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VALUE ANALYSIS IN PURCHASING IS KNOWING AND BUYING FUNCTION

The essence of all Value Analysis Technique is securing proper function for proper cost. In Engineering, it is to secure proper function for proper cost by design. In manufacturing, it is to secure proper function for proper cost by manufacturing. In purchasing, it is to secure proper function for proper cost my buying. How the buyer learns function, how he buys funct ion, and the surprising benefits to the business when he does so will be sho

For the skeptic, a truth which will later become self evident, is set for Important bits of knowledge, to which none other than the buyer has ready ac ess often, if pursued by the buyer, bring large dollar benefits.

To achieve these benefits the buyer will determine that, "I will not pay out my employers money without knowing that it is bringing in needed functio at proper cost. He will follow this up with three steps.

1. He will learn the function needed from each expenditure.

2. He will learn the proper cost for that function.

3. He will buy it for near the proper cost.

To achieve these he will learn and use the techniques required to know needed function. He will also learn and use the techniques required in orde

to know appropriate cost and to secure proper cost. He will receive, first opposition, then plaudits. Opposition, because he is doing somet hing othe than, judged from his past, was expected by his associates. Plaudits becaus the increased earnings and benefits speak for themselves, and, by then, his associates have come to expect his extra involvement and extra contribution.

The VA trained buyer knows that not all materials specified are exactly right. Not all dimensions, shapes, compositions, fabrications etc are specified exactly right. Not all current knowledge was completely known by the specifier. Not all tests have been interpreted exactly right. Not all person influencing the materials or services or equipment which he is buying were fully and currently informed. That is normal, par for the course. But the real dollar benefits come when better than normal, better than par work is d The VA approaches, consistently used by the buyer, will achieve that.

Four steps, know the function, buy the function, know the value (proper cost) of the function, and buy it near its value will be illustrated.

The requisition called for 60 pieces of coiled copper bus, $\frac{1}{2}$" x 2" in cross section and 300' long. The items had been used before and presented no buyi problem. Delivery was to be scheduled thruout several months.The buyer asked

what function? The reply was that the copper was insulated and wound into coils for use in hydro-electric generators. The buyer knew that only 12 generators were being built and had noted an extensive brazing operation ir the factory. He asked the function of the brazing operation. Five pieces were req uired in one length for each winding. Four brazed joints made each 1500' winding. These brazed joints were right in the electric circuit and required much precision workmanship, and added much cost. The buyer reasone that all of that cost brought no function, if he could obtain 1500' lengths from the supplier.

The handbook however showed that 300' was the maximum length obtainable, in that size. Using the "Do it" techniques he learned in VA training, he asked the engineer if it would cause any problems, if he should bring it int the factory in 1500' lengths. He said "No, it would be superior", but added we looked into that and found that 300' was the longest length obtainable". The buyer then asked the manufacturing engineer if it would cause him any fabrication problems to secure the copper in 1500' lengths. He said, "Certair not, it would be excellent, that brazing work is extremely critical and cost but, he repeated, we've looked into that and found that 300' is the longest ler obtainable". The buyer then saw that all of the money paid for the functior

by brazing was for a function worth zero, if he could get the 1500' pieces.

He went to the copper bus source,saw continuous bus being cut into 300' or shorter lengths, asked to have a 1500' length run, saw it coiled neatly on a skid ready for shipment.

A week later it was in the buyers factory,eliminating non-functioning cos in nearly every area. The supplier liked the method so well that he lowered the price of copper taken in that form. Manufacturing was simplified, tens of thousands of dollars of cost were turned into earnings, and the product was slightly improved.

This example illustrates a normal situation. Responsible people - the engineering manager and the manufacturing manager - had accepted as real truth, the premise that 300' was the maximum length obtainable and would continue to accept costs on that basis. The president doesnt know enough details of supply or manufacture to constructively question it. The buyer is in a key position to bring benefits to all. When he identifys and evaluates functions and pays only their value for them, he brings a great new asset into the business. The essential four steps are reviewed:

1. Know and understand the function brought by each dollar spent.
2. Buy function.
3. Learn and know the value of the function (its proper cost).
4. Use sufficient initiative and creativity to buy the function for its va

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HOW DOES THE BUYER KNOW AND BUY FUNCTION?

First, the buyer must know and believe the overwhelming benefits to his employer which will come, if he can know, understand and buy functions. Second, if he has not already done so, he will learn enough basic knowledge about Value Analysis methods so that he knows how to handle functions. Then he asks questions. He looks. He reads. He listens. He reasons. He starts. Soon, some unexpected benefits will show up. He makes the most of them. More people help him. More people welcome him. He continues knowing more and mc about the functions of what he buys. There is nearly always someone who war to keep all of the quality, and to do it for less cash outlay. The buyer wil search him out - and get onto his team - and get started. An example will illustrate.

Among other items the buyer bought materials and parts for an appliance control. Quantities were 2,000,000/year. The engineer told him,"we're losing sales position in the market. Our costs are so high that we can't sell competitively. We've got to have your help". He said,"You buy many parts for it bellows,a capillary tubing, some contacts, some springs, some screw machir

parts, a plastic enclosure, and others. We must have lower prices".

The buyer told him to,"Put it into function language and I'll go to work on it". He did. There were 6 functions. 1.Sense temperature. 2.Actuate contacts. 3.Interrupt circuit. 4. Provide Adjustment. 5.Mount and protect. 6. Please customer. Now, the buyer told him, "Provide to me three essential more/bits of knowledge". 1. What is each of the six functions costing now, which will give the over-all total cost. 2. What overall cost do you believe you need to become competitive and profitable? 3. Divide that over-all cost up among the 6 functions in a way that makes sense to you, considering the state of the art, and the probabilities which you consider reasonable."

The following functional knowledge was provided to the buyer.

Functions that must be performed	Present cost	Required cost
1. Sense temperature	$1.00	$0.60
2. Actuate contacts	1.50	0.80
3. Interrupt circuit	1.00	0.50
4. Provide adjustment	1.00	1.00
5. Mount and protect	4.00	2.00
6. Please customer	0.50	0.10
Total cost	$9.00	$5.00*

The buyer now used his special expertise - knowledge of what is availabl from suppliers. He selected between one and three for each of the first five functions. Of course he gave them no costs. He gave them a sample of t product, told them the quantities, and gave them as much function requireme information as was available. He told each that if they made an important

contribution, they would receive important business.

Function 1."Sense temperature" required a means of getting temperatures from a suitable place inside of the refrigerator, communicating that information to a convenient place for the control, inside of the refrigerator, ar somehow causing action to open and close electrical contacts which would tu the machine off and on. It was now done by a phosphur bronze bellows in t control, which was connected by a 1/8" copper tube, 2' long to a bulb 1/4" diameter x 4" long which was suitably located inside the refrigerator.

The buyer divided function 1 into three functions and scored a great succes

Function 1a - Provide some useful change with temperature in the 35° to 45° range, now provided by a gas contained in the bulb.

Function 1b usefully communicate that change 24". Now a 1/8" dia copper tu

Function 1c react to the change with mechanical movement. Now a bellows.

For function 1a the buyer selected three suppliers who seemed to lead th industry in gasses with specialized properties, gave them the story, asked them to study the possibilities and make their offers. They studied the ap ication. The proposal used is shown below.

For function 1b, the buyer selected two fabricators of similar items,who had shown ingenuity and competence based upon excellent knowhow and equipme

For function 1c he selected two fabricators of specialized miniature instrument parts, gave them the whole functional picture and the challenge.

Offerings to accomplish the functions, together with descriptions of the material which would do so, and quotations were provided to the buyer. Below are the results selected for function 1.

A gas manufacturing Co. provided a gas which changed its pressure/volume relationships much more rapidly in the 35 to 45 degree range than the present gas. This made big improvements possible in 1b and 1c which greatly reduced the amount of gas needed for function 1a.

Function 1b which required a 1/8" copper tubing with a bulb, became a 1/1(copper tubing with no bulb. Saved was all of the additional copper and the brazing on of the bulb.

Function 1c became an ingenious and reliable miniature hollow "button" wi a snap diaphram. It was much more sensitive than the previous bellows, and operated reliably on very, very much less gas, making the large savings in the previous items 1a and 1b practical.

As compared to the present cost of $1.00 and the target function cost of the cost of the function now became 50¢.

The benefits, when buyers do unusual work are often startling, In case of t one function alone - a million dollars of benefit.

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ONLY TWO KINDS OF FUNCTION - "USE" AND "AESTHETIC"

It isnt always easy to agree just what function is wanted, especially whe some Aesthetic function is involved. One evening while speaking to the Engineers Club of Nevada, on their ladies night, I was next to a very sparkling and attractive wife of the club president. Glancing about for a way to illustrate USE function and AESTHETIC function, I saw a light bulb.

"There's a USE function," I said. "No matter how it looks or feels, or its shape or color, we buy it to give light, and to do so efficiently and economically". They gave me no argument. Then I asked about the ash tray. "Is its function ~~to~~ hold ashes the only function it has"? They fairly burst forth "No, It must look and feel the way I want it to, it must have aesthetic "Alright, then it must have aesthetic function too - and proper aesthetic function is just as important as proper use function," I said. "Lets name it PLEASE CUSTOMER". So far so good, then I got into deep trouble.

To illustrate expenditures that brought no use function at all, only aesthetic, I asked the wife of the president to stand. I touched a beautiful ear pendant, saying, "this is an example of 100% aesthetic function. no use funct

With almost one voice they said, No! No! No!, it also has use function. Somewhat startled, I said,"What function"? They answered,"to get our husbands Nonplussed, I said, "Nonsense, you already have your husbands". But that did stand up long. They flashed right back "To keep our husbands".

So lets see how we're progressing in our study of"how to" buy functions.

1. We have developed a "feel" that the money we spend is always for some func
2. Also, as we deepen our understanding of specific functions,we aquire knowledge which is essential to good buying.
3. We have learned that,as we gain this knowledge,we become more able to use our professional purchasing skills to advantageously buy function.
4. We have learned that, as we buy function, important amounts of un-needed non contributing costs are ended.
5. We have learned how to communicate,in function language,with our potential suppliers, and how to maximize the benefits to us from their capabilities.

We have not yet learned exactlyhow to:

1. Reduce 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 functions.

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

That will follow. Today we'll go a little further with the buyer as he buys the function "interrupt current" for the temperature control we examined last month. This was accomplished by a silver contact surface and its mounti Its cost was $22.00/thousand which is $22,000/year for the million needed. Basically, the silver is the high cost and the high function material, he rea sons. "I want all of the silver I buy to be so shaped and so used that I get function from all of it."

This caused the buyer to increase his knowledge by having an hour with the product engineer, learning the exact function of the silver he was to buy. He learned that, in general, each time a contact is opened while electric current is flowing,a little of the contact metal is eroded away - vaporized. To minimize this, a material which is a superior heat conductor is used - usually silver, at the exact point where the contacts break open. The amount of contac erosion, at the point of opening depends upon the amount of current, whether it is ac or dc,the amount of inductance(coiled wire) in the circuit, the speed of the opening and a few other variables. Much data exists so that it is prac

tical to plot curves showing the number of openings, under the differing conditions, to be expected from a particular amount of silver. Knowledgeable people in that industry, have that data.

Instead of just requesting quotations on the contacts, as drawn, the buyer selected three leaders in that business. He provided to them the functio data. How many maximum openings, with how much electric current of what type, in what type of circuit and under what other conditions during the longest possible life of the equipment? How large were the continuing quantities of usage, etc.? He also provided to them, samples of the contacts now being used and told them that it was the program to achieve all of the usable life, safety factor and quality, but to stop buying non-functioning silver which existed in the present design. Visual examination showed that not more than 1/10 of the silver on the present contacts could possibly come into contact and thus function.

PURCHASING ACTIONS BROUGHT VENDOR CONTRIBUTIONS TO EARNINGS

One vendor advised that he would perform the manufacturing, brazing, coinin etc., of the metals which made up the contact assemblies while ~~while~~ the materials were in strip form, then cut them off into individual pieces in the final operation. During this shaping and coining, a shape would be provided

which would allow a much larger percentage of the silver to come into active position as contact "wear" progressed. Enough of the un-functioning silver was eliminated, in conjunction with other manufacturing benefits so that the cost became half, $11.00/thousand instead of $22.00. Again, the buyer bought function, got all of the quality, and added almost $1000/month to earnings.

Next month an illustration of buying aesthetic function will be included.

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HOW THE BUYER CONTRIBUTES MORE EARNINGS

Like the snowball that grows as it rolls , the buyer who decides he will get knowledge of function and contribute more to earnings, finds added earnings / increasingly achievable. Before we have an experience of buying aesthetic function, it is timely to relate a follow-on experience of the buyer who/in las months example spent the energy to learn how electric contacts function, and added earnings of $1,000/month on just one item.

KNOWLEDGE, ONCE GAINED BY THE BUYER, IS USEFUL ALWAYS

Casual examination of the contacts in another product startled him. Altho in its performance it operated very seldomly, and under controlled condition it contained what seemed to be excessive amounts of silver. Studying the fun ion, he found the opening and closing action would occur a maximum of 1000 times per year. 100 years would be 100,000 times. The data he had showed that there was enough silver in place to operate several million times.- meaning a life of several dozen centuries.

He discussed his belief with the product engineer who listened, considere and agreed. A two pronged program was started by them.

1. The buyer submitted mechanical data about the equipment, and functional

performance requirements data about the contacts to his vendors, asking for their recommendation and quotation.

2. The engineer started an investigation with the laboratory to determine why the design included so much silver.

Quotation and suggested design from the vendors showed a reduction in yea cost of $26,000 - over $2000 of added earnings every month, if they could be used. It all depended upon the engineer's findings and his decisions. What he found was costly truth as strange as fiction. During design work, reasonabl and appropriate contacts, developed by theory and test had been selected. However, during the assembly of the samples to be sent to the Underwriters Laboratories for approval, some manufacturing mistakes were made and the available contacts were destroyed. The then engineer was called upon for more contacts. Having no more of them on hand, and much desiring to avoi delays, he provided available contacts from another equipment to the assemble The assemblies were completed, sent to UL, approved, and went into production Of course it then must use the approved components. Nothing more was noted, or done until the buyer in"buying function" took the first steps which result in identifying the $26,000. as non-function costs. New samples were made,submitted to UL,approved, and used and the $26,000/yr became added earnings.

THE BUYER CAN UNDERSTAND AND BUY AESTHETIC FUNCTION

"No we cant", said one senior buyer,"aesthetic function is totally subject ive, varies from one person to another, from one time to another etc. To att atch a dollar value, or appropriate cost to it, as we would to USE functions which can be spelled out by exact science, is impossible".

For a moment, we'll study the exact nature of aesthetic functions,then we will have an example of buying them. One name which seems to realistically fit all aesthetic functions is to "please the customer". Then the task is to spell out just what will please and determine what they are willin to pay for that. Difficult? Yes. But in difficulty often lies the greatest profits. Most aesthetic functions please the customer by providing: shape, appearance,color,features,convenience,"feel", or reducing: noise,size, time or skill required,or similar. The aesthetic functions requiring cost, are fully identified and clarified, as are the use functions. Then the present or planned extra cost of providing the aesthetic function is carefully determined - always separating its elements from from costs which also bring use functions. Next is the buyers opportunity to determine alternate ways and associated costs for providing those aesthetic functions. Of course, as with

use functions, the person informed and skilled in aesthetic functions is provided all information so that he can decide if, indeed, there is real aesthetic function purchased by the added cost.

Example. The refrigerator temperature control recently discussed,had a knob for user adjustment. On this knob was a small metal arrow containing a red dart. This small metal part with color cost 2¢ each. 2,000,000/yr cost $40,000. It had a use function - cover a mounting screw, and an aesthet function - please the customer. The buyer separated the costs of each type o function by securing quotations on a small stainless steel part to cover the screw. The cost was ½¢ or $10,000/yr. Now he knew that the aesthetic functic - the red dart was costing $30,000/yr. He noted that because of the red dart he was restricted in selecting suppliers to makers of "nameplates".

His next step was to provide this cost knowledge to the industrial designer whose talent, training and experience qualified him to make decisions concerning aesthetics. To provide good data for the aesthetic decision maker he got a handfull of samples of the ½¢ stainless arrows. They were made of pre-polished stainless, and were in fact quite attractive.

The industrial designer was immediately pleased with the highly polished stainless pointers. He said,"Actually the red dart is not good,makes the pro resemble a toy. Take off the color. Add the $30,000/yr to earnings".

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Value Analysis
Buying Techniques

DONT BE STOPPED

The range of" stopability"is said to be 100 to 1, in differing people. Its true. I've experienced it in buyers, and in others. The purpose of the VA approaches is to increase the effectiveness of people, in our case the buyer. When the buyer has learned how to make a larger contribution to the business - by understanding and buying function - then his effectiveness is at once limited by his"stopability".

Since this is real and since it limits the effectiveness of people, in VA principles we face it,name it,study it, recognize it, and by technique and training, endeavor to modify it. This stopability quotient in most individuals is far too low. It limits their effectiveness drastically.

Example of "It Cant Be Done"

Having arranged for the clubhouse on a nearby golf course for a VA training seminar,I instructed one of the prospective trainees,who was assigned to help with arrangements,to determine what will be involved to provide the full time use of two more telephones in the location for three weeks. He returned,saying "It cant be done, they dont have the lines". That startled me. It was as though he had not listened to the instructions for the task - to determine what was

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INFORMATION USED ONLY FROM THE BEST SOURCE

When is it mis-information, and when is it usable profitable knowledge?

ONLY Information From the BEST Source is Useful KNOWLEDGE

The buyer must have knowledge. He must know facts - truths. He will ask questions. He must get truths for answers. To understand true function so that he can buy profitably, he will search for knowledge with questions like Why is this square? Why is it painted red? Why does it have double contacts? Why is there a .0001" tolerance on the diameter? How does the customer moun the base? In what positions can it be mounted? At what atmospheric conditions will it work? What causes it to be noisy?

To every question he will get an answer. Those answers will be, 1. exactl correct, or 2. partly correct, or 3. wholly wrong. The value of the answer depends upon the knowledge of the person giving the answers. It sounds simp but it is'nt. Experience shows that answers are apt to come from persons having only part of the knowledge or incorrect information, or obsolete info rmation. Persons who are more verbal than the person with the real facts will too often at once volunteer half-correct or plausible sounding wrong information. To use this is to leave achievable benefits lying un-used on th table

Example -"We Cant Increase Production,We're Using Every Pound of Steel We Can Get".

At a top management planning meeting of an appliance manufacturer, the president said, "We are very much in a sellers market, it appears that we could sell whatever we could make." He questioned the manufacturing manage "could you double the production rate of ranges?" He answered yes. The president then asked the marketing vice pres., "could you sell twice as many range He answered, "yes, that would be no problem, but we cannot increase our pro- duction because we cannot get the steel. We are using every pound of steel obtainable now. Purchasing is hard pressed to prevent interruption of our present rate". The president said,"then it appears that we can not now take advantage of this strong demand, because of steel shortage, we'll continue we are." The finance vice-pres. now entered the dialog and with this tech- nique, rescued the situation. He said,"I saw an announcement a short time ag that we now have a Materials Manager. It must be his function to enter cases of need for materials and use his skills. We need the earnings which would come from doubling the range production rate, very much. If we're scratchi the increase because of material shortage, it seems to me we should call hi and see what he says about it". He was called in and appraised of the situ

Example, Engineering manager said "It Has No Function, But the Customer Requires It".

In a moderate-sized piece of electrical equipment, a partial inside cover was found that cost $5. The buyer could find no function for it. Accordingly, in reporting to the engineer in charge, he said, "This cover costs $5 and I can find no function for it." The engineer immediately answered, "It has no function, but the customers require it." The buyer at once recognized this as quite a normal situation, in which the engineer voiced his belief; in fact, he voiced the criterion on which the decision to retain this cover had been made for years. The buyer's suggestion was "Why don't we ask the sales manager why it is that the customers require this cover since it seems to us to have no function?" When the question was put to the sales manager, his answer was: "Does that cost $5? Take it off. I have only one customer who uses it. The others take it off and throw it away. I will see that this customer pays a special charge for extra equipment."

When the answer came from the BEST instead of the near-best source, it allowed the buyer to make a big movement toward improved earnings.

Example, "There's No Other Source"

A special instrument required a glass cover about 10 in. in diameter having a curved shape similar to a cereal bowl and having a ¼-in. hole through it. Quantities would be 20,000 per year. Cost was $1.25 each. As it went from the laboratory into production, the laboratory buyer told the production buyer, "That is a tricky part. I made extensive search and finally found and developed a supplier who could and would make it right. There is no other supplier." The factory buyer believed that he could find a better source of information. He asked the buyer at a clock factory, who habitually bought various sizes and shapes of clock faces, about it. ~~The reply was, "We have six excellent suppliers for that type of item; send six sets of specifications."~~ The result was a proven supplier of high quality materials who charged 50¢ instead of $1.25.

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FIRST - GET MORE KNOWLEDGE

"I can't use Value Analysis principles on all of my buying",a buyer who had just received training and returned to his plant, said. "Why not?" I aske "Because some important items are tricky. The job is to get something that w then we don't dare touch it". I said, "Pick one,lets talk about it". He di

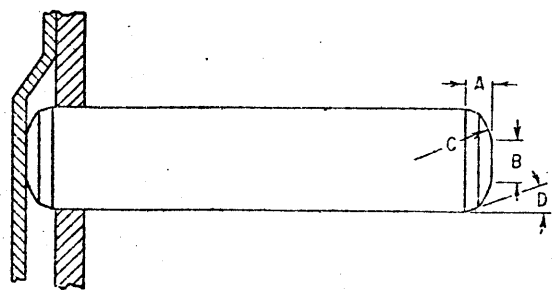
A purchased item, enormous quantities, 50,000,000 per year tiny stainl steel pins were at the heart of their product. Tolerances on length,diamete chamfer and end flats were microscopic. Cost was $3.65/M, $182,000./yr. Annual cost was enough so that even a "hard" one was worth looking in to. He said he would try it. I asked him exactly which principles he would try to u He said,"Pay out no money which didnt bring useful function".

"Determine the functions needed and those being bought".

"Learn the amount of cost which went into each function".

"Go on from there. Try to end costs which didnt buy useful functions and minimize costs which did."

The pin, greatly enlarged, is shown.



Specifications

Length - .354 ± .002"
Dia. - 1/16" ± .00025"
Chamfer - 20 degrees plus radi of .089",then a flat not in excess of .050" diameter.
Material - 440 Stainless,harde
~~Quantity - 50,000,000/year~~

He told the supplier company's sales manager about the function buying principles and asked him to have his technical and manufacturing people revie the materials and proceedures used, to identify non-functioning costs, if any, and hopefully quote a lower price. A two-page answer said all was efficient and the best possible, and that a higher price would be required soon.

The Buyer Got Knowledge

He went to the supplier's plant, where he could always reach the person who knew, with each of his questions. The way the buyer can develop vital knowledge, which hitherto has not been used to his companies advantage, is illustrated .

(1) What purpose does the pin serve? It is the pivot used to support gears in an electric clock.
(2) How is the gear put on the pin? Pressed on.
(3) Why is stainless used? To avoid corrosion.
(4) Why use No. 440 stainless, which is twice as hard to machine as the others? Because it has 100 points of carbon and can be satisfactorily hardened.
(5) Why harden it? In pressing on the tight gears, the surface of the pin is sometimes slightly scored, and as this surface serves as a bearing surface, the scoring would result in erratic and short life. The sole function of the hardening is to avoid damage to the pin surface.
(6) If the gears are carbon steel and do not corrode or rust, why should the pins? We tried carbon steel for the pins and it does corrode. The gears are made of a very thin cold-rolled steel, and it seems probable that the supplier uses some rust inhibitor in his process that is good enough. If we thoroughly clean the gear steel by acid or other method, it too will rust.
(7) Why the chamfer? To provide entry into the gear.

(8) Why chamfer both ends? To save labor. Otherwise each pin must be picked up and examined before it is located with the proper end up.

(9) Why the flat? The flat presses against the end plate and locates the pin axially. It is desirable for the flat surface to be at a minimum in order to reduce end friction.

(10) Why the radius? The radius is for the purpose of connecting the chamfer to the flat.

(11) Why have both the chamfer and the radius when the combined length of both is 0.010 inch and may, within tolerances, be as little as 0.005 inch? A chamfer or suitable radius is necessary to provide entry into the gear, and a small end bearing surface is necessary to limit end friction.

(12) How much does the stainless wire cost? 45¢/M.

