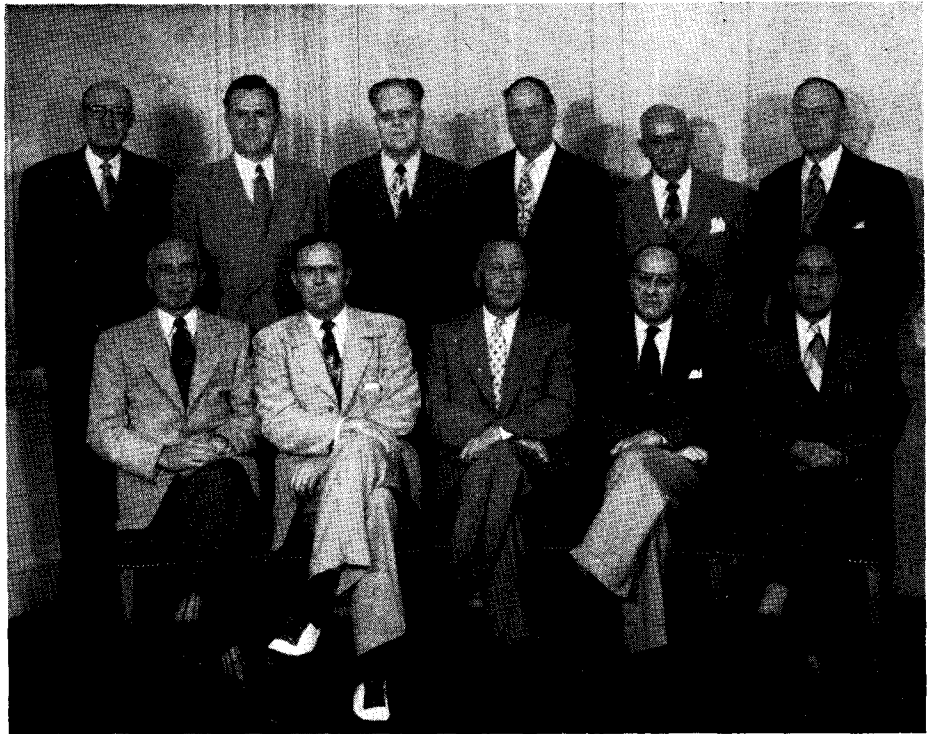
For one thousand years the American Indians roamed in the prairies of this—one of the richest and most fertile lands—naked savages—because they lacked an idea. For three thousand years goods and appointments for comfortable living have been in use, but, because of high production costs have been available to few.

Today and tomorrow we will have no shortage of ideas—no prolonged shortage of goods for finer living. But, today, as in the age of the Pharaohs, production cost will determine:

The roofs over our heads and the shoes under our feet.

The comforts our old folks enjoy and the books our young folks read.

There is no limit to the dividends in human comfort and in human improvement, through more goods improved in quality, lowered in cost, and constantly made available to more and



NEW N.A.P.A. EXECUTIVE COMMITTEE

Standing, left to right: Sam H. Harper, The Pure Oil Company, Houston, Texas; Chester F. Ogden, The Detroit Edison Company, Detroit, Michigan; Stanley E. Ringheim, Crown Zellerbach Corp., Seattle, Wash.; O. L. Williamson, Merrill-Stevens Dry Dock & Repair Co., Jacksonville, Florida; Matt Shields, Gustin-Bacon Manufacturing Co., Kansas City, Mo.; J. Herbert Gaston, City Purchasing Agent, Baltimore, Maryland. Seated: William R. Murray, Bigelow-Sanford Carpet Company, Inc., Thompsonville, Conn.; Bruce D. Henderson, Westinghouse Electric Corporation, Pittsburgh, Pa.; H. F. Jones, (New President) E. J. du Pont de Nemours & Company, Wilmington, Del.; T. A. Corcoran (Past President), The Courier-Journal—The Louisville Times, Louisville, Ky.; Harvey T. Sprang, Frankel Brothers Limited, Toronto, Ont., Canada.

more Americans by purchasing men of vision, who recognize their challenge to improve value and register the full impact of their organizations for value enrichment.

LINE MATERIAL COMPANY OPENS NEW PLANT

The Southern plant of the Line Material Company at 1700 Vanderbilt Road held open house on Saturday, June 24, 1950. The new and modern plant was in operation and guests were taken on guided tours throughout the afternoon. Buffet lunch and refreshments were served.

Line Material Company, a division of McGraw Electric Company, operates other plants in Milwaukee, Wisconsin, Barton, Wisconsin, Zaneville, Ohio, Kansas City, Missouri, East Stroudsburg, Pennsylvania, Oneida, New York and Toronto, Canada. Their Birmingham operation is the only pole line hardware manufacturing plant in the South.

M. L. Ruggieri is Manager of the Birmingham plant.

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