(13) How much would carbon steel cost? 10¢/M.

(14) What operations increase that cost to $3.00/M? The ±0.001-in. length tolerance, the 0.00025-in. OD tolerance, the chamfer-radius end construction, the No. 440 stainless steel, and the hardening.

(15) How is it made now? It is made of material in excess of the desired diameter and cut off too long. Then, after hardening, the ends are ground to length and the outside diameter is ground to size. There are 12 operations involved.

(16) Can wire be purchased to the diameter tolerance required? Yes.

(17) Will automatic screw machines cut it off to the ±0.001-in. length tolerance? Probably not. We would expect ±0.003 in. from them.

(18) How close will wire-forming equipment shear it to length? Good equipment will hold it to ±0.002-in.

(19) Why not cut it off on a form cutter that will provide, in one operation, the necessary chamfer, radius, and end flat? It might work. The problem would be to cut it off to the tolerance of ±0.001-in.

(20) Some cutoff methods normally would leave a small tip in the center. Wouldn't it be desirable to do so? We would expect so, providing the tip size was closely enough controlled.

Next month we will continue this purchasing example and show the happy end to this buyers function buying project.

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FIRST - GET MORE KNOWLEDGE PART TWO

The buyer must have knowledge, must learn how to handle knowledge,must teach his peers and managers that he must have it and can handle it, and must teac them that much new benefit comes from his work if he has it.

Surprisingly, people in the knowledge oriented fields of engineering and science too often develop a"feeling" that essential comercially oriented people in their organizations cant really understand and handle basic physi science oriented knowledge. Parts one and two of this example will show th cost to the business of this wrong concept which so often prevails, a wrong concept that only the buyer can change.

Typical Example of Hesitation to Provide Knowledge to Buyer

A Purchasing and Production Control office was set up in a large encl- osure in the center of a factory. It required a rather large equipment whic provided both ventilating and air conditioned air. It was in the purchasing end, about 10 yards from a buyers desk. The equipment engineer gave instr- uctions, "No one in Purchasing is to touch any control or adjustment of the equipment. We will adjust it right and keep it right". Soon the temperature began to vary from 65 to 90 degrees. Sweating and freezing and making

phone calls for engineering attention continued for a few days. Then I called the equipment engineering manager , told him it was over 90°, and requested him to come over. He did. I told him that it was necessary for his engineers to teach our nearby buyer about the equipment, so that he could provide comfor He said. "I will never allow a purchasing department buyer who just sits at a desk to touch the controls of the machine and foul it up". My answer to him was,"I am asking you to reconsider. Bill Winkler (his real name) was a pilot who operated and flew a B-24 bomber successfully for 50 bombing missions over Ploesti oil fields, while always under attack. He is now our buyer who sits nearby the equipment. If you have an assistant who is a "fair" teacher, I'm sure Bill can comprehend the complexities of the ventilation equipment well enough to handle it". He did not respond. He got up and walked briskly out. It was a shock to him that a buyer could handle knowledge. Soon one of his people came in and discussed the operation of the machine and its controls with Bill. There was no more discomfort.

Example of Steel Pins Concluded - Buyer uses Knowledge Learned

Knowledge gained by work reported last month allowed the buyer to take several actions.

1. He saw that standard size steel was being bought, which was much too

large and required 3 centerless grinding passes to get it down to size and surface. He checked the steel company and found that the quantity was so large that the optimum size wire would be provided at no extra cost per lb. This would provide large reduction in both material and grinding costs.

2. He found 100% inspection used and paid for on the millions of tiny pins. Changing to approved sampling inspection methods ended much cost.

3. He found that the manufacturing factory had set its tolerance limit at ½ the close tolerance limits specified on the drawing. This resulted in throwing away all parts which came between ½ tolerance and the full toleranc of course adding them into cost overall. Engineers of the buyers company said parts using the full tolerance instead of half tolerance work just as well in the product, so that throwing them away was complete waste.

4. Factory observation showed that the machines used, while in constan service on this one job, were not located effeciently with respect to each other. Much benefit came from some re-aligning.

5. Good production planning considerably improved the handling of the and material
pins/into, through and out of the manufacturing process.

Meanwhile the buyer, who at first was skeptic about getting into a "big involved game" was finding that the avenues open to him because of more

knowledge, were remarkable. He received a letter from the supplier which read in part, "Our production department has been doing a lot of work in connection with better and more efficient feeding methods. This plus the matters listed below, has resulted in some rather startling reductions of costs, making possible the new prices quoted. It was basically achieved by four changes.

1. Start with smaller stainless wire, reducing material and grinding.
2. Use all allowable diameter tolerance.
3. Use and charge for approved sampling method inspection.
4. Improve Handling.

Quotation for the pin is reduced from $3.65 to $1.90 per M".

Results. This meant that the buyer was buying the identical items, made to the identical drawings and had added $87,000/yr to earnings. Fortunately the same improvements were used in making a similar pin which was twice as long, and of which 1/5 as many were used so that $25,000/yr of additional benefits resulted, making the total pay-off of the buyers work $112,000/yr.

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Value Analysis
Buying Techniques
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GETTING FUNCTION KNOWLEDGE, DIFFICULT AT FIRST, BECOMES A ROUTINE SKILL

As illustrated in the example just reported last month earnings were increased $112,000/yr because the buyer did something different - and difficult, and appropriate in his professional environment. His actions were much resisted by both his in-company associates and his vendor, as he started gaining the essential knowledge. Gradually, as he aggressively continued, this resistance abated and turned to support - a normal happening.

When the Buyer Proves he can Handle Knowledge, Unexpected Support Appears

When the added earning rate was reported to the vice Pres who managed the operation, he asked for a report on how it happened. He was fascinated, and thoroughly investigated it. Then, with all of the facts at hand, and with full recognition that it could have been done 4 years earlier, he had a little report bulletin made and sent to his peers. He called it PROFESSIONAL PURCHASING, "THE STORY OF THE LITTLE PIN". It included actual copies of the correspondence involved and the step-by-step VA techniques used. Now an epidemic of interest "broke out" in meaningful company levels. I even received several calls from vice-presidents in charge of other operations, asking, "Do we have any buyers in our Plants who have been trained in VA buying techniques?" It

was, at once easier for those buyers to get the support needed to obtain the added knowledge which would allow them to add earnings.

"Which buyers in our Department know the VA Buying Techniques?" asked Some VI

I told them, gave them names. One said, I'm going to ask them to do the kind of work in that"little pin" report,on some of our purchased items. Example: One of the items a buyer studied was a tiny radio frequency transformer about the size of two grains of wheat. 200,000 /yr were bought at a cost of 39¢ each, $78,000/yr. The buyer had previously sent out the drawings and specifications and bought from the lowest priced good quality supplier. Now he questioned, "What function is wanted? What functions am I buying?" He learned that the function of a transformer is to transfer energy between two adjacent, but not connected coils of wire. One coil normally contains more turns of wire than the other, so that voltage is changed. He at once saw that the function wanted was supplied by these two adjacent coils of wire He determined that the insulated coils accounted for only 10¢ of the 39¢ cost, and, brought all of the function wanted from the product. How then can he secure that wanted function without much of the other 29¢ of cost? Basica then there were two "supportive" function needs. The coils had to be held in proximity to each other, and the assembly had to be mounted into the chasis.

It was observed that following the custom used in larger equipment, a spool was used. The coils were wound on the spool. Microscopic holes were drilled in the spool ends and the tiny wires were threaded thru the holes, a very difficult task, absorbing lots of time and cost and contributing nothing to the needed service function. He knew that thru the decades new metals and chemicals had been developed, which had superior properties for specific uses. He called two of his supplier firms who developed and sold a large variety of adhesives. He asked them if they had a product that would hold the wires in position permanently, under heat and cold, dry and humid conditions which might be used in this application.

One of them did. Two touches of the adhesive and the coils and the mounting tab were secure. No drilling of the tiny holes. No threading of the tiny wire thru those holes. Just position the coils and the mounting strip and add two touches of adhesive and the mounting function was complete.

The "Supportive Functions" - which do not contribute to User Functions - were effectively accomplished for a cost (including vendors overhead and profit) of 9¢, so the cost became 19¢ instead of 39¢, with no tooling or set-up costs. The annual cost which had been $78,000, now became $38,00

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CHECK "SUPPORTIVE" FUNCTIONS FOR EXTRA EARNINGS

One purpose in my writing is to help the buyer develop a system of clues, or guides so that he or she will select a high percentage of profit making projec for use of the special VA Buying Techniques. One such approach was introduced in October - Checking the money the buyer pays out for "Supportive", rather than USE or AESTHETIC functions which are what the user really wants.

Supportive Functions - are always "Open-Season" for the Buyer

Any function, large or small, useful or aesthetic, which the user wants is called a basic function. It causes him to want the product or service. Usual to get those wanted functions, much money is spent for Supportive functions. The user buys a tractor because he wants power at the drawbar or the pulley. He gets also a large and costly package of supportive functions, functions whi he could'nt care less about, functions which have added a lot of cost to the tractor, functions which are necessary in order to allow the engine and other parts to perform. They are Supportive functions.

One is the oil and the lubrication system. It performs no service for the user, but it, or some equivalent, is essential in order to allow the engine to

run, and the bearing surfaces to endure. Another is the plating or paint on many iron parts. It does not contribute to the pulling power, but, since we have chosen iron or steel to help perform the basic function, we have the cost of the supportive function of painting or plating or other to prevent the meta from rusting away. Had bronze, or brass, or monel or perhaps aluminium been chosen to help achieve the basic function, perhaps no cost for a support-ive function of "protect the material" would have been required. It can at once be seen that methods for accomplishing the supportive functions and the costs involved are "open game" for the buyer. Since the basic functions to the user may in no way be effected, approvals for the change are usually forth coming. Of course there can be no quality degradation. Supportive functions accomplished by different means at lower costs must provide 100% quality.

The buyer who achieves large earnings improvement has learned to look for the costs of supportive functions. Always in his mind is the question, "Does this part of the cost buy something which directly accomplishes the function for which the user is securing the product or service?" Then supportive functions become relatively easy to separate and function buying yields greate return. In the October example, the buyer knew that the wires of the small transformer achieved the total basic (or wanted) function, and that the spool

was just to hold and mount them, therefore providing only supportive function. Straight thinking ended $40,000/yr of supportive function cost, adding it into the earnings column.

Useing VA Buying Techniques to Lower Costs of Supportive Functions

Here's how it works. Example 1. This same buyer reasoned that on most transformers the spool must accomplish only a supportive function,so he looked at another. It was about an inch square and ½ inch long. It also had ends and small holes for threading in the wires. It was a plastic product, molded, with some finish work. Ready to use, it cost 40¢. There were 15,000/yr. Total cos $6,000/yr. , enough to be worth looking at. He discussed it with some of his vendors, asking what their equipment could make. Two of them sounded interesting, so he asked them to describe how they would make it and what they would quote for it. One quoted tooling cost of $500, then cost each at 3¢. The result was that after a one time payment of $500. the annual cost, instead of $6,000., became $450. In this example the coil was wound in-house, and much supportive function cost was accepted by the factory to thread the small wires into the tiny holes. The buyer brought that knowledge to the attention of the mfg. methods department for internal attention if they so desired.

Example 2. The buyer purchased 100,000 springs/yr for $34.00/M, $3,400/yr.

They were made of stainless steel spring wire and were used in an electric switch. The buyer reasoned that it was the property of "springiness" which performed the function the user wanted and that the extra cost of stainless steel over spring steel had to be for the supportive function "protect the steel". But how much was that function costing? He secured quotation on the springs from spring steel. They would cost $5.00/M. He now knew that the supportive function was costing $2900/yr, $29.00/M. He asked his spring vendors to to quote and to reccomend springs for the application, based upon their equipment, expertise, and experience and knowledge. The suggestion and quotation which were used , was to change from the type of stainless used to 302 plain finish, not passivated stainless steel. Cost became $13.00/M.,$1300./yr. The product functioned the same. The buyers work on supportive function paid $

Example 3. The name of the item gave the buyer the clue. "Buy 5000 steel counterweights. The buyer reasoned that clearly the functior wanted was probab "weight". The specification continued "From 1/8" steel plate 1 foot wide, stamp out flanges which will be 12" OD and 10" ID. Cut each onto 12 segments, (prox 3" long)." The parts had been costing 40¢. The weight of basic steel would cost 2¢,at that time, and provide the function really wanted. Supportive function added 38c. unless the particular shape brought another wanted functio It did not. Purchase cost became 4¢ instead of 40. $1600/yr was the payoff.

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Value Analysis
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THE VA JOB PLAN IS STEP-BY-STEP PROCEDURE FOR THE BUYER

Superior increased earnings from a buyers work results from doing a lot of things right - exactly right. This is not so difficult if the buyer has a plan --and follows it. What is the Plan?

Step-By-Step Job Plan Leads Buyer To Productive Achievement

A landmark system of techniques is the VA Job Plan. It schedules the buyers energies, at the proper time, into the optimum steps, or actions, pinpointing overwhelming energy at that moment, then going on to the next step To secure high overall results, here's a list of what must be done exactly ri in each step - before passing on to the next.

We must:

1) Identify and understand the function desired based upon what is being purchased.
2) Separate basic or "user" functions from "non-user" functions.
3) Identify the "function" as nearly as possible.
4) Enlist supplier assistance in achieving the function, with extra effort on the "Supportive" functions. (non-user)
5) Identify and end "stoppers."
6) Gather all information from the *best* source.
7) Consider the possibility that the best source may be incorrect or incomplete.

The first step is MIND TUNING. It establishes a complete sense of definition and direction. It results in a clear answer to the question, "EXACTLY WHAT AM I TRYING TO DO"? To sharpen up this sense of directi a dozen or two questions, such as those following, are listed and studied

Am I trying to:

assuredly meet production schedules?

handle a large dollar volume of purchases?

build up the volume of items I handle?

make a good monthly report that will please my manager?

keep up with my never-ending volume of work?

find sources for buying difficult items?

get lower prices on most things that I buy?

get my share of vendors output?

help the designers find more suitable materials or ideas from vendors

build up personal respect from vendors?

make more contribution than is expected, to earnings?
etc.

Each buyer will make his own personal and private list. He will think it through from the viewpoint, "Exactly what do I want to be trying to do"? He will then establish for himself the right precise meaningful

action guide. It will show "EXACTLY WHAT I AM TRYING TO DO". Often the use of time and effort change dramatically,as will be shown by the following example.

The Requisition Said, "Buy and Have Installed, a Dust Collector,estimate $40,(

It came from the board of directors. It was to be installed on a group of eight silos on a cement plant in the dessert. The buyer and the plant engineer were a buying team. They asked that we help them try the VA Buying plan on it. They said "We dont need the Mind Tuning step, we know exactly what we're trying to do. It is to economically and efficiently design, buy and have installed, a dust collector, as we are told by the home office". Then followed an hour of hard thinking with much questioning and answering. Then emerged an answer they agreed upon, "We are trying to assist in operating a competitive,profitable business, by ending (cement) dust". Now the steps of the plan could proceed.

VA Job Plan Step Two - "Get Knowledge"

The basis for effectiveness is built in this step. Dredge deep for knowledge with no thought of analysis or possible solutions. They will come later and will be made productive by knowledge gained now. What are the facts? What is true? What is believed? What does the user really want? What is known?

Nearly 100 questions asked and answered brought the needed knowledge into view. Some of the specific questions will illustrate.

Q. Is there always dust when the plant is operating? **A.** No.

Q. When is there dust? **A.** Under differing conditions of loading, silo filling and emptying.

Q. To be specific, when is there *no* dust? **A.** When one or more of the eight silos runs over.

Q. Any other times? **A.** Yes, when the silo being emptied is nearly empty. This happens when 30 lb. of air pressure is infused into the cement at the bottom of the silo to promote flow. When the silo is nearly empty, this amount of air carries some dust out the top.

Q. When else? **A.** A convenient 150 lb. air line is provided for the truck loader to blow out the chassis of his truck. Sometimes, though, the loader uses the 150 lb. line to accelerate cement flow in the silo. Then there is dust.

Q. Why does he use the 150 lb. line instead of the 30 lb. line? **A.** Sometimes the 30 lb. line is stopped up. To save time the truck loader inserts the 150 lb. line into the bottom of the silo.

Q. Why does the 30 lb. line stop up? **A.** The line comes under a road, a low point. Rust, sludge and dirt accumulate and periodically stop the line.

Q. Is there dust at any other time? **A.** No.

Q. Then what causes dust to drop out of a stream of air? **A.** Air moving through a duct, for example, carries a certain quantity of dust along depending upon the velocity of the air and the size of the particles.

Q. Are some of the silos always partly empty? **A.** Yes.

Q. Is the cement formulation substantially the same? Would "drop out" of dust from one silo contaminate another? **A.** There are very slight differences in some formulations. The small amount of dust would make no difference whatever to the quality of cement in any silo.

Q. How much do you estimate the periodic dropping of cement dust around the plant costs you? **A.** $1,000 per year for cleanup, and $1,000/yr for lost cement.

Q. What is management's policy for return of capital invested? **A.** Two years. On that basis cost should not exceed $4,000.

With the answers to these and other questions, the buying team felt sufficiently informed to proceed to step three.

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Magic is the right system, completely executed. My son Robert, while riding with me 150' high on the magnificent four-mile-long Bay Bridge at Annapolis looked down upon two dozen assorted craft in the water below. Some carried pile drivers, some cement mixers, some steel handlers, and some assorted materials - all working at building another high-in-the-sky span in parallel. He said, "I can't conceive of men being able to build such a bridge", and then he added, "And the men who get the job done are no smarter than you and I". Then he made a comment that struck home to me. "It's the system that does it."

VA buying techniques are a system, a system which when fully used achieves incredible results. The VA Job Plan is a part of that system. Last month we started that plan, and one project which used it. Now we will contin

The six separate steps of the plan follow:

1) Mind Tuning—"Exactly what am I trying to do?"
2) Knowledge Searching—"What are the facts?"
3) Analysis—"Based upon these facts, exactly what and where are the opportunities for better solutions?"

Three important steps remain:

4) Creative Problem Solving—"How might we do it differently?"
5) Judgment Thinking—"Which new approach shall we improve and use?"
6) Implementation—"How shall we prove our solution, get the necessary approval, establish our supply sources and then do it?"

We dealt with steps 1 and 2, now,Step 3 - Analysis. Now that we have clarified what we are trying to do and searched for knowledge, what does the knowledge say to us? What are its meanings? What are its important problems? Should it be separated into two or more separate problems, for straight-forward solution? If so which problems should be solved first, then second, etc

The heart of Analysis, is"function thinking."

Functions are separated for individual study and then grouped as needed, like building blocks, for the best solution. By now enough basic information has been developed so that a "value figure" or cost for each function can be figured.

Tough self-questioning must continue in the analysis step. What are the individual problems? What is the total problem? What are the key situations to handle first? What end result seems reasonable and what steps—first, second, third—will achieve that result? What additional information is needed? What assumptions are being made? Are those assumptions still valid? Exactly which quotations should be obtained first? Which solutions will unlock good qualities and good costs in our entire procurement?

In the analysis step, the exactly correct problem is "set," not "solved." No need to arrive at a brilliant answer for the wrong problem. Our objective is to shape the task into a form which will readily promote solution.

Continueing the Dust Collector Example

From the knowledge developed in the previous step of the plan it became known that one of the times when there was (cement) dust was when the 30# pressure air line which connects around the bottom of the silo to make the powdered cement "fluid" so that it would run out into the truck below, became stopped up - and the 150# manual line which was there for the purpose of aidi the truck drivers to blow cement and dirt off of their trucks was used to induce cement flow. Thus the two problems below were "set".

1. How might we end the clogging of the 30# pressure air line?
2. How might we make it impossible for the trucker to get the 150# line near and into the silos?

In the information and knowledge gathering step we learned that when a sil was over-filled and ran over, there was dust. In "setting" the precise problems for solution #3 covered that item.

3. How might we end over-filling silos?

We will recall that there is some dust when the silo is nearly empty. The 30# pressure of air which is infused into the bottom of the silo to induce fluidity, is somewhat too much when the silo is nearly empty. Hence a specific problem was "set"- (for later solution) on this knowledge.It is #4.

4. How might we reduce the dust that blows up when the silo is nearly empty

Although this 4 would seem to cover all of the situations in the knowledge step in which dust was produced, it was thought desirable to try still another thinking period on means of ending small amounts of dust, so problem # 5 was

5. How might we end the small amount of dust which might still happen even after problems 1 thru 4 are properly solved?

Result Of Analysis Step

Now, instead of one large abstract problem, as the result of knowledge development, then the Analysis step, 5 specific smaller more definitive problems are"set". Note that they were set in language which will promote creativity, all starting with "How might we ---"

In the next issue we will show and illustrate the"Creativity" Step of the VA Job plan.

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"CREATIVITY" AND "JUDGEMENT" STEPS OF THE VA JOB PLAN

Often the buyer must be the lead man in the project of staying in busines and reducing costs. Often the project is so vital that a good system should be used. Mind tuning,Knowledge Searching and Analysis have been presented. Now another vital step - Creative Problem Solving, is shown.

Step Four,Creative Problem Solving

Creativity is different, very different than usual mental work. Part of the mind must be suspended, just as the use of the brakes on the car is suspended while the throttle is down. For relatively short periods of time, all judgeing must be suspended. If participants judge ideas before they state them, at least 9/10 of the options will never be brought into view. Often th best problem solution is developed by eliminating the defects from those idea which, only the mind trained in the process of effective creativity, allows to be voiced. Judgement will come later. First, let the approaches come.

To be highly useful, creative thinking must be highly specific. It must apply precisely to the exact problem at hand. If the analysis step turns up more than one problem, then creative thinking is applied to each separate problem. Later, in the judgment step, the creative thinking done on each problem will come together in one good solution.

In the case of the cement company, the analysis step turned up five problems:

1) How to prevent the clogging of the 30 lb. air line?

2) How to make it impossible for the truck loader to get ahold of the 150 lb. air line when he was at the silos?

3) How to end over-filling the silos?

4) How to reduce the small amount of cement dust that blows up at the end when the silo is nearly empty?

5) How to end the small amount of cement dust that might happen even after the above problems are properly solved?

Between 10 and 20 thoughts, ideas, and approaches were listed for each of these five problems. They were considered one at a time in the order listed. Each was finished before the next was started. Creativity could have been more extensive, but considering the quality of information thinking and analysis and the one day we had assigned to the task, it seemed adequate.

Some of the creativity on item one is listed. First the wording used was, "How might we stop the clogging of the 30# air line"? Approaches follow:

Use a larger Line

Put the compressor at the silo group location.

Blow out the line on regular maintenance.

Use expandable line.

Parallel it with another line.

Put a standby small unit at the silos.

Relocate the line.

Put a small air compressor unit at each silo.

Put a dust-proof compressor unit in each silo.

Close the top of the silos.

Step 5 is Judgement Thinking. The essence of productive judgement is;

1) Thinking deeply of the unusual benefits which might be suggested by each approach.
2) Selecting one or two approaches which, when developed and approved, would meet or exceed the need.
3) Maximizing the advantages of those approaches.
4) Minimizing the disadvantages of those approaches.
5) Bringing them together and adjusting differences so that they meet the overall need of the entire problem.

Achievement here results from restricting judgment to the few minds that are informed, thorough, and creative enough to spot opportunities to strengthen good approaches. Best results are secured by one person and certainly no more than two, providing the two think in harmony as a pair and call others into specific discussions as needed.

Great caution is essential here. Experienced people like to judge, to cross out and abandon ideas which, at the moment, do not appear useful. This is not judgment thinking; it is destruction based upon individual habit patterns. Judgment thinking is thinking creatively about an approach that might meet the need. It is selecting ideas and creatively maximizing the benefits which might result from the approach. It is selecting ideas and creatively minimizing disadvantages, ~~which are apparent.~~

Case Study Concluded

The buyer and the plant engineer were

the "thinking pair." They did the judgment thinking. Because of strict adherence to each step of the VA Job Plan, the pair established the following approaches to solving their problems:

1) Improve maintenance on the 30 lb. air line and run it overhead where it crosses the road in order to eliminate the trouble spot.

2) Move the 150 lb. air line so that in no case would it reach the silos.

3) Some useful steps were selected to minimize or stop the over-filling of silos.

4) Some ideas concerning the location, number and type of air nozzles both around and inside the silo base (to induce cement flow) were discussed for further investigation.

5) Each silo had a ventilation opening at the top. It was from these openings that cement dust escaped. It was determined that a simple duct system connecting all of these vent openings could be installed for about $2,000. Dust from one silo would then drop into the quiet air of another.

Costs for these improvements would come to just under $4,000, the thinking pair determined. Thus the objective of top management—to end cement dust from the silos—could be secured for only one-tenth of the intended cost of $40,000.

Step six in the VA Job Plan is implementation. All that remained was for the buying team to secure necessary approvals, establish supply sources, and execute their plan.

The VA Job Plan, as we have seen, is a tough taskmaster. But its results can more than justify.

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KNOW THE FUNCTION
DETERMINE ITS PROPER COST
BUY IT FOR THAT AMOUNT

A plumber who installs a sink knows when he's done. A builder who erects a house knows when he's done. And a farmer who plows a field knows when he's done. Not so, for a buyer. He searches and negotiates until he gets material with quality, with the required delivery and (hopefully) with an agreed upon price.

For the productive buyer, the search begins by identifying the function, evaluating it and determining its worth in dollars. The buyer is then ready to complete his purchase, and like the plumber, the builder and the farmer, his job is done.

What is his competitor paying for the material? What different material is his competitor using to accomplish the same functions? What different suppliers have materials which would achieve the same function, and what would they cost? These answers might establish the function value.

Evaluate Functions by Creative Comparisons

How does a buyer use VA principles to evaluate function? Being a relative rather than an absolute measure, value is determined through creative comparisons. If there is no comparison, there is no evaluation; and the quality of the evaluation is in direct relation to the comparative skill of the buyer. Meaningful values of functions, then, result from comparisons. But be on guard here because comparisons to past practices are false indicators.

To correctly assign a "value" (lowest cost that would fully provide it) to a function, it must be determined what the lowest cost would be to a competitor who has keen mental resources and good physical resources. The process of evaluating functions typically goes like this:

1) Individualize separate functions.
2) Understand them completely.
3) Creatively establish other unobvious means for accomplishing each function.
4) Assign approximate cost.
5) Add the values of the various required functions to arrive at a value for the larger overall functions. Where functions are not interacting, add arithmetically. Where they are interacting, combine them by using plus or minus cost factors for the areas of interaction.

In this preliminary evaluation of the function, *do not* strive for arithmetic or technical exactness. Instead, search for areas of promise, approximate benefits to be gained by further study, and general directions for precise thinking and work. The result is now the tentative *value of the function,* based not upon the habits and practices of the past, but rather upon such new and different factors as the state of the art now provides ~~and the skill and creativity of the thinking can relate~~.

Examples Will Show How to Use Function Evaluation

. Navy landing craft used 200-gal. gasoline tanks. The tanks were custom built, fabricated of specially shaped and welded noncorrosive metal which would survive a non-combat life of eight years. One thousand such tanks were on procurement at a quoted cost of $520 each.

Using VA principles to make a useful comparison, the buyer raised many questions. What is the proper cost to contain 200 gallons of gasoline? How would we do it in a machine shop, and what would it cost? How would it be done on a farm, and what would it cost? How are 250 gallons of heating oil stored in houses, and what are those costs?

Two comparisons seemed pertinent. The standard 250-gal. residential fuel oil tank cost $30, while four 50-gal. steel drums cost about $25. With these two figures, the buyer knew that a major part of the task could be accomplished for between $25 and $30. If the drums were chosen, some anti-corrosive treatment and perhaps some extra connections and valves would be needed. So an over-all value of $50 was tentatively set for the function instead of the $520 planned cost.

This function evaluation was shared with the technical people, and suppliers were consulted. The result ~~of this whole exercise~~ was the selection of a gasoline container system based on four suitably connected anti-corrosive drums. The cost per unit was $80. The entire 1,000 containers were secured for $80,000 instead of the intended $520,000.

Buyers should never be concerned that the tentative value of a function is not precisely accurate. ~~We'll~~ Sacrifice accuracy for creativity at this point. These tentative values really serve to stimulate new, constructive, imaginative thinking.

The buyer determined what function or usefulness he was buying. He developed, by comparisons, the value of it, about what he should pay for it. He bought it for the value indicated.

In another example, determining function, evaluating function and buying the function for near its value decreased costs to 1/20th.

An
~~The~~ assembly was about the size of a man's fist, weighed two pounds and was used in periodic quantities of about 200. It ~~The assembly~~ contained machined and brazed bronze castings, springs, a bellows, shafts, nuts, washers and pins. Its function was to respond to a rapid pressure buildup in the electric transformer. In use ~~Now~~ this assembly was cocked like a gun, and pressure 20% above atmospheric triggered a pointed shaft which broke a small glass enclosing window and allowed pressure to escape. At $20 each, it was an expensive assembly.

The buyer wanted to put a dollar value on the function of this assembly. To do that, he had to compare it to something else that would break the glass when the pressure increased.

Suddenly, the buyer thought to himself, "If the glass were exactly the right thickness, it would break naturally under increased pressure." This revelation sent him on a search for chemistry laboratory equipment suppliers. From ~~At~~ one supplier he found just what he was looking for—a catalogue of "rupture discs", each of which was calibrated to break within a given range of pressures.

He ~~The buyer~~ learned that a rupture disc in the proper pressure range and of the right size cost $2. The piece of glass now in use in the electric transformer cost $1. He saw that the ~~The buyer began to see that the same~~ function of the $20 glass-breaker assembly and the $1 glass disc could be performed by a $2 rupture disc alone. Thus, the ~~dollar~~ value of the function of the $20 breaker assembly was actually only $1—the difference between the cost of the glass disc and the rupture disc.

--LDM--

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Value Analysis
Buying Techniques
Written ByL.D.Miles

BUYER CHANGES "NON-FUNCTION" COSTS TO EARNINGS

The buyer who has become a profit center for his company by using VA Funct buying principles knows and "feels" that he is not buying materials or services, he is buying wanted functions. Progressively, he learns better what functions he is buying and what he is paying for each function. He also lear the value of each function, that is, what it is worth. He uses his skills to buy each function for what it is worth. However, he has learned that he is often buying functions that, in reality, have no value to his employer. He therefore thinks sharp to recognize each individual function he is paying for and make sure it is a wanted function. As he expands his general knowledge and function knowledge he expands his contribution to earnings.

"I Dont Believe This Item Has a Wanted Function"

The item was a small capacitor the size of an inch long section of a pencil. He bought 500,000/yr @ 10¢ each, $50,000 each year. The buyer develope the story.

People often fretted because butter, just taken from the refrigerator, was too hard and brittle to cut and spread with a butter,or table knife.

To meet this need, a small compartment was designed,usually into the door, of the refrigerator,to hold a pound of butter. To keep it a little softer, a tiny electric heater was inside the enclosure. To keep it from becoming too soft,a small thermostat was also inside. It opened the contacts, when the butter was soft enough,closed them as it became hardened. To prevent sparking across the contacts as they were opened, the buyer bought the specified $50,000 of capacitors per year.

He checked deeper,with the electrical laboratory,"How much sparking was there to stop?" His thinking was that perhaps $25,000 worth of capacitors would handle the function. The laboratory, a little later advised him that, actually there was no perceptible sparking of the contacts anyway. They said that sparking,when opening contacts, occurs when there is inductance,that is, turns of coiled wire, such as transformers, in the circuit, which causes the current to try to continue flowing. This device was just a small resistive load, which heats up when current flows, has no inductance, so does not cause sparking. They said, no sparking exists, so no function is performed by the capacitor. They eliminated it. The buyer had added $50,000 per year, almost $1000/wee to gross earnings. He found that the function was worth zero. That's what he paid for it.

"I Doubt That The Non-standard Head Brings Wanted or Needed Function"

The buyer using VA buying principles wants to pay out no money for functio which are worthless. He methodically pursues that purpose and ends useless c

The example of the screws with the expensive heads will illustrate. Small electronic controlls each had 12 screws for receiving small wires. There wer 50,000 controls per year, 600,000 screws. They were bought to drawing spec- ification and cost $6.00 per thousand, $3600./yr. In getting general knowled the buyer learned that they were made of steel,they were standard #8 screws, excepting that they had #6 sized heads, which were smaller.The standard scre even of the larger size, #8, would cost only $2.00/M.

Why were not either the #6 or the #8 standard used for a saving of $200. every month?

Next the buyer got Function knowledge. What was their function? Each fit into a bracket on the control. A small wire was stripped of insulation and put around it, and it was tightened down. Q. Were they often removed in ser- vice? A. No. One installation was usually for the life of the equipment. Q. What additional function is served by the larger heads? A. None probably, but it is an Underwriters requirement, so there was no choice. Q. What,specifi- cally did the Underwriters require? A. #8 screws.

Now, useful creativity followed. Three of the alternatives are listed.

a Use a fastener that involves no screw.

b Use the standard #8 screw.

c Re-submit the use of the #6 screw to Underwriters for approval.

Analysis/and ,judgement Action followed. Analysis and judgement of ideas follows the pattern of 1. What's right with the idea? 2. What's wrong with it? 3. How do we minimize or remove the disadvantages.

b. 1/3 of the cost, why not use the #8 screw? Of the 12 positions,there was a spacer partly above one, which might be troublesome to the screwdriver while inserting the sscrew. The spacer could be notched when it was stamped out, then there would be no problem.

c. With the low currents flowing in the wires into and out of the control, it seemed to be sound engineering to use the #6 screws. Re-submit to Underwriters. Asked why they specified #8 instead of the slightly smaller #6 screws, they said "so that the head would be large enough to assuredly hold the wires". It was then seen that,at 3 times the cost, using the shank of the #8 screw with the head of the #6 did not even comply,in spirit. Underwriters approved the standard #6 and the buyer ended $200.per month "no-function" co

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Value Analysis
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PAY ONLY WHAT THE FUNCTION IS WORTH

To re-sharpen the focus of just what the productive buyer is trying to do and how he starts when using the VA buying principles, five points follow.

1. He is buying some function - no matter what the requisition says. He wants some job achieved. He is getting some function that is needed and/or wanted for someone. He's going to learn what those function are and know a lot about them.

2. He has decided that he will help management earn more profit, or the equivalent if in a service industry.

3. He always thinks in terms of dollars per year. That 's what is important. What money is left or what money is gone at years end?

4. He uses ingenuity and creativity to determine the proper cost of the function - not necessarilly, at first, the proper cost of a materi

5. When he knows what functions are wanted and what the proper cos for those functions are, he uses his good buying skills and experience to buy them near that cost.

The doors opened to the buyer by first learning what the function is worth - its value - are fascinating, actually are like an adventure. Let's experience a couple.

A buying experience. The item was 1,000,000 spring clips per year. Th function was to hold the cover on the plastic cold-comtrol box of refrigera Cost was $7000 per year. The specified pieces were phosphur-bronze wire abo 6" long, the size of a broom straw with 4 bends. The buyer knew that phosphur-bronze is an expensive springy switch-blade material capable of millions of"flexes" without fatigue cracking. He knew that he paid much ex· tra for that capability, as compared to other spring bronzes which would be capable of tens of thousands of "flexes" without fatigue cracking.

This spring clip only flexed when the cover of the control box was being removed or replaced. He therefore felt that he was buying a great deal of function which was not bringing any benefit. He had it checked with maintenance and service people. "How many times thruout the 25 to 50 year life of a refrigerator will this cover be removed"? He was told, an average of six times with a maximum of twenty.

Clearly he was buying unused function. It was changed. Cost became $3,000 per year. Another $4,000. per year was shifted from expenses into earnin

Another buying experience. The requisition read,"Buy 1000 200-gal. gasoline tanks, to the enclosed specification, for use on Navy Landing Craft". The buyer knew the function was to contain gasoline, and that the previous purchase cost $520 each totalling $520,000. It merited the use of VA buying techniques. The tanks were a custom built shape, fabricated of specially shaped and welded non-corrosive metal, roughly cubicle in finished shape. Specifications called for materials which would survive non-combat life of eight years. What was that function worth? To achieve a useful comparison, many questions were raised. What is the proper cost to contain 200 gals. of gasoline? How would we do it in a machine shop, and w would it cost? How would it be done on a farm, and what would it cost? How are 250 gals. so often contained for oil burners in residences, and wh are costs?

Two comparisons seemed very pertinent. The standard 250 gal. fuel oil tank used with oil burners cost $30. 4 50-gallon steel drums would hold 200 gallons and cost about $25. So, it was seen that about $30. would pe form an important part of the task. Some anti-corrosive treatment, and per haps some extra connections and valves would be needed for use with the dru so an over-all value for the function of $50, instead of the $520 planned

Technical people were provided this function evaluation, and the logic back of it. Suppliers of the materials which would be needed were consulted. The result was that a container system, actually based upon the use of 4 50-gallon drums properly anti-corrosive, and suitably connected, was used. Its cost was $80. per unit. Good recognition of the potential and prompt work by the Dept of the Navy, in this case, secured the containing system for $80,000, instead of the intended $520,000. Big gainers were the taxpayer

This buying experience again illustrates the effectiveness of the five poin He changed his concept of his task from buying specified tanks. to buying needed functions. He had already determined that he would invest more mental expertise in ending needless expenditures. He saw $520,000 per year, and it was worthy of his attention. He effectively established the approximate proper cost for the function, by comparisons with other means of achieving it. He Then used his good buying skills to buy it for $80,000 instead of $520,000.

Planned - Executed - and achieved.

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Value Analysis
Buying Techniques
Written by L. D. Miles

NAME PURCHASED ITEMS BY THE FUNCTION THEY PROVIDE

Try not to buy "Screw Machine Parts". Encourage a name that relates to function. Aside from that, the name is automatically too restrictive, and discourages productive thought. Perhaps it should be a "headed" part, or a casting or a stamping. Thinking is promoted by function names. Promote the change whenever practical.

At first the requisition called for 170,000 steel screw machine parts per month. It was changed to 170,000 pole pieces. That was a step towards function, but, "What is the function of a pole piece"? Probably a more functional name would have faster propelled profitable buying. We will follow the buyer as he probed for knowledge on this one.

First he told engineering and manufacturing people that he was going to invest some effort in it and solicited their help. Some of the dialogue follo

Q. What is a pole piece? A. A little slug of relatively soft iron that mounts in a radio speaker.

Q. What does it do? A. Being cylindrical in shape, it sits on a magnet then makes a path for magnetic flux out thru its sides. A thin cylindrical coil which mounts to the speaker diaphram "floats" around it. Changes in the magnetism are picked up by this coil and cause small movements of the speaker diaphram which produce the sound.

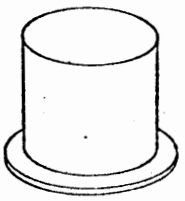
Q. To perform well, what parts of its specification are critical?

A. Three items. 1. The face that sits on the magnet should have a very smooth surface. Any roughness would ,in effect, introduce air gaps where metal to metal surface is best. 2. The cylindrical sides should be very perpendicular to this bottom face, so that the diaphram mounted coil which floats over it will always have identical clearances. 3. The diameter of the cylindrical part must be very uniform. Any variation would affect the clearance with the floating coil around it distorting the sound from the attatched diaphram.

Q. Is the length variation critical? A. No. The end of the pole piece away from the magnet is in air in the center of the conical diaphram.

Q. Anything critical about the small flange around the bottom? A. No. It is just to facilitate mounting and holding in place.

Length, ½ inch ±0.002 inch
Flange, 1/32 inch ±0.002 inch
Diameter, ½ inch ±0.0005 inch
Perpendicularity of face of flange to axis of cylinder, ±½°
Finish:
Surface of flange, F5
Surface of cylinder, F5



Pole piece.
(Magnetic Flux Conductor)

Now, the buyer knew what was really needed and wanted, in terms of functi and could, as needed, change that into language which would most nearly get th most optimum piece of functioning material. Simply and partially stated, it was a little cylindrical piece of soft iron about the size of the end of the thumb, whic would carry magnetism in the bottom and out the sides, with good surfaces on the bottom and the sides, and with a small flange at the bottom for the purposes of mounting. What type of supplier might best make it? It was now made of steel rod on automatic screw machines. This meant that, because of the flange, much cost for machining off the steel elsewhere, and much steel bought turned into waste.

He thought of his suppliers who had equipment for the "coining" process, in which small "slugs" of material are sheared from a rod a little smaller than needed, then dropped into a die and hit with a plunger. The pressure

and the impact are sufficient that the soft iron takes the shape and surface of the enclosure, so that great uniformity and great precision result. He presented the situation to two of them.

He told them that three items needed precision. 1.The diameter of the cylindrical part. 2. The bottom "face". 3. The perpendicularity of the sid of the cylinder to the bottom face. Standard industry allowances for all other factors were suitable.

Two important realities made the flux conducting part technically suitable, and two made it economically suitable for the cold headed (coining) process. Length and top variations were unimportant so that the fast shearing process could be used, also diameter of the flange was not critical,so that the metal had "somewhere to go" to absorb variations in slug size. There was zero waste steel. Rods were cut into slugs and the entire slug was shaped into the useful product. Furthermore the two operations of slug cut-off and coining, are extremely fast, so manufacturing costs became very low.

The new vendor coined it, then to provide extreme quality,centerless ground the face. Costs dropped from 3½¢ to 1¼¢,providing $40,000/year of additional earnings because of the buyers efforts.

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Value Analysis
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BUYER WHO LEARNS AND UNDERSTANDS FUNCTION PUTS MONEY IN THE BANK

Cost-reduction drives are a common and necessary experience in the operation of a successful competitive business. Often to people who feel overbusy with other matters they are a "pain-in-the-neck".But - to the buyer who wants to use more of his skills to put money in the bank they are often golden opportunity. To make real money by using his VA procedures, the buye usually needs help from others. During these "drives" he is often welcomed.

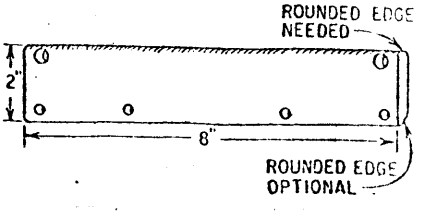
During one such drive, each part and component of a product,together with its cost, was displayed. The buyer saw a piece of 1/16" steel 2" wide and 8" long with a few holes in it that went into the product at 10¼¢ each. The annual usage was 1,000,000, which meant that a little over $100,000 went into the part. He knew that he paid only 2½c each, $25,000/yr for the steel. Where did the other $75,000 come in?

He told the project leader that he had been asked to help on the Cost Reduction Drive, and needed some more information. He asked,"what is the function of the steel strip?"

He received somewhat more answer than he expected, but it is so understan ably typical that we'll give it here. "You dont have to know the function. Thats our job. We change it from functions into materials. Your job is to buy the materials, to get good materials on time at good prices. Besides, sometimes the function is too involved and too hard to explain, and may involve technology that you dont have. Its better for you not to waste our tim talking about functions. Do a good job of buying the material".

The buyer responded, "we have learned that it often pays off for us to know the function of what we buy. There is $75,000 in the cost that to me is suspect. The first step is for me to learn the function needed and wante What is the function?" The project leader responded, "alright, we'll try i

Steel Part as Used

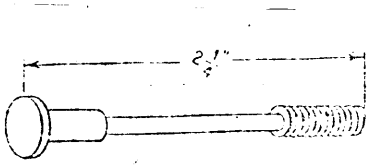


He said the steel became a back-plate in radio equipment. He showed the items it supported and what it was supported by. During tuning of the set

a part rolled along the top edge, so the function of the edge was to accept the small rounded pulley which moved along on it, and carry it without roughness or interference. Otherwise there were no functions increasing costs. The manufacturing records showed a large amount of costly grinding and smoothing of the upper edge in order to produce a rounded, smooth contour for the pulley shaped wheel to run on, from the sheared type edge which was on the incoming steel. There was much of the $75,000 of cost.

The buyer searched his steel specifications book and the "steel extras" manual. He called one of his steel suppliers and discussed the need. He found in the "Extras" manual, that by paying an "extra", his steel would be sheared along the side , so that one edge would be a "mill edge". He got samples of the "mill edge". He found it to be a rounded, smooth edge, even smoother than the job the factory was doing. He bought the steel with the mill edge. Most of the factory preparation work on the piece was eliminated. It now, ready to use, cost 4½¢, not 10½. A much wanted extra $60,000 per year for the business was the result.

Another item he observed was a steel screw 2¼" long made from ½" steel rod and having an undercut portion on the shank. 20,000 per year cost 15¢ each.



Steel Screw

The buyer saw much of the steel rod he bought beinc machined away. He aske

Q.What is the function? A. To hold a cover onto an electrical control.

Q. What is the function of the costly undercut? A.To keep the screw in the cover when it is taken off..

Q. Does the smooth machined surface of the undercut provide a function? A. No.

The buyer called in a supplier of roll threaded parts. He said he thought he could do it. He said,"I'll set my roll threader to cut one thread for 1/3 of the stroke, a conflicting thread for the second 1/3 of the stroke and yet another for the final 1/3 of the stroke. I dont believe there will be any metal left. Of course it will be rough, which you say doesnt matter." He tried it and it worked. Cost was reduced from 15¢ to 1.5¢. A years supply dropped from $3000. to $300.

Why? Because the buyer took the initiative, to understand, to gain knowledge, to learn function knowledge - not only what functions are needed but also what functions are not needed. He then used his expertise to select suppliers who might contribute and guide them into creativity. A buyer,using VA principles, puts cash into the bank.

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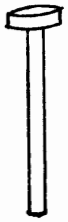
Value Analysis Buying Techniques
Written by L.D.Miles

UNDERSTAND THE FUNCTION - THEN LEARN ITS VALUE

As a group of buyers were learning the VA Buying Techniques, actual purchases were discussed. One buyer brought a part he was buying - and the group discussed it. It was a screw machine part. First it was re-named with a funct name, a "valve".

700,000 valves per year @ 6¢ each - $42,000



steel valve 1" long
all dimensions and surfaces
had precision tolerances
1/16" dia shank,
1/16" thick head, ⅜" in dia.
precision machined from steel bar

The buyers first developed knowledge and understanding. What does the valve control? How often does it operate? In what kind of an environment? What parts of it function to do the controlling? What maintenance or malfunction problems arise?

It was determined that it operated in a sealed environment of refrigerant material and oil, never at temperatures excessively hot or cold and always in an upright position with the head up. The valve action was the result of the underside of the head fitting over the top of a tubing. The valve was

suitably closed by gravity caused by the weight of the part including its inch long shank. The shank itself fit nothing,was inside the upright tubing.

The function being bought was to provide a check-valve, by operating in the top of a tubing with the under side of the head fitting over the end of the tube, so that flow upward was permitted by lifting the weight of the part but no downward flow could return. All operation was in a clean,closed system

Now with a fair understanding of the function, the question became, what is that function worth? What is the value of the function? What comparisons will be valid and meaningful? It was decided to compare it to the cost of a shingle nail. The buyer carried forward the project. The nail was made of steel, and about the right size, but of course had no close tolerances.

The shingle nail cost 1/20th cent. (The valve was costing 6¢) Of cours the shingle nail wouldnt work. The under side of its head was too rough, but it would come close to it if it had a precision operation on the under side o the head. He tenatively decided that, "Its not going to cost over ½¢ to get that function. Compared to 6¢,that could give an earnings increase of over #35,000/year. It's worth some work". With the function value of ½¢ in mind he went to work on it.

Specification Function Analysis

In using this buying technique the buyer identifies each item of the spec ification which adds cost. Each that adds cost, must bring some wanted function. Surfaces smoother than normal, clearances tighter than normal, perpendic ularness more exact than normal, each must be for some functioning purpose. The buyer checks other-than-normal specifications to learn which are adding cost. How much cost does each add and how much function does each provide? He often finds that some are not adding function. He then determines the amou of cost benefits which would develop if those specifications were not include He then communicates these function-cost relationships to the people responsi for the specification and for the performance of the item so that proper acti may be taken.

The specification-function analysis yielded the following knowledge.

1. Precision surface all over. In use only he underside of the head functioned by contacting another precision surface.

2. ½ thousandths inch tolerance on shank diameter. No function. It hangs in the center of the tubing.

3. ½ thousandths inch tolerance on the diameter and thickness of the h No addition to function. Head diameter only functions to keep the part o

the top of the tube. Thickness is only important as it allows changes of weight of the check valve. Standard tolerances are appropriate.

4. Precise tolerance on the length of the shaft. Non-functioning, fits nothing but the open tube. Does not measurably effect weight.

5. Shape and surface of underside of the head. Important functioning item. In operating it fits the precision top of the tubing in order to operate as an effective check valve,preventing downward flow.

The buyer now contributed his expertise, knowledge of vendor capabilities He submitted the item to vendors with facilities for coining the head, making the piece from cut off pieces of steel wire. The quotation was 1/10¢ each. The under side of the head always took the shape and surface of the die into which it was coined so the quality was superior. All other dimensions were standard tolerances.

The cost became 1/10 ¢, only double the cost of about the same amount of steel in the shingle nail. The cost of a years supply dropped from $42,000 to $700. An exceedingly powerful buying technique!

The large yield was because the buyer brought something into the system which had not before existed - development of cost-function relationships.

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Value Analysis
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DOES EACH COST BRING A WANTED FUNCTION?

Sometimes a function is paid for but not used.

Sometimes the wrong function is bought.

Sometimes non-function is paid for.

Sometimes the right function is bought,but more than competitive price pa

Sometimes the right function is bought, but, because it is performed the wrong way, it costs too much.

Sometimes cost-increasing tolerances or specifications which perform no wanted function, are paid for.

It distills down to buyer knowledge and technique. Knowledge of the functions wanted and needed, and technique for associating all functions with the costs, then "weeding" out the costs for functions un-wanted or un-needed.

How does the buyer reach beyond the piece of paper that tells him what to buy, and learn what functions are wanted? By following the item into use an observing, when practical, what it does, and by asking questions, listening t answers,then using his own knowledge and creativity.

Lets follow the buyer in an example. The requisition called for 100,000 pieces of white wicking scheduled for delivery during one year. Previous cost

was 9¢ each which would be $9000 for the years supply. Enough to justify thou Here are some of the questions? Q. What is the function of the wicking? A. Around the bearing on a motor is an oil tight cavity, which is filled with oi It has been found that in a few months the oil seeps out along the shaft thro the bearing, and it requires repetitive service but, if suitable wicking is placed in the cavity, the oil is held and only fed out as needed,so that one oiling provides one or two years of lubrication. Q. Why is white wicking spec· ified? A. The wicking has always been white. I suppose its such an unimporta detail that no one has ever questioned it.

Q. We divide wanted functions into two classes. One is USE function, whic causes the product to perform some use or service the customer wants. The onl other is AESTHETIC function, which brings some added pleasure to the user which causes him to buy this item instead of a competing one. Of course the proper amount of AESTHETIC function is as important as the proper amount of USE function. Extra cost to provide AESTHETIC function is in order only if i produces more sales. Does the customer see the white wicking? A. No,its packed around the bearing, out of sight.

The buyer knew that in most of his materials, pure white caused extra cost. White cement costs more.White cloth costs more.Pure white papers

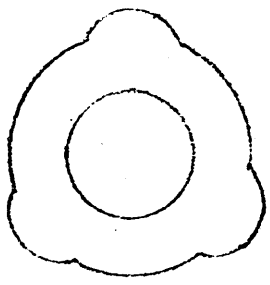
cost more. This was understandable because usually to get a white product, extra selection of ingredients was required. Any slightly gray ingredients were rejected. This meant extra tests, extra specification, more restricted sources of supply, and more costly carefulness thruout the entire manufacturing process.

By deleting the word "white" from his purchase inquiry, he was presented wicking with the identical usefulness at the cost of 3¢ each instead of 9. Only a small item, but $500. each month stayed in the business, instead of being paid out, because the buyer used his VA buying principles on the item.

What is the Function I am Paying For?

Just as the gourmet cook, when dining often thinks "what is the seasoning in that interesting pie"? , so the skilled buyer learns to think "what is the function or purpose of that part of the product I am asked to buy, or of that added part or specification of it?" Following that logic or feeling the same buyer picked up another $14,000 per year. The part is shown.

Steel "clamping ring"
6 inch dia. 3½" dia. hole
3 ears extending ½"
100,000 per year
28¢ each, $28,000 per year

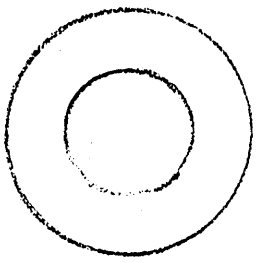


Clamping Ring

The buyer, by now, almost "instinctively" knew that because of the three ears on the part, it must be made of ½" larger diameter steel than the base part. The steel would have to be bought and thrown away. He knew that the tooling to produce the ears-on item was much more involved than without ears He felt that he must either find a real function for the ears, or make a project of eliminating them and their cost. He checked the cost of a plain steel "do-nut" 6" in dia. with a 3½ inch hole, of proper thickness. The cost would be 14¢.

With this approach and information the design engineer discussed the matter with the marketing and service people, and brought back the instruction, "take off the ears, we can as well clamp it on by the ring itself as by the ears."

Specifications were changed
The ears were removed
Cost became 14¢ instead of 28.
Anually $14,000. instead of $28,000.



Changed Clamping Ring

Another $1,000/month from the buyers effective work.

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Written By L.D.Miles

"ANY COST IS TOO HIGH, IF IT CAN BE REDUCED

The step-by-step systems of Value Analysis can help the buyer to achieve different vital objectives. One is to pay a proper price for a material or service that best meets the need of the requisitioner. He is, indeed, the last line of defense against the out-paying of money that brings no benefit to the company. Just as it is the good salesman's job to sell his wares for the highest price that he can get, considering all factors of competition, effect of price upon volume of sales and probability that pric too high will create new competition, so it can well be used as a guide to the buyers work that "Any price is too high if it can be reduced".

"Dont change our buying arrangement on this one, its tricky and very spe cial, and its working", surprisingly, far too often shelters purchase cost which should be ended by productive buying. What costs the buyer believes are too high, are established by his knowledge and skill. Knowledge of buying techniques, of function being bought, and of the supplier market; skil in full utilization of buying techniques.

How a buyer using knowledge, understanding,technique and courage added

$200,000 per year to his company's earnings. in this type of situation will be described. Example. The lubrication function on the high speed high temperature turbine shaft bearings was provided by mounting a gear which drove an oil pump, on the 1 inch diameter turbine shaft. Yearly quantities exceeded 10,000. Some of the gears were made in-house, while about half were purchased. Cost for those made in the factory was $31.00 each, while the cost of those bought was $34.00 each. Due to high speed and high temperature, and the consequences of any failure, the gear was precision thruout, with 100% inspection on all specifications.

During his search for the "right supplier", a manufacturer who had achi considerable success in some precision branches of the gear field had been located. The buyer visited the plant and liked what he saw. He left an inquiry with drawings and specifications. He verbally cautioned the supplier of the need to follow all details 100% on every gear. The quotation came in It was for $12.00. The buyer and his technical assistants on that task were dissappointed. They agreed, "he cannot be competent, he doesnt even know

what he is getting into". Nevertheless it was an intrigueing situation and justified more study. A tool maker and an inspector from the factory, visi the vendor, and brought back word that his facilities,processes, equipment and people were excellent. The buyer then revisited and went through each detail of the drawings and specifications, encircling in red, the tolerance requirements and specifications which it was feared the supplier might have overlooked. The vendor advised that in each case he had noted the require ments and had expected to make the gears according to the specifications. He did, however, sense the concern which was caused by the lowness of his quotation. He increased his price to $13.50 to provide a contingent amount to cover any possible unforeseen factors for which he had not planned.

A production order was placed subject to the strict limitation of prod-uction-lot release. Ten were released. When they arrived they were found to be the most precise,smoothest and best gears of that type which had ever been seen. 100 were released and came in the same quality, then 1000 with the same results and the vendor was fully accepted. This quality had an interesting side effect. Inspection personell,week after week, found nothing to reject. The supplier was controlling his own quality. So they eliminated 95% of the inspection expense. Now - thru the buyers knowledge,skill and

action, the function was being bought for the right price, $13.50, instead of $31.00 to $34.00, and the "bottom line" kept another $200,000 each year of the product design life.

What does this example teach? The enormous payoff for initiative. knowledge and techniques of the buyer? Yes, and other basic buyer-related trut Getting good value is often a "people" job. Getting good performance often means, finding sound scientific principles that will reliably provide the functions needed. That is the work of technical people. Very understandably when they have found a combination of materials and parts which achieve the function they are after with good quality and good life, they are reluctant to change anything, especially anything they consider to be critical, on it. Very often also during their development process they have searched for something that "works". Requirements have not been jelled up enough to utilize th usual full-fledged purchasing effort and contribution. Expert "people" work, as well as buying principles and skills is necessary in order to secure the assistance and open-minded help necessary from technical people.

This is a road to unexpectedly large benefits from the buyers work.

...LDM...

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Value Analysis
Buying Techniques
Written By L.D.Miles

ALSO IDENTIFY,EVALUATE AND BUY AESTHETIC FUNCTIONS

A few weeks ago, a buyer said, "You're like a violin with only one strin One string is not enough to play the whole tune. You always tell us to buy function, to know and understand function, then pay the proper price for the function we are buying. Sometimes it works great, but why dont you tell us how to buy when there is no function involved? Sometimes we must buy items which have no function. It would be a waste of time to try to und erstand the function, because there isnt any. Why dont you show us how to ap VA approaches when there's no function to what we're buying?"

"Good Question, I responded, because you told me what was bothering you. Give me an example" "There are many examples," he said, "Instead of buying string to tie up a package, which would function perfectly, I must buy ribbo I must buy decorative ornamentation which has no function, to put on the pro Take the whole field of Jewelry. It has no function. A bracelet does'nt ho the hand onto the arm, it has no function, it just hangs there. We need some techniques other than "function" approaches. I'd like your ideas on how we out the 'no-function' items, so we dont waste time trying to buy function wh there is none".

I replied, "you tell it like you see it, now I can do the same. You n bought an item or a service which somebody, the requisitioner, didnt feel a function, a use, a purpose. That purpose may be to perform some task f the user, or to please the user. Therefore we have two kinds of functions, and AESTHETIC. You have a very good understanding of USE functions, now pand that understanding to include the only other, and equally important k of function, the AESTHETIC. The AESTHETIC function is some color or shape size or sound, or lack of sound which pleases the customer and causes him buy this, instead of some other item". I continued and illustrated.

USE Function Makes it Work. AESTHETIC Function Makes it Sell. Both Are Vit

Buy Aesthetic function, the same as Use function. There are many simila ies and some differences. The customer buys Aesthetic functions because he wants someone, perhaps himself, pleased. Many products require both Use and Aesthetic functions. Some require only Use, or Aesthetic. The refrigera automobile,shoe,pipe and flower vase all require both in varying ratios. The "Rembrandt", the diamond, perfume, have only Aesthetic functions. The nail within the concealed walls of the building, the wire in the motor, the oil in the automob ile, all require only Use functions. In both cases, the customer buys it because he wants that function.

Aesthetic functions are vital. They are just as important as Use functio Under no circumstances does the use of VA buying approaches minimize the importance of buying Aesthetic functions. However, if the buyer pays for Aesthetic functions, and no Aesthetic function is provided, the money is wasted The large difference in studying and understanding the two functions is tha Use can usually be made understandable by objective reasoning, and testing. while Aesthet is perhaps wholly subjective. Persons skilled in "Use" values, can not necessarilly make correct decisions in"Aesthetic" values. This means that the buyer will work with the industrial designer and marketing specialists to correctly evaluate Aesthetic functions. The buyer can and will associate costs with Aesthetic functions. Examples follow:

A buyer was buying OFF-ON switches for television sets. As he discussed the function of the switches with the supplier and asked for means for achieving the circuit opening and closing function reliably at lower costs, he was told that costs on the quantities he was buying could be reduced $25,000 per year if he would end the PUSH-PUSH requirement and use PUSH-PULL. Instead of a push to turn it on and another push to turn it off, the suggeste switch would be on when pulled out and off when pushed in. The quality would

be the same, actually it would be the same switch but with a simpler mechani
The buyer had established the cost for the Aesthetic function. He took this
knowledge to the sales manager and pointed out that the $25,000 per year was
being paid exclusively for an Aesthetic Function, that the purpose of Aesthe
functions was to cause the customer to"buy this one", instead of a similar o
without the feature, and that he needed guidance.

In a few days the sales manager replied that one of their marketing peop
thought it was a little better to have the PUSH-PUSH switch, that some other
doubted it. He said that for $25,000 per year, they would develop the facts.
In a sensitive customer show room they carefully set up a test which would
show which sets the customers bought and why. They ran the test and took da
for a month, recording actusl facts about customers reactions and choices.
Then he reported back to the buyer. "In the entire month, we did not make a
sale because of that type of switch. Dont buy any more, the papers are comin
through/to change that to the PUSH-PULL and knock off the $25,000 per year o
to you
wasted cost".

The buyer had identified the Aesthetic function, had evaluated it, had
provided the knowledge to the appropriate people, and improved earnings, jus
as he would have for a Use function.

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USED OCT 1980

EFFECTIVE MANAGEMENT PEOPLE SUPPORT EFFECTIVE BUYERS

"The biggest sure-fire contributions I make to our companies profits are when I elect once in a while to get into a purchasing situation", a staff engineer of a relatively large successful industrial business, told me. "What are you telling me?" I asked. He said,"our buyers just do as they are told. If they have a supplier they get quotations and place the order. Only time we get into it is if the vendor doesnt meet the specification or th quality. Our buyers dont study into what they are buying. It would make us a lot of money if they did".

I asked, "would you like to have them 'get into the knowledge' about the important items bought. Would you like to have them ask about functions want how those functions are secured and oftentimes one or two alternative ways th functions might be developed. Would you welcome those questions and help them or do you really prefer to have them follow the established routine and only call you in when there is a problem." "I find", he replied,"that I can and do often reduce our costs by five figure amounts whenever I get into the purchasing de tails. Since our buyers dont get into it, I dont think we have personell in our purchasing Dept. who could carry the ball. But, we need them. I wish we had them".

His desires are important,and productive for us. His beliefs are based upon his experience, which is not the same as mine. My experience is that in buying operations of any size, say from six buyers up fully one half have the ability to increase the benefits to their employer from their buying work fro two to five times. What must happen so that buyers with such ability will in crease their contribution? Try this checklist.

1. The buyer must have a real desire to increase his/her contribution. Its comfortable to follow the well trodden paths, to clerically place orders with established suppliers, to accept their stories of escalation of costs. C if the buyer has real desire to bring more benefits to his operation will he summon the energy to say "No", I can get what we need at lower costs, then fa the uncertainities and extra work of achieving it.

2. Management - preferably top management down - must clear the way by wa ing the buyer to markedly increase achievement, and must clearly communicate that wish through to the buyer. Such communication will include an understand that to achieve greater earnings productivity, the buyer often needs some new help, such as specific training, wider scope, fuller confidence, and the opportunity to be thoughtfully heard when a part of a new problem deserves hel

3. Get more of the specific training needed. So much has changed. So much

is new and different and sometimes fits the buying situation. There a different manufacturing,selling,packaging,marking,shipping,stocking,testing, accounting,engineering, or billing.options. Some successful suppliers of the past are, through lack of change and vigor in meeting changing conditions, go down hill and will carry the un-alert "habit order placer" part way with them It requires desire,energy and technique to find the vigorous,competitive supp whose products and systems today provide more to the buyers employer. As nee for buyer training grow, seminars to fill those needs develop. Enroll. Learn

4. Determine to start learning and using the Value Analysis Function buyi Techniques. Learn to understand and buy what is really wanted - functions. As a starter, develop skill in the 10 specific function buying approaches lis in the proceedings of the Society of American Value Engineers.

4.1 Purchased Part Function Analysis.

4.2 Purchasing Particle Function Analysis.

4.3 Purchasing Specification Purchase Analysis.

4.4 Purchasing Aesthetic Function Analysis.

4.5 Additional Cost Function Analysis.

4.6 Supplier Manufacturing Cost Function Analysis.

4.7 Functioning Product Function Analysis.

4.8 Supplier Manufacturing Process Function Analysis.

4.9 Non-working Cost Function Analysis.

4.10 Combinations of the above, for example:

4.2 Purchasing Particle Function Analysis, and

4.3 Purchasing Specification Purchase Analysis.

and

Example of Buyer Having Desire, Support/Function Buying Training

80,000 special multi-part metal dials were needed for a large order of continueing production. They were costing $1.80 each. The supplier said he could quote no less even tho the release was much larger. $144,000 procureme The project manager, instructing the buyers, said,"We quoted mighty tight in order to get that job, Dont sacrifice quality, but lets get some cost out of

The buyer set up a meeting at the manufacturing Company's plant. Meanwh he studied the dials from a viewpoint of functions and of manufacturing cost He determined that functionally, the product was just about as simple and we concieved as could be. He also decided that, if efficiently manufactured, co of making would not, by any means, support a selling price in large lots of

In the buyers training, he had learned to first make sure the situation wa right, then squarely lay the facts, as he saw them, on the line, with no doubl

talk, and to accept no double-talk in return. He told them:

1. They had been a good supplier. They were dependable, quality was good, the dials performed as needed. He would like to continue buying of them.

2. He had studied the functions of the dial, which were very simple, and he believed there was not wasted material or labor in their design. It was g

3. He had secured a rough build-up of manufacturing costs from a methods The estimates showed even un-expectedly low manufacturing costs. In fact, low enough so that it could be sold at a good profit for 1/3 the $1.80 price - 6 He suggested the price of 60¢.

The supplier responded that they had no quarrel with his figures on manufacturing costs, but that it was a patented item, that others could not make hence their selling price of $1.80.

The buyer secured the name and address of their patent attorney, and the meeting ended. Back at the plant he provided the information to his own pat attorney and asked him to assess the validity and importance of the patents. In a few days his patent attorney called, saying, "I've been in touch with t suppliers patent people. The patent covered a minor detail which was relativ unimportant, the way the dial was used. I've talked to our engineer. He says "It would be simple to make the item without using that detail." The vendor n quoted 50¢, which was accepted. For the buyers extra work - an extra $80,000

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WHERE DOES THE BUYERS JOB BEGIN

Some questions were brought into clear focus by the buyers work reported last month in which, changes in design, improvements in manufacturing and ending of $37,000/yr of non-contributing costs resulted. Those questions are pertinent and deserve thought.

Q. If the buyer does so much engineering work, shouldnt he be on the engineer payroll? A. He didnt do engineering work. He did purchasing work. Through his function knowledge he saw that he was spending money which brought no wanted function into the company. Through his vendor knowledge he saw probabilities for improvement. He then communicated to the technical people the dollars which it appeared could be retained, and the vendor processes which might do some of

Q. Didnt the buyer, in reality, do the design,manufacturing and tool engineer work? Wouldnt good engineers have already had those parts designed so that they would nest, and the tooling built so that there was no wasted steel?

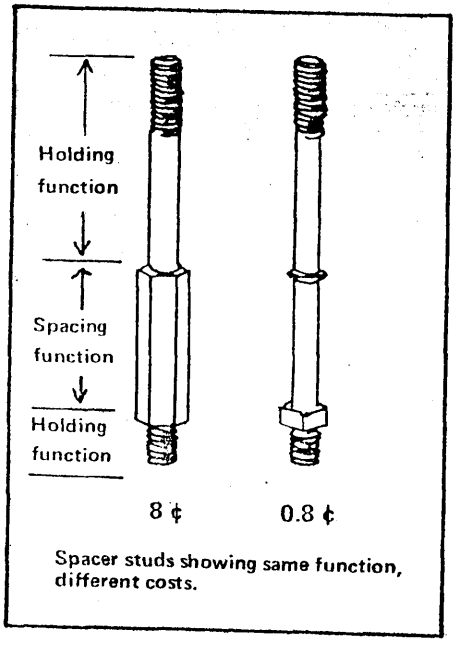
A. No. The grade of the engineering work was normal. The product they made won its share in competitive commercial business. They used the knowledge which they had, and the creativity which they saw fit to apply. They,at the time of design felt that their contribution had been adaquate. The part worke

It was made of standard and available material.It was made by standard and available processes on available equipment. Other parts and assemblies were not yet designed and needed their time and attention. This one did not,so it was drawn up and the tooling made.

Q. If /, as you say, the buyer did not do the engineering, exactly what did he do? A. He provided knowledge and motivation. Knowledge that over $1000/mo. appeared to be within grasp, and the first step toward getting it - reduce that wasted steel. Engineers cant know everything. They cant necessarilly think of everything. They dont have time in a well balanced organization to work on everything - only important things. Its the buyers job to help them with knowledge, to help them with creativity and with motivation, never by attempting to do their job.

Q. Wouldnt this type of work embarass the engineers, the Mfg. engineers, and the methods people, one by one, so they would stop working with the buyer A. Yes it does embarrass them at first. The amount depends upon the understanding of their boss. In the example

of the spacer stud reported in PW March 1978, technical people helped develop and approved the change from 200,000 8¢ parts to 200,000 1¢ parts adding $14,(per year to earnings. Sketch is reproduced. Note the temporary embarrassment.



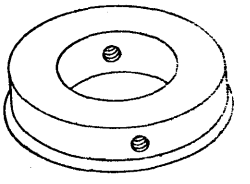
Spacer studs showing same function, different costs.

When the manager saw this work and absorbed its impact, he reacted,"What d we have in our design and manufacturing engineering departments, men or boys?" It was instantly embarrassing and indicated that he had much to learn about t effectiveness of the VA Function Analysis approach. He learned fast and added training together with two more people to do this kind of work. No embarrass after that!

Now, for more answer to the same question, No. Engineers like to do a goo job, to do things they are proud of. Since this encourages them to use creat- ivity, to gather more knowledge, and to know how to do a better job, they lik it. Experience shows that when they find a buyer who can "talk their own lan- guage" so that they can contribute more, they are "available"and ready to participate.

Q. The buyers extra contribution, either on the shift lever of last month or the spacer studs shown here,consumes a lot of time, at least several hours scattered through a couple of weeks; how is a buyer going to get his other essential buying done? A. Buyers and their managers will put real thought into separating out the routine work from the potentially profitable work. It is absolutely necessary in a competitive business. It is very desirable in other buying operations. Buyers will then have the proper amount of productive work and the proper amount of productive time.

Today's Example of the Use of VA Buying Principles



Steel Flange $2.00 each

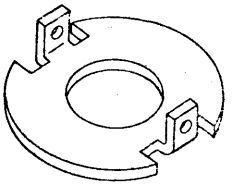
General knowledge - 1500 per year Made from steel bar, by machining and turning and drilling and tapping two mounting holes. 2" dia. x 1/2" thick.

Function knowledge Holds Calrod heater loosely through a clearance hole in the side of an electric furnace. Temperature not over 150°F. No vibration, A stationary part. Removed perhaps once per year.

Function Analysis - Very heavy steel to hold a 2 lb Calrod. 9/10 of the steel particles are not working. Machining out / the large center hole and the material to leave the flange around the circumference are costly operations. Probably should be made of a piece of sheet steel with no machining excepting the tapped holes for mounting.

Action - Talked with engineers about it. They said 1500 quantity was too small to afford tools for stamping, otherwise thin steel approach was good. Got rough sketch from engineer of what thin metal piece might look like. Sent it to"Low Quantity"stamping specialist.

Result - One time tool cost of $100. 1500 parts for annual production then became 20¢ each, $400. total instead of $3000.



20¢ each

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THE BUYER PROVIDES KNOWLEDGE, CREATIVITY AND ACTION

"Why would I want a constant tension spring", a buyer asked. "Because it will make some of your products function a little better", the Spring Co. salesman answered. "It will mean better functioning products and in some cases, lower costs". Of course the buyer said "tell me about it".

What followed brought a little better products and a lot more earnings. First, basic knowledge was brought into clear focus. Springs are usually either compression or tension. Compression springs operate by pushing things apart. Tension springs operate by pulling things together. Always there is a need for controlled movement to be allowed. This is usually done either by coiled spring wire, or flattened spring blades. In all cases care must be used not to stress the material beyond its elastic limit, or the spring is destroyed.

Size varies. Resistance to movement varies. Coiled wire springs may be ½ inch long, or 6 feet long. They may be made of wire the diameter of the human hair, or the diameter of the human arm. Tolerance of environment varies they may be made of spring steel, spring bronze, or even filaments of glass.

One deficiency, however,stalks all kinds and styles of springs,and all spring materials. The force which the spring exerts to return to its unstressed position continually changes as the distance it is stressed from its neutral position is increased or decreased. So, if it is a compression spring, the amount of pressure it exerts keeps increasing as it is compressed. If it is a tension spring the "pull" it exerts keeps increasing as it is further pulled or extended.

Is that bad? The buyer reasoned that in some applications it must be bad, that the engineers would prefer to have an optimum push or pull regardless of the position. So he"listened" to the salesman. A new type of spring shape had been invented and was now being manufactured in a large variety of sizes and materials, which was constant tension, or constant pressure thruout its entire range. Samples were already available from the tiniest sizes up to several feet long.

Fortunately this buyer was trained in dealing with functions and function-cost relationships. He saw the possibility that in a few cases, new and better functions could be accomplished, but what about costs? He asked to see some comparisons of costs in the made up samples. What would the usual type of spring function cost? What would the constant pressure spring cost.

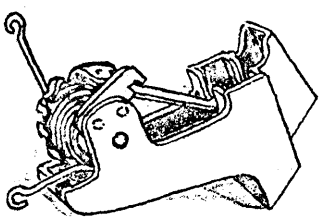
Would it be applicable only in products where more cost could be absorbed for the "springiness function"? He was shown several examples in which although the new spring,alone, cost more than the replaced conventional springs, the means for mounting and for use were so simplified, that lower total assembly cost resulted. By now he had developed general knowledge, function knowledge and cost-function knowledge. He was ready to act, and creativity would be his next action. His experiences on one application will be related.

He asked the design engineer in the large motor and generator operation, where a constant tension or constant compression spring might be used to advantage. At once came the reply,"To mount the carbon brushes on our dc motors and generators". He was told that these equipments all have commutators on the rotors, and it is necessary to press a piece of carbon against the commutator bars, as they turn, to pick up the electricity. It is quite a science to have carbon, not too hard, or it wears away the commutator too rapidly, or not too soft or it wears away the carbon pieces, requiring replacement too often. Then it is very important that the carbon be pressed against the rotating commutator at the optimum pressure. Pressed too hard results in excessive wear both of the carbon "brushes" and the commutator.

Pressed too loosely results in excessive sparking, with a variety of problems. Precision research has determined exactly the optimum pressure. Even then the brushes wear away, and new ones must regularly be installed. To minimize maintenance these round or rectangular shaped carbon pieces are often made a few inches long. A spring presses them against the commutator, and of course follows them down as they wear away, diminishing in pressure somewhat as it moves down. To minimize this change in pressure a spring wire as long as practical is wound and used. Constant pressure is the ideal. It is not secured, but is approached. Certainly,a constant pressure spring holds great interest for the application.

The example; The brush holder was about the size of a mans wrist and fist. Its structure was of cast brass with certain machining operations. It mounted a spring and arm to press down the carbon brush. 20,000/yr cost $9.20 each, $184,000.

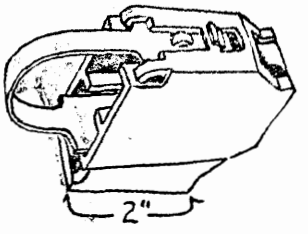
The brush holder,without brush



$9.20 each
It consisted of eleven parts

The motor engineer, the spring engineer and the foundry engineer saw probabilities of creating a better product at about half of the overall cost and worked it out.

The new brush holder, without brush



$4.00 each

Two parts. The holder and the spring

A little better function performance and $5.20 each, $100,000/yr of additional earnings resulted from the work which the buyer initiated.

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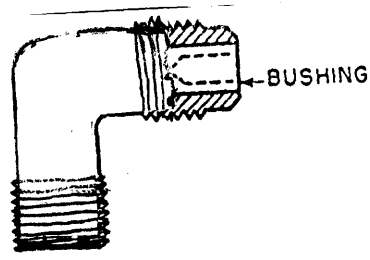
PUTTING THE BEST NAME ON THE FUNCTION YOU ARE BUYING MAY GET YOU $1000 OR MUCH MORE

Buying functions sounds strange and naming functions is often difficult for the buyer who wants the productivity of the VA buying techniques but has not yet had training or experience. We'll have a few excerises in naming functions. It is sometimes very difficult. It is often very important. Consider the small brass elbow assembly. The buyer bought 200,000 per year at a cost of 30¢ each, $60,000.



Brass Elbow Assembly 30¢

First, what is it and what does it do? It mounts on the pressure tank of a small air conditioning pump equipment. In operation it provides mounting for a copper capillary tube which goes to an instrument. It is,then, the connecting member that allows the small capillary tube to be attatched to the pressure tank.

I will recall some of the discussion as the buyer worked at identifying and naming its function, or, in this case two functions. The functions to be named are what are called the Basic Functions. What causes the user to want t part, and exactly what does he want it to do? It soon developed that there are two basic functions. 1. Provide means for fastening the capillary to the tank./ 2. Since it is an elbow, to also provide a right angle turn so that the capillary will be pointed upward toward the instrument

Thus far an understanding of the part and what it does has been brought ir view, but no clear,thoughtful function naming which would help to buy the pa most economically has been done. The functions are to be named clearly in tw words,a verb and a noun. The value, or appropriate cost for each separate fur ion is to be established by comparisons to differing,probably suitable, means of performing the function. The value,or expected appropriate cost of the com posite,which would perform both functions, is established. After this the buy can start his buying work. He knows what it should cost,and he has many ideas of how it might be done.

Now comes creativity.The name of the first function is created and chosen. Some of the posibilities suggested follow. Join Capillary - fasten capillary secure capillary - connect capillary - attatch capillary. No new ideas were coming forth. They all meant about the same,so "Connect Capillary" was used.

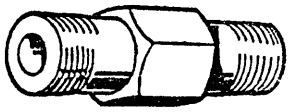
Now, what is the value of that function? What is probably the lowest cost,full quality, way to do it, and what would that cost? Discussion and a few phone calls brought what seemed, at this stage of the thinking, to be about as good as available. It would be a small very simple, straight brass fitting with thread at one end for mounting into the tank, and suitableshape on the other so that the capillary could be secured in it. It would cost 11¢, $22,000 per year. So the value of the first function was considered to be 11¢, and attention was turned to the second function.

Naming that function was difficult, which is often an indication that properly understanding it and naming it will yield cost benefits. Creativity started. Direct capillary. Direct capillary upward. Direct capillary to instrument. Provide right angle turn. Redirect / capillary. Accomodate assembly. Facilitate assembly. Then came the name that was seemingly ridiculous, but was the winner - it caused straight and practical thinking. Bend gas (Freon)

The equipment engineer was in the group. He caught the spirit and tried to help in the naming. When "bend gas" came forth he laughed, then soon said "Thats the one.Thats what we're doing. We're bending the gas and sending it up toward the instrument. Actually there is no better way to bend gas than

in a small capillary tube. We dont need the angle in the fitting, we'll just bend the capillary upward."

Working at naming the second function had brought forth the reality that the right angle bend in the brass fitting did not supply a wanted and needed function. Therefore the value of the second function was zero, which meant that the first function value of 11¢ was the total value of the item.



Modified Brass Fitting 12¢

Now the total usable part could be automatically made on the screw machine instead of three operations,making the elbow,making the insert,then joining th

With all information in, and a new specification, cost became 12¢,or $24,000 per year instead of $ 60,000. Everyone was happy and $3000 per month was left in the bank, because of the buyers extra attention.

The purpose in relating this example is threefold. First,to show the vital importance, if extra buying profits are to be made, of identifying and naming the functions. Second, to provide a first lesson in showing how to do it. It is not easy. Only with knowledge,conviction and technique is it done. Third, to show how a different point of view is often produced

which clearly shows costs which are contributing to no one. Usually,unless competition, or a pressing need for more earnings, exists these looks from a cost/function point of view are not taken. This product was a normal good design, produced by normal good people. As the designer provided means for connecting the instrument capillary to the tank, since the instrument was above the tank, and would fasten to the side, it was normal to use an elbow fitting which started the capillary up. It looked good. It performe well. No one erred. But today is a different day. Products have matured. Competition has increased. Peoples money is progressively losing its buying power. To achieve the functions - both USE and AESTHETIC - for near what the need to cost is often vital. The buyer who can build cost-function relationships, can identify, name and evaluate functions, is becoming ready for today and tomorrow.

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UNDERSTAND THE FUNCTION, THEN YOU CAN NAME IT

Why do some buyers, sometimes, create unexpected five figure additions to earnings? What can he and/or his manager do which will cause it to happen more often? How can the thinking and the action be produced which will allow less of potential big earnings boosters to "escape" unknown and undeveloped?

A dozen or more learnable specific actions in the VA Purchasing Principles are used to minimize the "escapees". One very effective action was introduced last month, and because of both its difficulty and its importance, will be extended. After identifying the functions the user wants, name each function in two words, a verb and a noun. Last month the surprisingly appropriate name, "bend gas", produced thinking which had never before been done and resulted in the same high quality finished product with $3000. per month lower purchase cost. Why does it happen, and how can we make it happen oftener?

The answer to the first question is clear. It produces different thinking it produces better more realistic understanding of just what action is wanted by the function, it often surrounds the problem with a different group of alternatives. Because something new has been added, more effective choices can often be selected. The choices may come easy, after the difficult naming job

has been well done.

"How can we make it happen oftener" is much more difficult. It is by developing skill in function naming, and by always doing it. Some guides follow:

* What, really, is the function that the customer or user wants?
* State the function in exact sentences. Examine the sentences.
  * Is that exactly what it does for the customer?
  * Is that exactly what the customer wants it to do?
  * Is that exactly what the customer believes he is paying for?
* Improve and clarify the sentences until they say exactly what the function really is.
* Then describe what is done, and name it with a verb and noun, for example, actuate switch, support contact, enclose volume or radiate heat.

While it appears simple, the exact opposite is the rule. Naming functions accurately is so difficult, requires so much exact knowledge of the function, and requires such creative and precision thinking that real care must be taken to avoid abandonment of the task before it is fully done. Because it is a technique which was brought into being by the VA system, few can help in learning it. Teachers of the system and professional CVS's can help. We're trying to include

enough valuable training material herewith to help.

More guidance follows:

* Avoid such nondescript words as "provide",name it for what it does.

* Meaningful verbs are similar to these - Contain,move,shorten,support,protect actuate,control,modulate,radiate,secure,locate,rotate,insulate,ignite,mount.

* Meaningful nouns which are used after any verb (try them) are - Piston,dust. contacts,torque,switch,volume,current,panel,paint,air,noise,vibration,flame.

Buyers have previously learned that there are two tyoes of function -USE. and AESTHETIC. The above guidance applies especially to USE functions. It is important to clearly identify AESTHETIC functions as well - and to try to name them. Because they are basically subjective, it is often much more difficult. Since AESTHETIC functions are for the purpose of causing the customer to buy this particular product / , the best that as yet has been developed for naming them is often to reduce noise, reduce size, provide color,provide convenience et The buyer should not be discouraged if he cannot find definitive verb-noun names for AESTHETIC functions. The "state-of-the-art" of naming has not yet progressed that far.

Often the buyer is astonished at the ease with which properly named functions can be bought at startlingly lower costs,as the following example shows.

A new laboratory under construction, was to contain a very powerful X-ray equipment for finding flaws, if any, in large castings and forgings. To prever injury of personell in nearby buildings, a semicircular wall of concrete 14' high and 7' thick was specified. As the construction of the laboratory proceeded, it became time to construct the concrete wall. The works manager, with responsibility for proper use and care of all of the real estate in the area refused to initial the concrete wall drawing. He told the laboratory manager that he must first have a written note stating that "if they at some future time decided to move the laboratory, he would take out the concrete".

This referred the matter back to the construction buying team, one of whom had completed basic training in VA approaches. Their instruction was to resolve the situation and get construction under way. Function identificatic and naming were to become stepping stones to the solution. Some of the dialogue follows. Questions were asked by the team,which worked at not only ider ifying them but at correctly naming them.

Q. What is the function of the concrete? A. To protect people in adjacent areas.

Q. Obviously that is not a definitive answer. Dozens of ills might happen to the people. This does not protect them. Exactly what does it do? And how

does it do it? A. It prevents injury from X-rays.

Q. How does it prevent injury? Exactly what does it do? A. It prevents injury by stopping the radiation, by absorbing the energy in the radiation.

Q. So that we can consider clearly what it has to do, let us name it in two words, a verb and a noun. What best says exactly what it does? A. Absorb radiation energy, block radiation, stop radiation, and similar.

"Stop radiation" was selected as being accurate enough for non-technical use.

Then followed creativity on "what else will stop radiation". The answer came forth, "anything, if you have enough of it". Air,water, wood,sand, rock dirt,lead, steel,copper, or whatever. Air would require a few thousand feet Lead would require a few centimeters, concrete 7',everything else in the ran Q. How much dirt - the soil like we have all around, would it take? A. We'll test some samples, then answer.

Tests showed that 14' of the available earth would stop the same X-rays as 7' of concrete. Specifications were changed, bids were received and the order was placed. Instead of the $50,000 which was quoted for the concrete, costs became $5000. for the wall plus $500. for planting and landscaping.

Clear thinking was easy, once the function was properly identified and named with a verb and a noun.

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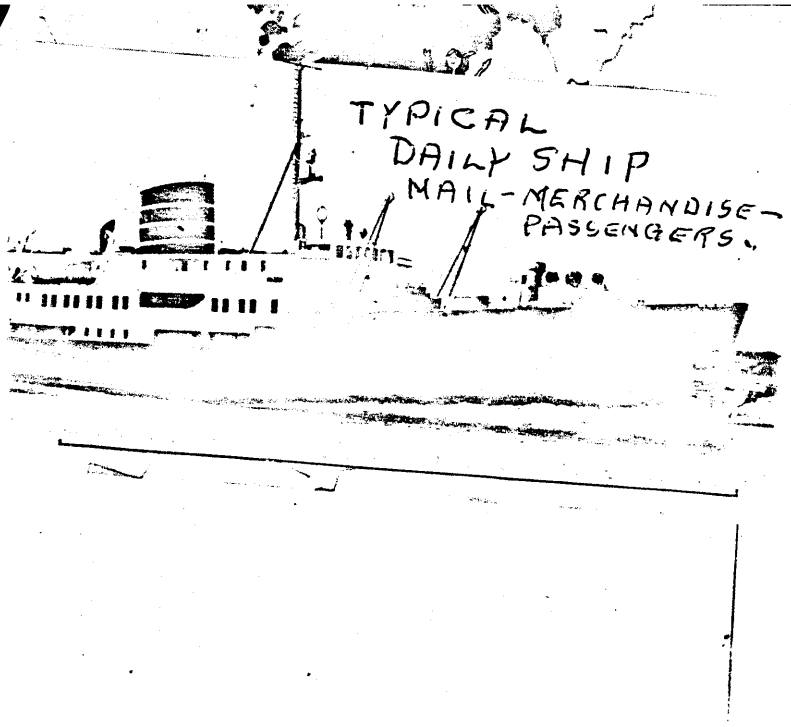
TYPICAL
DAILY SHIP
MAIL-MERCHANDISE-
PASSENGERS.

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Written Nov.1981
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NEW MENTAL "SEED MATERIAL" STARTS NEW THINKING

As our medical scientists learn more about the operation of the human brain and more about the near-miraculous computer sciences, they are finding great parallels. For example, something starts thinking,something channels it, something guides it into certain paths, something keeps it away from certain other paths, something sometimes promotes randomness, something other times prevents randomness. Does that effect us, as buyers? Very Much.

In meetings with buyers, I am startled, and actually thrilled to learn the circumstances of superior buying and the large dollar benefits they are bringing to their employers. It is a surprising and challenging truth that most could have been accomplished months or years earlier in the design life. They are not the result of a new material, or a new machine or a new process. They are the result of new thinking. What starts this thinking? What could start it sooner?

With the computer, the first action is to touch a key which identifies the type of knowledge wanted. In our Value Analysis system, the first action in the "Job Plan" is to identify "exactly what am I trying to do?"

Two or three more keys, successively touched, bring into review all of the knowledge in the computer, subject to restraints programed in. The human mind seems to act in great parallel, excepting that it is often self-programmed with drastically more restraintswhich prevent specific kinds and types of mental activity. Achieving remarkable results from the actions of the human mind seems often to require three types of input.

1. Purposeful direction.
2. Specific input which sets forth an area of probable benefit.
3. Some factor of training or environment or self-discipline which will minimize or some end/in-programmed mental activity restraints.

Studying some spectacular dollar achievements of some buyers, from the viewpoint of identifying areas,as in #2 above, where mental activity may now yield additional earnings,some specifics have been developed and are here presented. The buyer who will allow his mind a few minutes or a few hours, as the case justifies, to scan his important specific purchasing arrangements with each separate approach in mind - <u>one approach at a time</u> -- <u>one procurement at a time</u>, will probably find some sources of additional earnings. In each case he will strive to recognize, understand and minimize the restraints which have prevented objective thinking.

than the buyers have

* Vendors always have more knowledge/about the products they supply.

The motor supplier knows more about possible quality deficiencies,possible changes to improve efficiency, areas in the design that are out-moded, costs because of the way they do it which experience has shown do not contribute to quality or quantity. The chemical supplier knows more abou the adders which might cause the material to go twice as far in your applicat ion, the other chemical which would cost less and do a better job, the different viscosity you might use which would lower your costs. The buyers who understand and talk "function" and who agressively and progressively learn more from their vendors finds unexpected opportunities to add earnings.

* Handbooks and catalogues tell not more than 75% of the whole story. They are a vital source of generalized buyer information, a first step in knowledge gathering for the productive buyer. They are a starting, not a stopping point. Consider the buyer who found that five 300 foot lengths of 2"x $\frac{1}{2}$" copper buss were being purchased, then in a very elaborate set-up silver braized into one length for the winding of large waterwheel generato The handbook said "300' is the maximum length". Purchasing believed it. Engineering believed it. Manufacturing believed it. They spent their company's money accordingly, until a buyer said "it isnt right for our situation",dev-

eloped thinking on it, followed up the thinking with action and bought the 1500' all in one piece. On just one production order of 12 the costs eliminated were well into the five figures.

* Price lists are written on the basis of generalities. Specific buying situations are often quite different. Consider which of your buying situatio may differ from the run-of-the-mill for which price lists have to be prepare Cause some new thinking on it. Consider the procurement of very large quant ties of stainless steel roller pins as reported in an earlier issue of PW, (May 1977). The vendor was buying uniformly standardized and priced stainle wire to start his manufacturing process. The buyer started and carried out some new,in depth thinking, about the materials and processes the vendor used. One result was that instead of continuing to buy a catalogue size of wire, then give it three centerless grinder passes to get it down to size and surface finish needed, a smaller size was bought, at the same price per pound, the cost of two centerless grinding passes was ended, it was given one pass, which provided the identical former size and finish. As a result of this buyer-initiated new thinking the finished product was unchanged but the cost was reduced more than $100,000 per year.

More situations to originate buyer new-thinking are listed.

* The vendor often has a better product or material or service for a particular use,however he does not,in useful detail know exactly the buyers need

* Specialized skills,materials and products can often be supplied by the vendor. Too often he does not know precisely of the need.

* Vendors are sometimes unimaginative,continuing to sell their wares"as-i when adaptations would bring the user better quality or lower cost.

* Buyers are limited to using the suppliers they know or can find. New thinking and search may bring better quality or better costs.

* Requisitioners are not infallable. They are normal people, like the buyer. They are much influenced by what they have done before, what the records have written in them and what the specifications from the past say. The buyer can bring new thinking, todays knowledge and todays options which often allow "a whole new ball game".

* The buyer will keep well foremost in his mind that in successful competitive business the vendor must sell for the highest price he can get. The buyer is expected to buy for the lowest price he can get. When the buyer "hangs in tough" it provides better values and keeps the system in balance.

...LDM...

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QUALITY CIRCLES AND VALUE ANALYSIS - part two

When gasoline propelled vehicles first went on the roads in England,a law was made that "--always, a person must walk in front of them down the road." This was understandable. They were something new,something dofferent. The walking person could help minimize, and hopefully prevent, damage from frightened horses. Later, the English, like the rest of us, came to understand the new approach,to minimize disadvantages, and take steps to maximize advantages.

As we look at the relatively new - to us in USA - approach of Quality Circles, let us see what, if anything good they are achieving, then learn how to increase the good,decrease the bad,then help bring purchasing benefits from them.

First, from Japan which has been "growing" them and using them for two decades: The Japanese say that superior product quality is due to the Quality Circle Philosophy. Toyota Quality Circles have developed such vitality that 90% of its customer complaints are given to its Circles for response and correction. They have had a 33% decline in defects per car. They estimate yearl benefits of $3,000,000. Nippon Electric Co.'s Fuchu plant has doubled productivity in three years. Management estimate that 25% was the result of Circle input. Sharp Corp.'s Tenri plant reports productivity up 5% each

month, and attributes much of the improvement to Quality Circle Activity. Nissan Motor Co, with 4000 Circles reports improved quality and other benefits of between $2 and $3 million each year, resulting from their activity. Japan,in total, has about 1,000,000 circles with 10,000,000 members.

Next, experience from Quality Circles as they are being "Grown" in USA: The story of American use of Quality Circles has yet to grow,develop,then be written. Some observations will be included. It is recorded that Honeywell Inc. and Lockheed started a few years ago. Honeywell had 40 QC teams in 1979,100 in 1980,500 in 1981, and expect 1000. Their Avionics Div.reports $500,000. benefits in one year. Another of their plants reports that 12 teams resolved more than 100 operating problems,improving machine utilization by about 30%. In another plant the QC team saved $35,000 by changing the method of wiring a product. In another area the team reduced direct labor hours 46% with a series of proposals involving tooling,materials and test procedures. An hourly worker said,"This is the best thing the Co.nas done in 15 years". An executive officer reported,"Quality Circles have save(us millions of dollars". Vice Pres. F.A.Boyle said, "At Honeywell we believ(in the Quality Circle Concept because it works".

Many American Co.s have tested the water with their toe. Some have dived in. General Electric,Hughes Aircraft,Sperry Univac,Westinghouse,are examples One GE plant has 30 circles. One redesigned its machines drip-pans,saving GE $20,000. Another figured that 50 minutes were lost each day because they had to walk around a poorly located machine. $250 spent moving the machine saved $2500 each year. Another found reworking of parts needed on 16% of production. They set for themselves goals of 10%, then 8%,then 7% and finally 5% for the total re-works. Each week they made their goal they were excused from punching the time card in-and-out at lunch. This helped more than "meets-the-eye" because it put them right at the head of the food line. Hughes reports that, among other benefits, one team netted a saving of $45,(per year from reduction of defects. Another team brought $48,000 per year by assisting in the redesign of sample boards. It seems that usually,when one or two circles are started,results are so good that many others quickly grow Sperry Univac's Bock says "We have 51 circles and I can see that number doubling in the next year".

Why - So Much Benefit From Quality Circles?

It could be that they are correcting a basic defect - filling a basic nee in our production system. Tens of thousands of employees are told exactly what motions to make,and fit into a system that will accept only those motio

"Put these three parts in place and make them fast with this automatic screwdriver. (Then Grab three more parts fast)". Only certain body muscles are used and usually none of the brain. The problem is that most of these are resourceful persons. They are doing their own plumbing,building another room on the house,overhauling a motorcycle,landscaping a camp or building a boat. At work, they are bored almost to the death. They often see how the jo could be done better and faster and be more fun to do.But - "no use".

For example,I asked a friend who is a welder to tell me about his work. He said,"I weld several steel parts into an assembly. They came and timed me. I put it together sensibly and worked an hour on each assembly. They set the rate at one per hour. Of course when they are gone I do it a different way which results in the same good job in ½ hour. Its more fun to go right at it and do it the right way. I take lots of time off but always turn in my quota I asked a personal friend who was an assemblyline worker to tell me about hi work. He said,"I like the night shift. There are ten in our assembly group. The job was timed and the rate was set at 90 per hour with 10% bonus if we did 100. We can easily do 200 per hour. We work along an hour or so until the daytime supervisors are gone, then we do 200 for a few hours to make our quota. Then, each of us have found places in the plant where we can sleep - so we get several hours of sleep each night. We turn in 100 for each

The Suggestion System has tried to help, but only gets the tip of the iceb Quality Circles put the employees and the company on the same side of the sam team, an enormous benefit for both. In the Circle meetings employees express their ideas,thoughts and knowledge about how to make the job go smoother, faster and better. They know their thoughts are wanted and that workable ones will be used. Productivity,quality and the quality of working life are much improved.

How does the Productive Buyer Relate to Value Circles?

Frequent new benefits are available to the buyer. Get involved with the Circles or individual members. New practical useful knowledge, from a different viewpoint is there. They are a team "right at the heart of what really is happening", and like you, want to benefit the company quality-wise competition-wise and earnings-wise,

Get invitation to their meetings occasionally. Listen, learn, dont talk. With the knowledge gained and broad buyer access to vendor materials.process and skills, the buyer can develop and offer better, less costly means of getting done what they want to do. In time, develop rapport with one or two of team members. Learn what they need and help them find it.

As time goes,develop opportunity to teach them function-based thinking.

...LDM...

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USING VALUE ANALYSIS PRINCIPLES ON A LARGE PROCUREMENT

To deepen the buyers understanding of the Value Analysis buying principle available to him, an example of their use on a recent very high-dollar purchase will be provided. The same essential six-step VA-buying system, shown in PW last month will be illustrated.

Step 1. Get Understanding of the Situation

Great destruction of life and property in the state of Washington, was don every few decades by a disastrous flood. It could be prevented by an enormo dam. After years of wishing and wanting and planning, the money was made available and procurement proceeded by the United States Corps of Engineers. It would be 1700' long and 200' high at its highest part.
Design was completed, bids were secured and the contract was placed. The cos was to be $24,000,000. Three years would be required through completion.

Now enter Value Engineering and Analysis. For years knowledgeable people have been promoting the viewpoint and causing the requirement that on very large expenditures of tax-payers money, at least a minimal look-see must be taken using the VE methods. $40,000 was assigned for the required Value Engineeri study. Its operation was to cut 1/3 from the procurement cost and 1/2 from the construction time.

Step 2. Understand the Function

In different jobs,vastly differing amounts of work are needed for the various steps. The basic function of the dam was well known. To meet the total need much attention was given to the various constraints which were essential to permit the dam to continue functioning and withstand all of th conditions nature might give it. Some were: Stop floods, provide irrigatio resist aging of its own materials by the processes of environment and resist weather shock.

Step 3. Develop Function/Cost Relationships

The team using the methodology,developed function costs, and alternative function costs. They determined where the important costs were going and exactly what functions they were contributing. One very important functior cost was the pouring,settling and setting of the concrete, which is here selected for further comment.

Step 4. Compose and Write the Main Problem, which,if Solved,would bring Much Benefit

One problem they prepared for innovative thinking which follows was "How might we get that concrete in without the traditional enormous costs?"

Step 5. Creativity and Innovation

The knowledgeable people on the project searched the experiences of themselves and others, then extended their creativity beyond their experience.

Step 6. Select the Best Option and Take the Best Action

They selected an option never before used by the Corps of Engineers in dam building, but which basically seemed a winner. They gathered knowledge and experience on it. They tried it out. It worked. It was tremendou It elimdnated materials,time and cost. It yielded a dam structure of equivalent properties and qualities.

It was roller compacted cement. It used equipment which is readily available, and technology which is well known in other fields. Its benefits were so great that it advanced the art of dam construction.

Many benefits resulted. Three will be listed.

1. The cost of the dam was lowered from $24,000,000 to $16,000,000, leaving $8,000,000 unexpended.
2. The time required for construction was reduced from 3 years to 16 months, getting the dam into use much sooner.
3. Shortening the period of construction from 3 years to 16 months saved the Corps of Engineers extensive supervisory and inspection

and other costs which they estimate to be in excess of $2,000,000.

In summary, the small amount of money which was spent in causing the Value Engineering and Analysis methodology to be used on the procurement, resulted in benefits of $10,000,000 to the buyer.

This magnificant benefit to the purchaser - The Corps of Engineers of the USA - resulted because the top and middle management together with the professional employees were united in their determination to provide the most benefits to the tax-payers for each dollar they spend, because they have learned that the VA system is germane to that purpose, and because they enthusiastically maximized each opportunity presented.

...LDM...

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TELL YOUR MANAGEMENT

We all may be making the mistake of believing that our management "feels" about the same as we do about the things that increase quality, increase earnings and increase our market share of our business.

What our management believes positively determines what we may do and what benefit or injury results from it. Do you know what your management believes about your Value Analysis Principles? Have you told them? Have you shown them the method and the results? Dont assume. Because you know the benefits to the company, is not the slightest reason to believe that they also do. Now read this which appeared in a recent issue of a well-know design magazine.(1)

The president of a successful American Corporation, in a 1982 article promoting quality made a statement about Value Engineering which is here quoted.

"The more pressure generated to produce faster and faster,the less accen on quality and product reliability. In its heyday,this approach was called Value Engineering: shave a little here, a little there; use a scrap of

wire instead of a fuse; rivets,not bolts; use cheaper materials; make the classic 'two-by-four' piece of lumber still smaller; put fewer snaps on the jacket and eliminate the zipper. But, whatever you do, turn out more produc Not necessarilyy better, just faster." End quote.

Are you astonished? I am, and it teaches us all a great lesson. No one has told the company president what the methodology of Value Analysis and Engineering are. This corporation president has been one of the delegates to the White House Conference on Small Business, a member of the U.S.senate small business task force, a member of the board of directors of the local Chamber of Commerce and other leadership activities.

The presidents article relates the great strides made by the Japanese in improving quality,productivity and competitive costs,and the results. "In 1952 Japans GNP (gross national product) was 1/3 that of France. By 1970 it was more than the GNP of France and Britain combined,and it is now half that of the United States. Steel output in Japan last year was 112 million metric tons; the United States produced only 101 million. Of the worlds twenty two largest and most modern steel plants, Japan has more than a dozen - the United States doesnt even make the listing. When you compare

production figures,as well as import and export stastics,critically,you may begin to wonder why the United States, with its lono technological heritaoe and its expertise, has fallen so far behind." End quote.

The president apparently did not know that many of these tremendous Japanes achievements were accelerated by the effective use of the VA Methodology. A few examples are

1. The Japaneese sent scores of men to this country to learn the Value Analysis and Engineering methods, then, as is their practice,improved

2. When, in 1961, the book TECHNIQUES OF VALUE ANALYSIS AND ENGINEERING by Miles first told the world about Value Analysis approaches and how to use them the Japanese at once translated and published it in their language. Thousands were used thruout Industry to bring better quality and better costs.

3. They then learned from experience that the Value Analysis methods helped to improve management processes and achievements, so they organized a society to help company management and employees benefit from the methods. It is named the Society of Japanese Value Engineers. Membership is companies, not individuals. It promotes the use of the VA methods to achieve better innovation, better quality and better cos On two occasions I have accepted their invitations and gone to their Tokyo meetings to tell them more about it. In both, attendance was 70 the capacity of the auditorium. They listen.They learn. They use.

4. Now, the newer, more knowledgeable 2nd edition has been translated into Japanese, and we have reports of hundreds of copies being used in various areas of steel mills, automobile factories and other industries.

Why was there no mention of this by the company president who extolled the achievements of the Japanese, then drastically downgraded the system of Value Engineering which so importantly helped them to secure high qualiti and competitive costs? The answer is simple. No one had told the president!

The president and other top management are searching for truth. They want to know what is real. They know their success comes from knowing and acting upon what is real. Their information sources are varied. Their time is fully absorbed. There is no reason whatever to believe that they have the correct basic knowledge or understanding about the effectiveness of the VA methods and principles.

Conclusion. Tell management. What they dont know, they cannot draw benefit from. Show them the methodical approach which combines an exact sense of direction,current and new knowledge, and effective innovation.

...LDM...

(1) DESIGN NEWS Magazine, 1-18-82

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Written Apr. 1983
By L.D.Miles

SUPERIOR CREATIVITY OFTEN BRINGS PLEASANT SURPRISES

As buyers are more and more using their VA proceedure skills to bring their employers extra benefits, it is observed that the whole system, including the use of good Creativity and Innovation procedures is essential. Heavy study of "What are we trying to do?",before receiving too much fixatio on "What we are doing", often sets the task up for superior creative attentic

Useful creativity can come in many forms, but the planned development of superior innovation is the result of skillful use of some established proceed ures. As soon as the buyer has determined what he wants to do and has put it into words ready to promote creativity - "HOW MIGHT WE shield that belt for $1 instead of $2." special creative proceedures, fully used, will greatly increase results. Those proceedures include a period of absolutely free positive thinking for a period with all judging deferred, writing down every thought, no matter how far-out it will be when judged, then inspection of the list while still in the positive frame of mind to add a few items, which the

listed ones cause to come forth. Effective creativity may come from any group of all positive people, or it may be achieved by a single person, in an undisturbed environment.

A professional teacher of creativity related the experience of one of his students, a buyer, which communicated well and is worth repeating. He said the buyer received a requisition to buy one ton of spent newspapers, written in a foreign language. So that he could most assuredly get what the requisitioner really wanted, he asked him what he needed. Was size important? Was black print or colored important, what other factors were important? The Story developed.

One of the groups of products for that plant was spare parts for machine Time back, they were wrapped in usual wrapping paper. Cost-sensitive indus-

. mattered not to the machinist who in-

they were wrapped in. So, out-dated

al plant and used.

ly there would be delays in the wrapped

n line. Analysis showed that they came

's "blared forth" some spicy item. Nat-

minutes to "get the message".

The production engineers had discussed it and decided that using papers with foreign print would end the delays - thus the order for the foreign newspapers.

The buyer felt that maybe this was an opportunity to put his creativity into use. Four of them, two industrial engineers, 1 production engineer and the buyer assigned an hour for the purpose. The buyer set forth the syste for withheld judging, positive thinking thruout, and quantity of responses. They functioned well. The real problem was"Delays For Reading". The proble was set "How might we end delays for reading?"

Some of the "thoughts" are here listed:

Use foreign language newspapers
Send papers through upside down
Send papers through with back pages exposed
Sprinkle with stain
Use flickering light
Use yellow light
Use lights too low to allow reading
- There were others - then came one so good that it ended the meeting
Use blind people.

An approach which was clearly so great, had been created by the period of properly organized creativity that there was no need to judge or improve other approaches. The Personell Dept people were over-joyed. They wanted work that the blind could do efficiently. The problem of production delays was ended. The buyer "threw away" the requisition. The buyer's use of his VA proceedures had paid off with several unexpected benefits.

...LDM...

84 - 21

SPECIAL PRESENTATION

Larry D. Miles, former Manager of Value Services at General Electric, is the founder of value analysis/engineering. He introduced it to the various businesses in General Electric as well as to areas outside of the Company, where it saved design engineers, manufacturing engineers, and purchasing agents untold millions of dollars of non-working costs. In 1950, General Electric presented him with the Charles A. Coffin award.

Mr. Miles, who retired in 1964, is being honored at this Conference for his significant contributions to productivity improvement. A display in the poster area depicts his achievements and the utilization of value techniques in General Electric's engineered producibility methodology. Mr. Miles will attend the Monday dinner session, at which time Conference attendees will have an opportunity to meet and talk with him.

Mr Fred Garry, GE - V.P. of Corporate Engineering & Manufacturing Introduced Mr Miles and Presented Above Plaque

CONFERENCE ON TECHNICAL MANAGEMENT

JUNE 3-6, 1984
DISNEY WORLD, FLORIDA

GENERAL ELECTRIC

At G.E.'s Conference June 3/6 - 1984 - At Disney World Fla - The Miles Value Analysis Story was told on 3 Panels - Set up in ballroom with panels from other G E Technical Divisions — Panel 1

THE MAN AND HIS IDEA

VALUE ANALYSIS

[illegible] implemented by the use of a specific set of techniques, a body of knowledge, and a group of learned skills. It is an organized creative approach which has as its purpose the efficient identification of unnecessary cost, i.e., cost which provides neither quality, nor use, nor [illegible] for customer features. [illegible] L.D. Miles

LARRY MILES' ASSUMPTIONS

1. MOST PRODUCTS INCLUDE UNNECESSARY COSTS
2. ALL CUSTOMERS WANT IS FUNCTION
3. FUNCTIONS ARE EITHER USE OR ESTEEM
4. COSTS CAN BE ASSIGNED TO FUNCTIONS
5. ANYTHING NEW OR NOVEL ACCOMPLISHES ITS FUNCTION THROUGH A REARRANGEMENT OF FAMILIAR THINGS

LAWRENCE D. MILES, former Manager of Value Services at General Electric Company, is the founder of value analysis/value engineering. He introduced it to the various departments of General Electric, the University of California, and a large number of professional societies such as ASTME, ASME, SAM, etc., where it saved design engineers, manufacturing engineers, and purchasing agents untold millions of dollars of non-working costs. In recognition of this accomplishment, General Electric presented Mr. Miles with its Charles A. Coffin award in 1950, given in memory of the Company's first president. In 1958, Mr. Miles received the Navy Distinguished Public Service Award, and in 1961 he was elected President of the Society of American Value Engineers. Mr. Miles retired from General Electric in 1964.

HOW IT BEGAN

HIS IDEA (1947)
LED TO HIS

CONCEPT AND METHOD
WHICH MOTIVATED A

CORPORATE MANAGEMENT
COMMITMENT (1948)

USE WORLD WAR II APPROACHES TO SOLVING MATERIAL AND PART SHORTAGES TO DEVELOP BETTER PRODUCT COST REDUCTION PRACTICES

USE "FUNCTION" BASED THINKING
NOT
"PART" BASED THINKING

HARRY WINNE, VP-ENGINEERING
"CALL IT VALUE ANALYSIS"

NICHOLAS DU CHEMIN, VP-MANUFACTURING
"TRAIN 1000 MEN A YEAR"

LAWRENCE D. MILES
FOUNDER OF VALUE ANALYSIS/ VALUE ENGINEERING

HISTORICAL HIGHLIGHTS

Panel 2

THE CASE OF THE LITTLE PIN

THE TINY PIN HELD IN LARRY MILES' HAND MADE NEWS IN THE EARLY DAYS OF VALUE ANALYSIS. THE PART WAS USED IN QUANTITY FOR TELECHRON CLOCK MOTORS. IN SPITE OF STRONG EVIDENCE SUPPORTING ITS COST OF ¼, ANALYSIS WORK SET ITS VALUE AT ONLY ¼. ANNUAL SAVINGS FOR TELECHRON WAS $112,000.

GE TRAINING OF US NAVY PERSONNEL IN VA TECHNIQUES HELPED SECURE A $20 MILLION SHIP PROPULSION TURBINE ORDER AND RESULTED IN THE NAVY AWARDING ITS DISTINGUISHED PUBLIC SERVICE AWARD TO LARRY

1964

LARRY MILES RETIRED

1960's

VA USED INCREASINGLY TO REDUCE COMPETITIVE SHOCK IN THE MARKETPLACE

1961

MILES' BOOK "TECHNIQUES OF VALUE ANALYSIS AND ENGINEERING" PUBLISHED

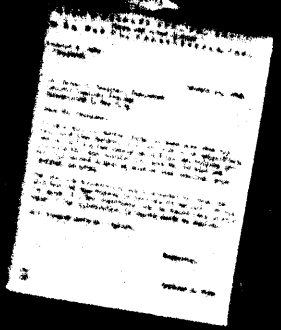
1959

MILES WORKED TO ESTABLISH THE SOCIETY OF AMERICAN VALUE ENGINEERS

LATE 1950's

GENERAL MANAGERS STARTED USING VA TO CURE LOST BUSINESS AND FALLING PROFITABILITY PROBLEMS CAUSED BY EXCESSIVE COSTS. EG.
— AIR BLAST BREAKER COST REDUCED 40%
— NEW VOLTAGE REGULATOR COST REDUCED 30%

GE's JET PUMP MOTOR ORDERS FROM FLINT AND WALLING INCREASED FROM $11,000 TO $313,000 IN ONE YEAR AFTER GE INSTRUCTED F&W PERSONNEL IN APPLYING VA TECHNIQUES TO THEIR PRODUCTS



1960's

EFFECTIVE GE SALES PEOPLE SAW IN VA A WAY TO BE OF GREATER BENEFIT TO CUSTOMERS AND TO EARN ADDITIONAL

INTERNATIONAL RECOGNITION OF MILES' WORK

Panel 3

• JAPAN

"MILES AWARDS" GIVEN BY SOCIETY OF JAPANESE VALUE ENGINEERS TO COMPANIES AND PERSONS FOR OUTSTANDING VA WORK

'Value Engineering' Said More Popular in Japan

Larry D. Miles, founder of "value engineering," said Friday that his method has been much more widely accepted in Japan than in the United States.

"The top management of Japanese companies has learned it (value engineering)," but he lamented, "in the United States this is not true."

Value engineering, in short, is a method by which manufacturers are forced to focus on the function of their product, and then to find creative approaches to restructuring production so as to lower costs and improve quality.

At a foreign press briefing in Tokyo, Miles begged his audience to pass on the good word to U.S. executives. He argued that many American managers are too shortsighted and close-minded to adopt the value engineering method.

On the other hand, he said that the Japanese have met with success because they have educated employees at all levels in value engineering, rather than leaving it to a small number of experts.

Akira Kodama of the Society of Japanese Value Engineers, which boasts almost 60 corporate members, pointed out that the method has been developed to a higher level in the United States, while it has enjoyed wider use in Japan.

Nevertheless, Miles did manage to cite a few cases in which American firms have "saved millions" by using his method. ...

The Japan Times Newspaper
Nov. 5, 1983

• CANADA

McGILL UNIVERSITY INCLUDES VALUE ENGINEERING IN ITS CURRICULUM AND HOLDS WORKSHOPS FOR INDUSTRY

• GERMANY

LARRY MILES AWARDED A MEDAL OF HONOR BY THE ASSOCIATION OF GERMAN ENGINEERS

"THANK YOU MR. MILES FOR THIS GREAT GIFT YOU HAVE GIVEN TO THE WORLD OF INDUSTRY"

• HIS BOOK HAS BEEN TRANSLATED INTO MANY LANGUAGES

VALUE ENGINEERING TODAY IN G.E.

AN EVOLUTIONARY PROCESS IN GE

MILES' VALUE ANALYSIS/ VALUE ENGINEERING
↓
VALUE CONTROL
↓
VALUE PLANNING
↓
VALUE MANAGEMENT

HAS LED TO →

CORPORATE ENGINEERING AND MANUFACTURING'S ENGINEERED PRODUCIBILITY METHODOLOGY

- VALUE ENGINEERING TECHNIQUES ARE PART OF THE METHODOLOGY
- EMPHASIS IS ON QUALITY WITH THE ACCOMPANYING COST BENEFITS

STEPS IN THE E-P PROCESS → TARGETED AT

PRODUCTIVITY IMPROVEMENT THROUGH

HIGHER QUALITY
HIGHER RELIABILITY
LOWER COST

THE MAN AND HIS IDEA

VALUE ANALYSIS

"A philosophy implemented by the use of a specific set of techniques, a body of knowledge, and a group of learned skills. It is an organized creative approach which has as its purpose the efficient identification of unnecessary cost, i.e., cost which provides neither quality, nor use, nor appearance, nor customer features."

L. D. MILES

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CORPORATE MANAGEMENT COMMITMENT (1948)

HARRY WINNE, VP-ENGINEERING
"CALL IT VALUE ANALYSIS"

NICHOLAS DU CHEMIN, VP-MANUFACTURING
"TRAIN 1000 MEN A YEAR"

Have typed message from Panels for easier reading -

LAWRENCE D. MILES
FOUNDER OF VALUE ANALYSIS/VALUE ENGINEERING

HISTORICAL HIGHLIGHTS

1948
Value Analysis Program established with Larry as manager--Value Services.

1948-52
$10 Million benefits reported

1950
GE's Charles A. Coffin Award presented to Larry "in recognition of his outstanding accomplishment through the establishment, organization and development of a value analysis program which has resulted in substantial cost reductions."

1952
First Value Analysis Seminar, Schenectady, NY.

1952
First business department Value Analysis component established at the locomotive and car equipment department, Erie, PA.

1953
On-site seminars started.

1956
2500th Seminar trainee graduated.

1950's
Creative GE sales people saw in Value Analysis a way to be of additional benefit to customers and thereby earn additional orders, two examples.

GE's jet pump motor orders from Flint and Walling increased from $11,000 to $313,000 in one year after GE instructed F&W personnel in applying VA techniques to their products.

LATE 1950's
General managers started using VA to cure lost business and falling profitability problems caused by excessive costs, EG.
--air blast breaker cost reduced 40%
--new voltage regulator cost reduced 30%.

1959
Miles worked to establish the Society of American Value Engineers.

1961
Miles' book "Techniques of Value Analysis and Engineering" published.

1960's
VA used increasingly to reduce competitive shock in the marketplace.

1964
Larry Miles retired.

NAVY PRESENTATION

Value analysis was introduced to the Navy in 1953 when Larry Miles was invited to make a presentation to the Bureau of Ships. He is shown above with Rear Admiral Wilson D. Leggett, Chief of the Bureau. Result of the meeting was the establishment of the Navy's Value Engineering.

THE CASE OF THE LITTLE PIN

The tiny pin held in Larry Miles hand made news in the early days of Value Analysis. The part was used in quantity for Telechron Clock Motors. In spite of strong evidence supporting its cost of 3 3/4¢--analysis work set its value at only 1¢--annual savings for Telechron was $112,000.

G.E. training of U. S. Navy Personnel in VA Techniques helped secure a $20 Million Ship Propulsion Turbine order and resulted in the Navy awarding its DISTINGUISHED PUBLIC SERVICE AWARD to Larry.

Letter from Flint and Walling on next page.

3 E

COPY OF Letter --

Flint and Walling Mfg. Co. Inc.

Pumps and Water Systems

90 N. Oak St., Kendalville, Ind.

Richard C. Cole

President

Jan. 19, 1959

Mr. Ralph J. Cordiner, Pres.

General Electric Co.

Schenectady 5, N.Y.

Dear Mr. Cordiner:

It is a far better thing you have done than has ever been done before. I do not wish to be enigmatical, but to tell you how keenly we at Flint and Walling appreciate the fine seminar that your Mr. Ed Bush and Mr. Paul Binder helped us hold on your sterling Value Analysis program.

The sterling presentation was a stimulus to everyone that had the opportunity to participate therein- it was the spark of a new department that is functioning gratifyingly- our appreciation is beyond words to express .

With kindest personal regards,

Sincerely,

Richard C. Cole

RCC/AHF

INTERNATIONAL RECOGNITION OF MILES' WORK

*JAPAN
"Miles Awards" given by Society of Japanese Value Engineers to companies and persons for outstanding VA work

*CANADA
McGill University includes Value Engineering in its curriculum and holds workshops for industry.

*GERMANY
Larry Miles awarded a Medal of Honor by the Association of German Engineers.

"Thank you Mr. Miles for this great gift you have given to the world of industry".

* HIS BOOK HAS BEEN TRANSLATED INTO MANY LANGUAGES

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The Japan Times Newspaper
Nov. 5, 1983

L. D. MILES
SEDGEFIELD R. 5, B. 840
EASTON, MD. 21601

Written June 1983
By L.D.Miles

VA PRINCIPLES ARE "ACTION TECHNIQUES"

A Materials Director of a medium sized corporation asked me "What is 'Value Analysis' anyhow, I hear it just often enough that it sounds like a buzz-word"? I replied that I would first tell him what it was not, then star him up a $100,000 learning curve that might make his company plenty.He liste It went about like the following.

Value Analysis is by no means a search for new materials and processes, Materials departments and laboratories and engineering departments and manufacturing organizations are constantly doing that.

Nor is it a substitute for the effective cost reduction groups which dai are increasing value.

Value is proper quality, with costs as low as, or lower than, the best competitor. Value Analysis is a well-informed creative study of every item of cost in every part or material - in view of other possible materials,newe processes,abilities of specialized suppliers and possibilities for engineeri re-evaluation; focusing Engineering, Manufacturing and Purchasing on one objective -- equivalent performance at lower cost.

Value Analysis must bring new information into the project from new areas within the company, and from specialist suppliers outside -- new possibilit and new value opportunities each with its definite cost,for proper evaluatio It will refer this new information into its proper normal channel -- the en ineer,the manufacturing man, the marketing man or the buyer -- for decisio

Value Analysis relates cost to the function or service or operation purchased by that cost. Specialists in the company, and to a large degree outside, are assigned specific functional areas. Their engineering is put to work on our needs instead of our competitor's. Their suggestions are provide with a dollar sign attatched, for our evaluation.

The function of Value Analysis is to make certain that, viewing every usable idea,process,product,material and supplier, each part individually and each group of parts when considered as a unit, represent value -- ie the proper function wanted by the customer, at costs as low as, or lower thar the best competitor.

Value, that is, making sure of the proper function and the proper cost, is analyzed by working with the people of engineering, marketing,manufacturir laboratories and vendors. The buyer makes an intensive study endeavoring to

lower materials and parts cost by substituting,eliminating, combining, simplifying or otherwise altering parts or materials through application of knowledge of materials and prices, the use of vendors specialized skills, new ideas and purchasing negotiation. The function, the construction, the manufacturing methods, the sources of supply and the purchasing arrangements for each part and each material, are reviewed.

Each item of cost is severely questioned.

1. What does it cost per year?

2. What does it do? -- What is its function?

3. What else would do the job, and what would that cost?

To promote good thinking, function is simply defined as...

Something that makes the product work better...

Or sell better.

Surprisingly, Ten "Tests For Value" originally put together for buying people, often still produce thinking which is profit productive.

1. Does its use contribute value? (useful function or lower cost)

2. Is its cost proportional to its usefulness?

3. Does it need all of its features?

4. Is there anything better for the intended use?

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

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

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

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

9. Will another dependable supplier provide it for less?

10. Is anyone buying it for less?

Use of VA is Now Becoming World-wide

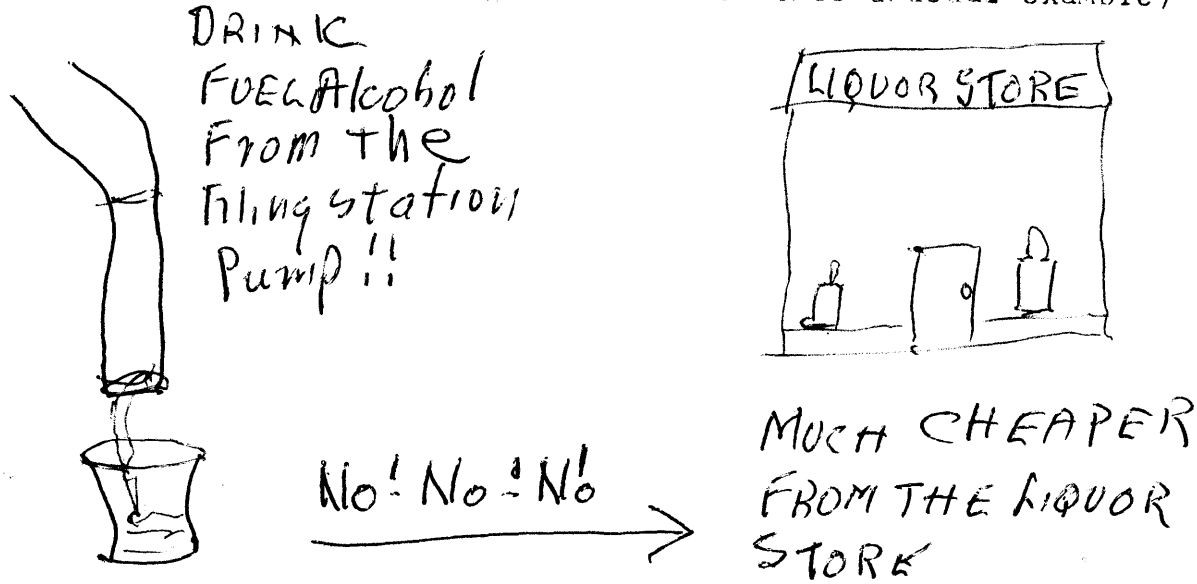
An example from "south of many borders" will be interesting. An engineer chemist working in a laboratory in Brazil saw an article describing Value Analysis. Now an industrial leader of Brazil, Herbert Stukart director of the great Klabin do Parana company, tells it this way. "I saw an article about Value Analysis. I became so interested that I went to New York to learn the method. I was shown Miles's articles and interviews in the "Wall Street Journal","Los Angeles Herald and Examiner","Management Magazine","Readers Digest' and a number of specialized magazines in Engineering,Production, Purchasing,(I'll describe my first use of it on my return to Brazil."

"My laboratory in Rio de Janeiro imported formulas and technicological packages from Europe. One was an extremely expensive chemical, the name of which I cannot now recall, so I asked 'What is its function?'" Mr Stukart

learned that it was used as an adder to ethyl alcohol which was intended to be used as automobile fuel, so that the fuel alcohol would have a foul taste and not be used for human beverage. Already 1/3 of the cars use alcohol

He first checked "Tests for Value # 1", Does its use contribute value? He found that the answer was "No",ended the use of it and eliminated the expense. Getting the full facts showed that in Brazil there was no tax structu levied on beverage alcohol. In fact getting the alcohol in the form of "cachaca", a typical Brazillian alcoholic drink was considerably cheaper than getting it from fuel alcohol,so, adding the foul taste added no function.

(some kind of an art cartoon calling attention to this unusual example)



Director Stukart is now improving productivity thruout Brazil by stronaly promoting Value Analysis.

...ldm...

L. D. MILES
SEDGEFIELD R. 5, B. 840
EASTON, MD. 21601

Written July 1983
By L.D.Miles

VALUE ANALYSIS JOB PLAN FOR BUYERS Part 1 of 2

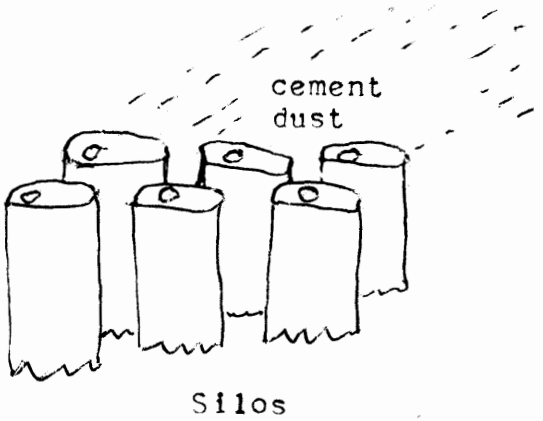
"Just what is the VALUE ANALYSIS JOB PLAN? Is it usable by buyers? How do we use it?"

Like any good plan, it contains the actions, which are listed as "steps" to be taken, one-at-a-time. This unusually good plan secures unusually good results in an orderly achievable way. It is for buyers. It has six seperate steps, ie six differing kinds of thinking,each to be done thoroughly and in progression as listed.

1. SENSE-OF-DIRECTION STEP

The buyer, or procurement leader develops in all persons who will be involved,a definite, and stated, feeling of purpose. It usually takes the form of answering the question, "Exactly What are We Trying To Do"? It often changes the whole course of work on a procurement.

Procurement and engineering people were ready to place a $40,000 order for dust collector equipment on a group of silos in a cement plant. When asked to name "Exactly what are we trying to do"? They responded,"eff-



Silos

iciently buy and have installed, a dust collector system as we were told to d by the Board of Directors." With further guidance, they changed it to "Help the Board of Directors operate a competitive, profitable business".

The next step can now be useful and will be illustrated.

2. INFORMATION STEP

a. Secure all pertinent facts -- many more facts than you then believe you need. Secure actual samples of parts and assemblies where practicable costs, quantities,vendors,drawings,specifications,planning cards manufacturing methods information and expected future.

b. Learn the basic engineering. With the engineer, ask questions,listen, develop with him a thorough understanding of the product.

c. Learn the basic manufacturing. Observe manufacturing as they use the material. Ask questions, listen, study.

Example continued -- some questions and answers developed. Was there always dust? A No. When was there dust? A When the silos were somewhat over-filled. Any other time? A Yes. A 30# pressure air line is used at the bottom of the silos to facilitate downward flow. Sometimes the 30# line is stopped up. The is also a 150# line available - basically to blow dust off of the cement truck When that is used instead of the 30 # one there is dust.

the creative solutions in the next step. ie;How might we reduce the scrap steel in making that part, from 20% to 5%? How might we reduce the non-working silver in that electrical contact from 75% to 25%?

Now the right problems are "set".Creativity will be effective.

Example continued -- One member of the buying group said that considering what we now know about the dust problem $10,000 would be too much to expect to pay to correct it. The accounting member of the team said,"We have a plan that we will not make capitol expenditures unless they will be returned in two years. With only $2000. savings, if there were not other factors involved, we would spend a maximum of $4,000, not $40,000 to correct it." The group decided that solutions should be found costing not more than $5000 total

Sometimes a problem is essentially "solved" by actions in some of the first steps. This example was made easy by actions in steps 1 & 2. Changing to the right problem, in step 1, and gaining information and knowledge in step 2. Little organized mental effort was needed to now establish a good solution which, it developed could be accomplished for $4,000 instead of the intended $40,000. It included:

1. Improve maintenance of the 30 lb. line and run it overhead where it crosses the road in order to eliminate the low spot where crud collected.

2. Move the 150 lb. pressure air hose which was to be used for cleaning trucks, so that in no case would it reach to the silos.

3. Some useful steps were selected to minimize or stop the over-filling of silos.

4. Some ideas concerning the location, number and type of air nozzles,bot around and inside the silo base (to induce cement flow) were discussed for further investigation.

5. Each silo had a ventilation opening at the top. It was from these oper ings that cement dust escaped. It was determined that a simple duct system connecting all of these openings could be installed for about $2,000. Dust from one silo would then drop into the quiet air of another. It was also dete mined that although sometimes the cement in different silos had slightly diff erent formulation, this minuscule quantity would have no effect.

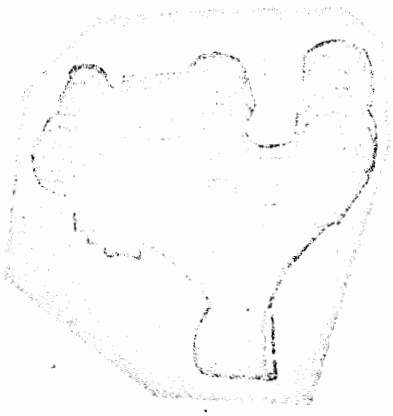
A different example, which required professional grade work in the last three steps of the job plan, will be used to illustrate those steps.

L. D. MILES
SEDGEFIELD R. D. B. 840
EASTON, MD. 21601

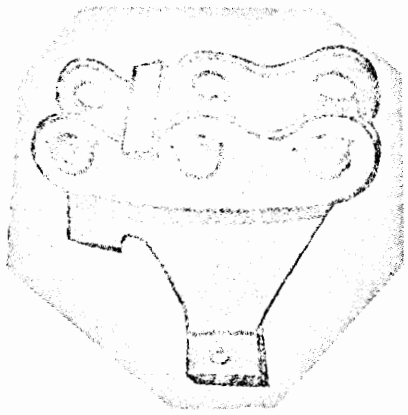
Written July 1983
By L.D.Miles

VALUE ANALYSIS JOB PLAN FOR BUYERS Part 2 of 2

The buyer startled the plant manager when he bought interlock frames for $1.80. They had been costing $7.80. 5000 per year were used. Tooling was $1(



Interlock Frame
Machined Casting
$7.80



Interlock Frame
Fabricated Steel
$1.80

As soon as the first flush of joy at the added $30,000 per yr. earnings - after first year tooling cost - moderated, there came the usual "back-looking' If it could be done, why didnt we do it before -- about 5 years before?

During this normal stage, everyone who had had anything to do with the product felt "edgey". With so many trying so hard to "point a finger", each one felt that some "blame" might light on him.

Two weeks later the manager called a meeting of people involved with the product. He opened with a statement about like, "Lets develop information so that we can, first - understand what produced this extra earnin second determine why it didnt happen several years earlier, and third - what other situations still exist in our costs which, with what we have now learne can also now be turned into earnings".

The buyer had been using his VA job plan for 6 months. Steps 4,5 & 6 will now b described, and illustrated by some incidents from the above example. During Step 3, the buyer had courageously and brilliantly studied the product and hac assessed the opportunities. He had "Set his Problem" at - How might I procure high quality interlock frames at $1.00 instead of $7.80? Step 4 of the Job Plan now follows.

4. CREATIVITY STEP

a. Generate every imaginable solution to the problem.

b. Include others who may help. Follow the basics of idea creation, by periods of absolutely positive thinking with no negative thoughts and all judging deferred. Jot down everything suggested.

c. Systematically explore various materials,machine processes, re-arrange ment of parts, specializing vendors, etc.

d. Include actions that will cause even freer use of the imagination.

Example continued. There had been some problems selecting knowledgeable people who would, participate in positive, non-judging creativity. The manufacturing specialist was so full of previous bad-experience that he actually chilled the discussion so much that positive creation could not take place. The buyer placed an ash tray in the center of the table and told all present that each time one of them brought forth - during the non-judging - period, a negative, he must put a quarter in. This helped tremendously. A few quarters came in, always with a smile, and the thinking became much more positive. The manufacturing specialist was the exception. Soon he got up and left saying, "This has already cost me 75¢, and I cant open my mouth , I dont want any part of it."

Dozens of approaches were listed. Make it of plastic. wire-form, shell-molding, thin metal, built-up brass, bronze, copper, steel. Make as a zinc castir Eliminate it - perform its functions in surrounding parts etc.

Next came job plan step 5.

5. THE ANALYSIS AND JUDGEMENT STEP

a. Relaxedly / view the creative list, not with the idea of striking out thos which wont work, but the exact opposite. View each as an idea which can

be made to bring great benefit, or as a stepping stone to an unlisted idea which will bring great benefit.

b. Develop all ideas, with emphasis placed in proportion to their benefit and probabibility of accomplishment.

c. Investigate those ideas with an "obvious" reason why they"wont work". List the good points and the bad points. Creatively attack the "bad point Some of the most profitable solutions have come by this path.

Example continued. Judging is best done by the responsible personel with the aid of specialists who contribute knowledge to him - usually one-at-a-tir The buyer worked with the engineer, the marketing person, the manufacturing manager, the Quality Control man and the finance man. The buyer and engineer selected the fabricated steel alternative as worth a t Manufacturing said "no-way". "The frame takes a beating by hammering open ar closed thousands of times. Thin metal would'nt take it".

Finally step 6 of the job plan is included.

6. ACTION PLANNING STEP

a. Break down each buying job into functional areas; ie a fastening job, an electrical contact job, a support job, a dust proctection job, etc.

b. Select top specialists to consult on each.

c. Select from one to three of the best suppliers known, for each functional area of the product.

d. Periodically support the work of these specialists by creative discussions of what they have done, and what's stopping them from doing much better.

e. Stick with each promising suggestion. Thrash it out and reach definit beneficial solutions.

Example concluded.

The vendor said that he could make it and that it would handle the motion. Engineering paid a modest amount for three hand-made samples. Two were put on accelerated test, as were two of the present ones. The fabricated parts/lasted longer. Tooling was ordered, samples were tested and production authorized.

The manager learned that the earnings were produced, not by the advent o new materials or methods, but by the use of a new thinking method which combined knowledge and creativity, set creative, tho realistic tasks, and overcame enough negatives to accomplish them. The $1.00 goal which the buyer se helped generate enough support and overcome enough negatives to reduce the c from $7.80 to $1.80.

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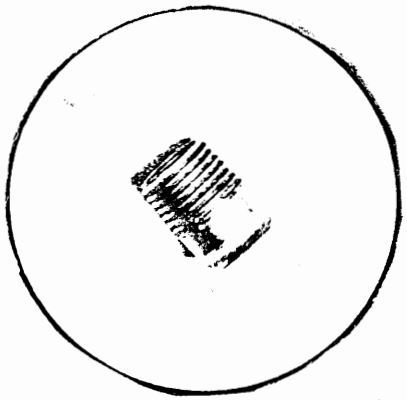
Written Aug.1983
By L.D.Miles

HOW MUCH VA PRINCIPLES KNOWLEDGE - FOR BUYERS - IS ENOUGH

My phone rang. The voice said "I'm now Materials Manager. Our company make buys and distributes components for electrical control and some complete controls. Already, one buyer who says he knows some about Value Analysis principles, but very little, brought in a meaningful example - and a request. I'll send you the example, but right now I want to ask you about his request. He wants to go to one of the 40-hour Value Analysis Methods training courses and get the 'Full Treatment'. Actually, this sets forth a broader question. I have 6 buyers. Can you provide something I can use to find out how much each of my buyers knows about VA Principles?"

The example he sent in was 10,000 weld fittings per year which cost 45¢ each. They were made by machine work adapting a fitting which was bought as a standard. The buyer reasoned that all of the machining cost brought no function, if he could buy the part "ready to use".



Stainless Steel Weld fitting

from 45¢ to 12¢

He got prints of the finished part required and developed a supplier who woul make the stainless steel parts by automatic screw-machine from thick walled tubing. The cost became 12¢ each. Total cost was reduced from $4500. per yea to $1200 for $3000. earnings increase.

To help with his program to develop more VA principles knowledge in his buyers, a 10-question test was provided to him. It achieves a two-fold use. Its short,simple questions receive short, simple but very meaningful answers from those who really understand VA. Secondly, it serves as a teaching tool to guide others into vital areas of technique.

For the help of others, the test is here included. It is vastly more beneficial if each person interested FIRST jell up his answer, BEFORE reading the answers.

SIMPLE - BRIEF - BASIC EXAMINATION OF VALUE ANALYSIS PRINCIPLES

1. What is Value Analysis trying to do?

2. How is it trying to do it?

3. What is it's approach?

4. What constitutes VALUE in a product or service?

5. Who causes good value, or poor value, in a product or service?

6. How do the approaches reduce cost without lowering quality?

7. What four separate and distinct types of thinking are included in the Value Analysis Disciplined Thinking System?

8. What is USE function? Give three examples.

9. What is AESTHETIC function. Give three examples.

10. What is BASIC function? Give three examples.

ANSWERS TO THE 10 QUESTION EXAMINATION.

1. End all costs which do not contribute to USE or AESTHETIC functions which the customer wants.

2. By a depth study of all functions and the creative development of alternatives which would produce them.

3. To study functions. Identify them. Classify them. Separate them. Group them. Create specificic problems, then solve them.

4. Good quality, with costs as low as, or a little lower than competition.

5. Anyone. Good quality is caused by getting a little better answers than does competition.

6. By concentrating on the functions which the customer wants, getting them for competitive costs. and eliminating costs which are not essential to customer function.

7. Information Development, Analysis, Creative, and Judgement.

8. USE function is the utilitarian function the customer gets from a product or service. Electric range - cooks food. Broom - cleans floor. Bottle - contains liquid.

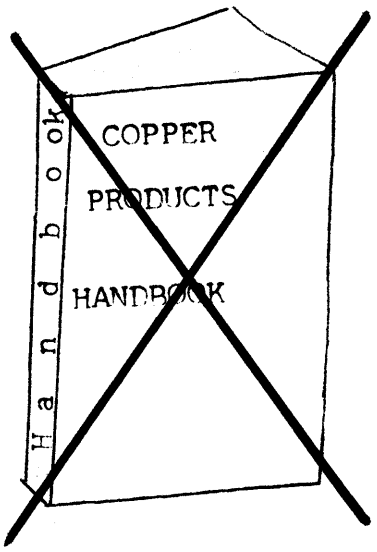
9. Aesthetic Function is the function which pleases the customer, but does nothing utilitarian for him. Jewelry - conforming to his custom and wanted appearance. Toaster - External shape and surface treatment pleasing to customer. Furniture - The attractive graining of wood.

10. Basic function is the function for which the customer buys the product or service. Pencil - make marks. Refrigerator - preserve food. Automobile transport people. Jewelry - please customer

Knowing VA proceedures causes the buyer to reach beyond the requisition and, in so doing, make additional,usually unexpected contributions. Good training will get a good buyer from two to ten times its cost many times over each year.

For another example, following training, the copper buyer received a requisition to buy 60 pieces of copper buss ½" x 2" x 300' long. He learned that the pieces were to be fabricated into conductors, each 1500' long for

use in hydro-power generators. That meant that 5 pieces had to be brazed together for each conductor. Although the handbook listed "500' as the longest possible length available", he, while considering the proper yield for a good buying job, set his goal at buying them in 1500' lengths ready to use.



With the determination he had developed and a probable yield in mind, he visited the factory of the copper supplier with handbook in hand. He told them of his need for 1500' lengths, and asked to see the buss-bar fabrication operation. There he saw the finished material coming from a continuous operation with a "flying" cutter periodically moving along with it and cutting it off. He made known to the operations people, his need for 1500' lengths.

The following week he received shipment of a 1500' length, neatly coiled on a skid and extremely convenient to handle. He had saved for his employer all of the extra cost of the handling and the brazing, and -- the supplier found it so practical that he lowered the base price on the copper.

...ldm...

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Written Sept. 1983
By L.D.Miles

INITIATIVE - KNOWLEDGE - CONFIDENCE - SKILL

In a VA seminar an invited vendor asked,"Why do you waste your money fou ways on that 9 pound steel permanent mold casting"?

The buyer on the team answered, "That's pretty big talk, why dont you explain what you're talking about"? It was a high volume appliance item,of 20,000 per week.

The answer was. That is a permanent mold casting, still I see un-cored holes and thick sections that have to be machined off. The way you pay fou times for nothing is this:

1. Since the molds are not properly made and the castings are priced by weight, you are paying for a lot of metal that you dont use.

2. Look in your machine shop. You're spending a lot of money to machine out the metal that shouldnt be there.

3. You pay the transportation in, by the pound, so you're paying for som thing you dont use.

4. You ship the scrap metal back to the foundry, so you are paying freig again on something that does you no good.

The buyer was activated. He asked the present supplier to do something about it. It is often easier for a present supplier to "talk down" the pos ible benefits of a change, if he can, than to go into the uncertainties of change. He said it would not be good practice to make the walls thinner because of the dangers of blemishes and cracks, but that if they were re-making the tools they would core one of the holes. So nothing was done.

The new vendor submitted a favorable proposal. He was given an advance tooling order for $2000. to build some tooling, make some tests and prove out his contentions.

A month went by with no word from him. Then a second month passed. During the third month the buyer got into touch with him. He said "It was no good. The engineers and the factory were 'sour' on it. He could get no more action. It was dead in his factory. He would initiate the action to refund the $2000 if it was requested".

Meanwhile the buyer had been studying permanent mold castings. He didnt "die" easily. He had visited a buyer in another company which used lots of permanent mold castings. He saw what was being done, and saw that it was goo He became acquainted with a supplier who was doing a superior job on simila work in the other factory. He secured a good proposal from him, but, becaus of his previous experience wanted to be double sure he was right in placing an order. He arranged to go to the vendors foundry.

It happened that the buyer's company was having an "Economizing Kick" ri then. To quote the buyer, "We were economizing; turning off the lights when we left, were'nt using any more paper than we had to, and all trips unless absolutely necessary were knocked out, so, when the boss heard about this

trip he very seriously questioned the $300 expenditure for it. My own immediate boss was very farsighted in the matter and went to the top manager. He told him,'this thing looks promising to me, I think we can make some real improvement and I think we ought to do it'. The top manager was negatively non-commital. My boss / told the top manager that arrangements were being made, and that unless he was absolutely told dont go, the foundry inspection would be made. I went".

Orders were placed on the supplier. He was skilled in his line. To again quote the buyer, "They not only cored out one whole area, which was what we wanted,they cored out an adjacent bushing hole. They cut down the thickness of the web by half and left pads for the mounting bolts. They saved 3 pounds of material."

The buyers initiative - with the support of his boss, his habit of learni his practicising of the VA principle "Dont Be Stopped",had brought the compa many benefits in the four areas of wasted money pointed out at the seminar.

1. Metal paid for and not used. 3 pounds less to buy at 8d/lb, 24d reductic each, $240,000 each year, additional earnings.
2. Unneeded machining away of metal eliminated. Amount substantial but was not determined.

3. Incoming transportation on 3# per casting,20,000 castings/week ended.

4. Large costs ended by reducing amount of return scrap shipment.

We learn from this one example that this buyer is a good one to have on any important job. He says that he has a motto which he thinks of often. We quote him, "No matter how expert the person is that you get your advice from; dont let him buffalo you, because at the same time there's probably someone else who's just itching to get his hands on that job, who can do it and will do it if you just give him an opportunity to work on it".

...LDM...

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Written November 1983
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A GLIMPSE OF HOW OTHERS USE V A

After 10 days with the leaders in the industry of Japan, who are our customers-suppliers-competitors in industrial USA I feel motivated to report some of their important practices, especially relating to our special methodology of Value Analysis.

As told to me by Japanese management,I will report.

After the war Japanese quality was inadaquate to compete worldwide. In 1951 McArthur's Japan restoration forces invited a United States leader in Qualit control, Mr Deming to come to Japan. He made many instructional trips,teaching statistical quality control and other vital quality control approaches. His work and their "followship" were so effective that Japanese quality, in a few years equaled and often exceeded that of their competitors. To motivate and increase good "quality" practices they created the "Deming prize", which, as I recall is awarded annually,and which, recipients are ver proud to receive.

In the late 50's they found another problem. Their costs were often too high to allow them to absorb all of the transportation expenses on raw material and product, and the necessary selling expenses. Meanwhile they had come into contact with the Value Analysis approach which was growing in the USA with methodology which maintained or developed the needed high quality, and secured competitive costs. In the late 50's they sent business people and professionals to check out the value of VA. They found it to be so effective that they started sending study groups to make industry visits and

and to attend the meetings of the Society of American Value Engineers, after it was organized. They bought rights and translated Miles' Book, in 19 and followed it with others. The 1960's and 70's were filled with learning improving and using the best methods they could find, including Value Analysis methods, which they found to be quite superior.

To help learn, improve and use the VA methods the Society of Japanese Value Engineers was formed by Japanese Companies. About 400 of the major companies are members. Attendance at their conferences is about 800 persons

To motivate greater and greater use of the VA methodology they have developed another award which they call the "Miles Award". It will be awarded annually to companies which show the most benefit from the use of the VA methodology. This year it was awarded to 7 Divisions of companies, 1 to Matsushita Electronic (Panasonic), 3 to Hitachi and 3 to Fugita (construction) Co. When the divisions of a company have accumulated enough awards, an overall company award will be made.

From the records of two winning divisions, I will extract some items:

* "Intrinsic understanding of VA methods have been learned thruout the plan so that the functions secured for each cost expended are analyzed, viewing the product market, the product, the process and the materials".
  "From these factors, explicit objectives are developed by management planning. Work to achieve these objectives is operated and controlled by the Division manager's office to which all VA activities have been directly linked."
  "There is an effective system of VA actions which include plans, policies training, evaluations, information and control. Using VA in marketing to identify customer values has contributed greatly to results from the bus

* "This Division consistently applys VA to civil engineering and other aspects of our construction business. A 'Short-time VA job-plan'program has been widely adopted thruout all worksites and offices. This has contributed substantially to much increased profit from construction work. VA is the central means for securing optimum management and work-team effectiveness. Our VA practice is not limited to our work-sites,but is effectively carried out among client personell in the matters of client design,quotation,procurement,operational control and other business. The VA promotion committee took the central role in 1970. Now a full-fledged VA promotion department exists,reporting to the General Manager and functioning to comprehensively implement the companies VA policies to effectively produce VA results from daily work activities."
"Information about successful VA cases is systematically gathered and used in similar construction work. All decision-making personell are VA trained.These efforts altogether have made a remarkable difference in the realized earnings."

Conclusion Materials and Procurement people in the United States who understand the basic approaches of the Value Methodology have often experienced large dollar benefits from its use. These up-to-the-minute examples of how the methods are being used,not only in procurement, but in company-wide operations may help them to help other departments of their companys more.

...ldm...

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Written January 1984
By L. D. Miles

WHAT IS TIMELY?

WHAT IS YOUR MANAGEMENT TRYING TO DO -- RIGHT NOW?

As a procurement person you hold one of the key spots on the team. Do you "Feel" that? You're the"End"who can score at any minute. You're not the quarterback who calls the plays, but you're a "Ball-carrier" who can "Pull-off" surprising successes and make the quarterback look mighty good -- IF you know what he wants to do, and when. Knowing what he wants, and when, is very important. You cant do it alone.

First, lets make sure you, as buying people, feel as important as you are. Each day, as you come to work "can be a big day". If you "feel" that way, you will "do" that way. Be sure you know and feel that Purchasing is the big responsibility area and opportunity area today. More than half, often 55 to 60% of the cash spent by industries and businesses today, is contracted for and spent by procurement people. Purchasing people,today are getting the charter, and the instructions to carry the ball - to win the game.

You buyers, with your VA methods can make an unexpected cash or quality contribution on almost anything you buy. Know what management is much interested in - at all times. They will give special help, and you will need the help, to make large unexpected contributions there. And - by this means your "quarterback" learns what you can do. He will oftener call on you and support you. An example will illustrate.

A company had a fine business making and selling electrical street light controlers,largely to cities and towns. They were the systems that provide the customary green-yellow-red control at intersections. Most were

sold by competitive bids. The products of three companys were considered by most buyers to be of high quality. One competitor apparently had done some work to lower its costs and by bidding lower than historically,got some big important contracts. The manager of the company losing the busines figuratively said"Here,here this has got to stop" and sent word thruout the company to get out enough cost so that the business would thrive again.

The buyer looked at what he bought for the product. One item was 100 feet of steel bar 2½ inches dia./He followed the winning VA steps.

1. What was the function of the item?
2. a What was the cost/item ready to assemble into the product of the

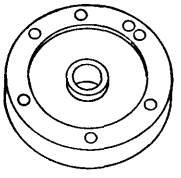
   b Establish the function-cost relationship.

3. By creativity provide good alternatives to the question, "how might we provide that function for much lower,in this -- the buyer used ½ the present cost"?

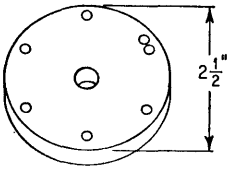
Knowledge gathering showed that the material was cut into discs about ¼" thick. Many holes were drilled in it, and a portion of the material was machined out so that it in-effect became a rim with a hub. In use it separated and mounted two 6" dia x 1/8" thick aluminium discs which contain slots into which inserts were slid to control the light timing.The discs were rivited to the center support.

The buyers creativity brought forth several alternatives but the one judged best was to buy a commodity available on the market - aluminium slugs. They are punched out of sheet material by aluminium companies and sold by the thousands or millions to companies who make impact extruded containers of various kinds and sizes - toothpaste tubes etc. They were round and various thicknesses and various sizes. One standard item was the right size,2½" dia. x ¼" thick.

The quantity was 2000/year. Cost of the present machined discs, ready to assemble was $2.54 each. Cost of the usable aluminium discs,as bought, was 8¢, however since it was stamped from sheet metal it was a little "cupped", not totally "flat". A flattening operation cost 2¢.The needed holes were put thru it for another 16¢ and it was ready to use,totally interchangeably. Total cost was 26¢ instead of $2.54 each.



ORIGINAL $2.54



AS CHANGED BY BUYER

INITIATIVE 26¢

Identical USE function - with no AESTHETIC function involved resulted at 1/10 the cost - normally considered by sensible business people to be impossible - $4000/year lower costs.

This experience - knowing what management at the moment was especially interested in achieving - and assigning some time to further that project at that time - brought many plusses to the purchasing office.

The buyer was called into the next meeting the manager had with his Marketing, Engineering and Manufacturing people on the product. Understandably Engineering and Manufacturing people were sensitive to the thought that they should have used the available aluminium centers before,but the manager readily accepted the reality that they could not know all of the vendors specialty materials - happy to have them now to help get this product back into the viable profitable column. He encouraged them to utilize the buyer more and to give prompt attention to the opportunities he provides The buyer,with that support,made 6 more importantant product improvements.

...ldm...

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Written April 1984
By L.D.Miles

WHICH VENDOR IN YOUR WAITING-ROOM CAN BRING UNEXPECTED EARNINGS?

An absolutely new - to your company - source of revenue is the vendor whose company has a capability your company needs, but he doesnt know you need it and your company doesnt know he has it. Who can be the catalyst? You, the buyer can be.

In every field - every seed planted doesnt grow. Every egg laid doesnt hatch. Every cloud doesnt bring a rain-shower. But some do,and some are 100% better than none. Some of these vendors sitting in your waiting-room are a potential goldmine for your company. How will you recognize them? How will you sort them out?

Knowledge is the first step. The buyers knowledge of the functions needed by his company, in specific item by item terms. He usually wont find it written out. It wont be on any "buy-list". It won't be in any specification. It is the source of earnings that is "between the cracks", usually over-look The buyer is usually the only one who can have a continuous direct charter to find it. It often comes as a surprise - and a delight,like dropping a hole-in-one on the golf course. Often five verbal "searches" will yield one winner.

But - it becomes a winner only after the buyer communicates his way thru-out his organization. Often, the bigger the benefit, the more promotion by the buyer,is required.

An example is the salesman of a machine-tool specialty company. He came about each two months. He made a courtesy call on the buyer, then was always

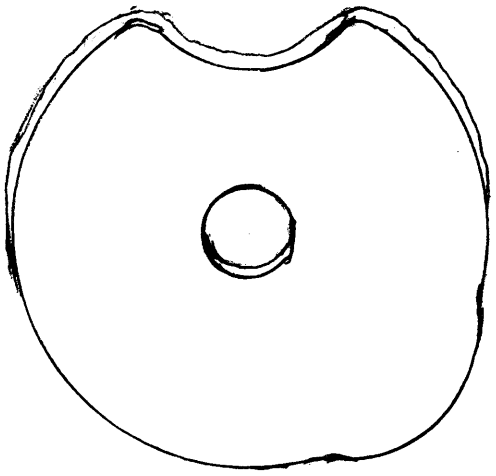
taken to the Tooling Specialist in the factory. This time the buyer surprized him by saying,"Show me some of your Special Purpose materials we are not using". Among several shown was a material called Kirksite. About this material the vendor said,"It has very unusual properties. Like lead, it can be melted at relatively low temperatures and poured into any desired places, but un-like lead, after it cools it is quite hard - not as hard as steel, but often hard enough to do jobs in tool and die work for which steel is usually used, and the convenience - in being able to pour it instead of machine it to shape saves time and cost".

This time the buyer went with him to the tooling specialist.Among other items he asked the specialist if we might have application for this material "Kirksite", and described its properties. The specialist said,"Maybe so.

BRASS

CONTROLLER

CAM



We make one little brass cam of 1/16in. thick material,about 3in. in diamete basically round, but with several variations on the outer edge. As the cam turns, a roller on this outer edge acts to turn electrical switches off and on. We use only 100 each year and we hand cut,file and grind them to shape. Its a 'Stinker' of a job, but it would cost a lot of money to make tooling to stamp them out, and the quantity we need is so low". The vendor said he would provide enough sample Kirksite to try it out. You say, "Simple" - yes,but it isnt simple. It's a new approach. Even to try it a lot of responsible people must become informed.

The Tooling specialist went to the manager of tooling,showed the approach to him and asked for a $50. Shop-order to try it out. The manager turned down the request. He said that it is obvious the material was too soft, it would not punch out the brass cams without destroying itself.

Meanwhile the tooling specialist studied more about the material and became more interested to try it out. He decided to go "Over the head" of his boss and give it another try. He went to the manager of manufacturing of the entire factory. He showed him the material and told him he hoped it would be hard enough to punch out the brass cams and that they would be very uniform and very low cost,and that he needed a $50.00 Shop-order to try it out. The manager complimented him for his initiative and told him to keep up his creative work, but said,"Unfortunately, in this case, it would not work, it would be too soft".

By now the tooling specialist was becoming emotionally involved. He felt "The Heck With It". He charged the work to a Shop-order he had for another project, and tried it out. They took a suitable blank mold form,put a well made cam in it, and poured the Kirksite around it. They took out the cam, transferred the molded part to a proper fixture for the punch-press,took some brass sheet material, and tried it. He punched out two,then a dozen. It worked! They were the smoothest cams they had had.

Then the excited specialist thought "Good Gosh What Do I Do Now?" He had violated the instructions of two levels of bosses! He decided to do what in his words was "Get the worst over first",so he went to the manager of manufacturing,told him and showed him samples. The response was very positive. The manager went right down to see some samples made, and was so surprised and moved by it that he set up a schedule and invited engineering and manufacturing people to come and see demonstrations and learn.

Of course he had no more trouble about the $50. he had spent. An interesting joke did develop. He later told the buyer, "I did have trouble over that Kirksite job,trouble with Inventory Control. We made a few samples for each of the observers sent in.When we finished we had enough for 2 years production which was far above acceptable inventory limits.

Through the buyers initiative, and the superior VA Function approach, he had "Mined some of the gold" from his waiting room to improve the earnings of his company.

...ldm...

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Written July 1984
By L.D.Miles

VENDOR VA TRAINING HELPS BUYER TO CONTRIBUTE MORE QUALITY AND LESS COST

Buying is such an exciting job partly because it is always operating at the cutting edge of the "New and Better". Every item we buy is the result of one or more responsible people's decisions. It is broadening to realize what a firm grip the past has on decisions of responsible people.

A pertinent example comes from the early development of the telephone. When the Brittish parliament heard Bell's invention, a parliamentary commission was established to listen to testimony of expert witnesses and to make recommendations. One of the members, the chief engineer of the British post office, when asked "Will this talking over wires be of any use in Brittain?" responded, "No Sir, the Americans need it but we do not, we have plenty of messenger boys"

The buyer is positioned to bring new knowledge to responsibile decision makers both in his company and in supplier companies. In today and tomorrows competitive world, he better make sure that he does it. If a new approach seems wrong, check it out. Perhaps that is why the competition is not using it, and maybe, it is really the best way to go.

Certainly to spend the companies money to buy training for vendors, who are free to sell their skills anywhere, seems wrong. Better to spend that "on our own people", all of whose contribution comes back to us! But, experience is proving that it isnt so,as related to Value Analysis Methods Training,perhaps because it teaches the supplier exactly what functions are needed,how these functions must be performed to maximize quality,how to learn to provide those functions by using the latest and best of the past and current art to assure competitive costs.

Let us take examples from the winners in Industry,and see what they did. The surprising success of Jet aircraft brought an unbelievable amount of opportunity and necessity to the Boeing Co. Bigger jets, better jets,safer jet more fuel efficient jets,more convenient jets,jets efficient for flights of 300,1000,5000 or 10,000 miles were needed. The problems,the opportunities, and the investments did defy imagination. What did they do?

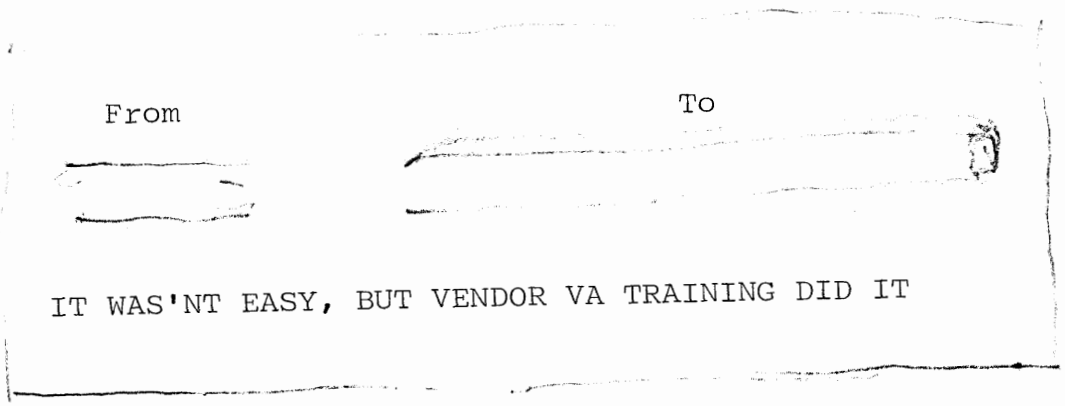
They started to work on it. They saw in the Value Methodology means to concentrate each professional employee's mind upon,"Just What Am I Trying To Do". Then to use the collection of Knowledge and the development of Creativity sufficient to achieve it.They hired Qualified Consultant Companie who trained thousands of Boeing People.

They searched out existing materials and means for accomplishing the need functions. They modified materials and processes and systems for accomplishing the functions. They created new materials and new systems when necessary. They tested, rejected,improved. Finally, this great creation, the Boeing 747 was ready to go into - but no, a brilliant management took one more great step.

Because of considerable success with the application of Value Analysis to various commercial,military and space projects,they decided to provide Value training to their major suppliers of components for the 747,then release it for full scale production. They invited their suppliers to send teams to Value seminars which were arranged and lead by the highly skilled consultant Roy E Fountain. The teams brought projects which were products they were supplying for the 747. The only obligation the suppliers had to Boeing was to requote after they had had time to review the proposals that were developed in the seminar. Benefits came in the form of increased quality,reduced weight,reduced volume or reduced cost.

One unusual benefit came in the form of drastically less scrap from some very costly special magnetic steel required in a special alternator. Two suppliers made the small special steel billets from which the usable materia was machined. Both provided the billets at about the same very high cost per pound. Because it was a newly developed material, both billets were very small and irregular in shape. Quantities were becoming larger.The enormous waste in scrap steel and in machining cost looked wrong.
One company said, "No change". The matter was brought to the attention of an officer in the other company. He said,"It isnt right,we'll fix it". He made a trip to the mill. Soon a new billett was provided. It was geometrically shaped for producing the parts which were machined from it and was much larger. It still was priced at the same price per pound, but scrap material, and machining costs were reduced by more than 10/1.

SPECIAL STEEL BILLET



[Note to Artist This really needs the sketches to help tell the story.
As you see - I'm no artist, but you are, so you can sketch them.
The small one at the left should be roundish and roughish.
The long one at the right should be quite rectangular and smoothish.

Thank you, L.D.Miles]

L. D. MILES
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Written Sept. 1984
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THE BIGGER THE "DEAL" - THE BIGGER THE PAY-OFF FROM VA PRINCIPLES

Chris Steenstrup, an apprentice boy machinist, came from Holland to Sche ectady General Electric in the 1920s and put together a product that the wo instantly took - the hermatically sealed refrigerator system.To compress th refrigerant gas, he used a small - back-and-forth cylinder - operated by a crank shaft.

Our fascinating story, illustrating the operation and use of human minds begins 30 years later in the mid 50s. We will call this story, "When A Valu Analysis Principle Was Not Used".

Top engineers and scientists in the Schenectady Works Laboratory decided that a, then modern, rotating compressor pump would have many advantages, less noise, lower cost, consume less energy etc. With a profitable high qu ity production of 3000 per day, the refrigerator department management were dead set against risking such vital changes.

The company president heard the laboratory people's story and gave them budget of several million dollars to prove out their beliefs, one way or an other. My memory, which may not be accurate, tells me that it was about a t year project. Finally the laboratory told the president,"We have proved in design. We have built dozens of them. We have tooling that makes them relia They have many advantages by comparison to the reciprocating design, quiete less energy use,more controllable, smaller and more.

The president set up a meeting in his board room at 570 Lexington Ave.NY to which about the top half dozen of the operating department and of the la oratory were invited. He told the laboratory to bring a refrigerator which contained a rotary compressor. Demonstrate it. Present data and comparison

The somewhat perplexed and dissappointed president, in due time said, Apparently there still remain unknowns. With our high production of high quality refrigerators,the risk of change is too great to take. We will stay with the present compressor pump. I will have all developmental budgets on the rotating pump cancelled as of tomorrow. To the laboratory he said,"Take a good look at means for improving the present pump".

The decision was made. People left. It was then seen that the refrigerato cord was not plugged into the wall outlet. The janitor had cleaned the room. All had Assumed, and the laboratories case was lost.

The story picks up again 30 years later. In Sept.1984 I was in the GE refrigerator sales office in Easton. The manager said,"We'll be coming out with a new refrigerator which will obsolete everything in use now. It has a rotary compressor which is small and very quiet,uses much less energy and is perfectly controlled to run just what is needed by new solid state contro We are already using rotary compressors. We have a great product.

Estimating, for the moment the economic return if one of the laboratory people had had a Value Analysis check list of Results Accelerators. # 6 migh help him avoid assuming it was "Plugged In". On the basis of only 1,000,000 refrigerators per year, and if the reduction in cost for the simpler better compressor was only $3.00 each - that"s $90,000,000 in 30 years. If the savi in energy was only $5.00 per unit per year - and it,I am sure will be much, much more, that is another $5,000,000 each year from each years sales. The benefits are mind bogling.

The conclusion is. Here is a group of techniques which are to help everyo better achieve what he is trying to do. Learn them. Use them. Keep them in mind.

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Written Oct 1984
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TODAY'S PURCHASING MANAGER CAN BE AN ENORMOUS CONTRIBUTOR

Todays Purchasing Manager is a team captain.His team is in two major part his buyers, and his vendors. His results grow from his actions,his buyers actions, and his vendors actions. To the extent that he trains,leads and challenges his two teams superior quality and cost benefits grow.

One interesting approach taken by some is, that at least 25% of our purchases could be provided with the same good quality at 25% less cost. To get the thinking into practical terms,the following "Class of Improvement" scree is used: CLASS OF IMPROVEMENT

____ Better Idea

____ Better Design

____ Better Supplier

____ Better Manufacturing Method

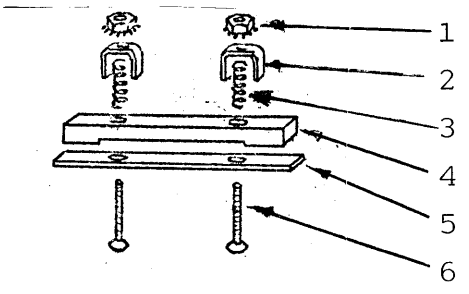
____ Better Use of Something Available.

Cards showing achievements are made up and used in buyer training in Valu Analysis methods. Often high and effective motivation is achieved. The same cards, with exact costs deleted are used to motivate vendors to produce similar increased values on items purchased from them.

Often individual item benefits much exceed 25%.

An SOS came to a buyer of refrigerator production line materials. The tiny springs used to help make the magnetic door closers perform could not be found. With production running at 100 refrigerators per hour which could not be finished and shipped, the little springs caused a big problem. Within an hour a laboratory "Spring machine" was set up, was making springs and a runner was taking them to the production line. Of course the buyer soon had the main source of supply flowing again, however he elected to try his IM-PROVEMENT FORMULA on the assembly which had been the problem.

Holding/refrigerator upright and freezer doors by means of small magnets instead of latches was much better. However, because of the build-up of a little pressure inside, and sometimes because of some sponginess of the insulating strips around the door, there was a problem. The door,when closed too fast, sometimes bounced a little, and was then outside of the reach of the holder magnets. The correction used was to provide a little springiness in the mounting of the keeper in the edge of the door, so that, if there was bounce, the spring pulled the door back closed. The assembly which did that, is shown below.



To find probable improvements, the buyer made two projects of it. One was part 4. The secon included parts 1,2,3,& 6. In each case he considered the five steps of his Improvement plan.

Function study, securing more knowledge,Creativity, securing specialists who might have processes not known or used in design or manufacture or use were included.

RESULTS Part 4

____ Better Idea

____ Better Design

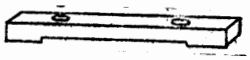
__X__ BetterSupplier

__X__ Better Manufacturing Method

__X__ Better use of Something Available

This part was machined and milled from steel bar.It had only USE function - to hold magnetism. It was embedded in the material of the door, could not be seen, so had no aesthetic function.

A specialty supplier who had built and used equipment for coining, even very heavy steel, was invited to look at it. He could start from the steel bar. Each time his press came down, it coined a piece,punched the mounting holes in it, and cut it off. It produced the same part, excepting for somewhat rounded corners, which for the function, made no difference.



76¢

As originally purchased

36¢

After the buyers work

RESULTS Parts 1,2,3,& 6

____ Better Idea

__X__ Better Design

__X__ Better Supplier

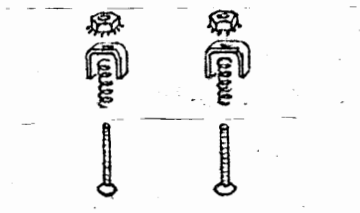
____ Better Manufacturing Method

__X__ Better use of Something Available.

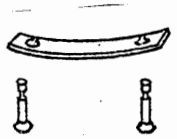
These parts had the USE function of holding the assembly together and of mountingit to the refrigerator door. The parts which could be seen were the outside surfaces of the two heads of the screws,so they also had AESTHETIC function.

The buyer bought flat type springs instead of coiled springs for some other applications. He invited a company which supplied them and applied them,to study the application.

The result was a change in the manner in which the necessary "Springiness" function was secured, and in the costs involved.



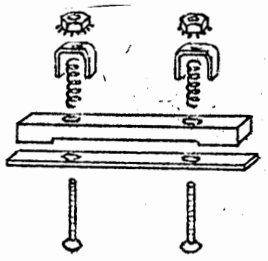
28¢
As originally purchased and used



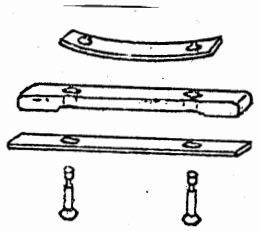
6¢
After the buyers work

Quantities were 1,000,000 assemblies per year. Again, pay-off for the work of the buyer who learns and uses good Value Analysis methods and good energy, is incredably high.

Part 1. From 76¢ to 36. 40¢ each	Annually	$400,000.
Part 2. From 28¢ to 6. 22¢ each	Annually	220,000.
	Total	$620,000.



Assembly before change



Assembly after change

Identical performance of both USE and AESTHETIC functions. $620,000 less cost per year.

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