

# A CONVERSATION WITH ROY FOUNTAIN...



E. WILL  
DEARBORN

*Special Feature Writer*

DEARBORN: Roy, you've been in Value Engineering for a long time.

FOUNTAIN: I started to work for Larry Miles in 1952. I was trained by him.

DEARBORN: That was during that period when Miles was forming the concept that became known as value engineering.

FOUNTAIN: Yes. Larry was given a job by the vice-president of purchasing who recognized that a lot of the times during the war they were forced to substitute materials or go out of business on particular products and one of the most notable ones was refrigerators. Up until that time I guess every refrigerator manufacturer made shelves out of stainless steel and they were told by the War Production Board that stainless steel could no longer be used. Curiously enough, aluminum was available but they had tried aluminum a number of times before and now were forced to use it. They finally found out how to use it and now every refrigerator manufacturer in the United States uses aluminum for shelves. As a matter of fact, one of the other things that was noted when a lot of these substitutions were made was they actually got a higher quality more durable product and at a lower cost.

The Vice-President of Purchasing noticed that this happened frequently and he started out with rather simple but good thoughts that if this happened so often by accident that we should try to make it happen on purpose. He got Larry, who himself was a former school teacher, and an electrical

engineer to take on this assignment. Larry's first activities were centered around finding out where substitutions has been forced and where we did come up with a better product at lower cost. He documented these; then went back to try to see what it was that led to the change; how we could have made the change sooner; and if there was any technique involved. He identified a number of techniques which he organized into a teachable group and they were so called the twenty techniques of value analysis.

DEARBORN: Is there a difference between value analysis and value engineering?

FOUNTAIN: If you want to try to make a distinction between value analysis as being applied after the fact, and value engineering applied before the fact, then I think that's fine if that's a useful distinction. But, in too many cases we talk about terms and names rather than the specific techniques that lead to the results.

DEARBORN: Is there such a thing as pure Value Engineering?

FOUNTAIN: I don't even like to make the distinction of pure value engineering, or a value engineering project, or value engineering anything else. What we're really looking for is results. And, what we call it is not really so important, but the thing that is important is the technique that we use. We shouldn't have to make any kind of a distinction whatsoever, these are value engineering techniques—the technique of identifying the function, how to evaluate a function, how to establish standards of values. These techniques are applied prior to the design release.

DEARBORN: Value Engineering then is a method, a set of techniques, a result-oriented plan as opposed to a technical skill such as mechanical engineering or electrical engineering.

FOUNTAIN: Yes, value engineering like other management techniques is more abstract, let's say, than algebra or geometry.

DEARBORN: I take it then that there really is no term "value engineer."

FOUNTAIN: Yes, there is, without question but really you need to go back to say why have any specialty whatsoever, why even have an engineer, why not just have a manager. In many small businesses, that's all you really have. What happens when the business gets so big and the field of knowledge gets big enough then you finally specialize, so the first thing you know you have an engineer. The next thing you have to do, you have to have a mechanical engineer and you have to have an electrical engineer. Why? Because no one man can perhaps accumulate all this knowledge. The next thing you have is a metallurgist, and you may have a chemist and a physicist and so on down the line. The only reason for this specialty really is the field of knowledge gets so big that one man can't know it all.

DEARBORN: Now you've got me confused.

FOUNTAIN: Really the ideal situation would be to have everybody know all there is to know about value engineering. It's too bad that everybody couldn't have all the knowledge that they really should have so that we didn't have the specialist at all. I'm sure as society gets more and more complex that we're going to have more and more specialists including specialists in value.

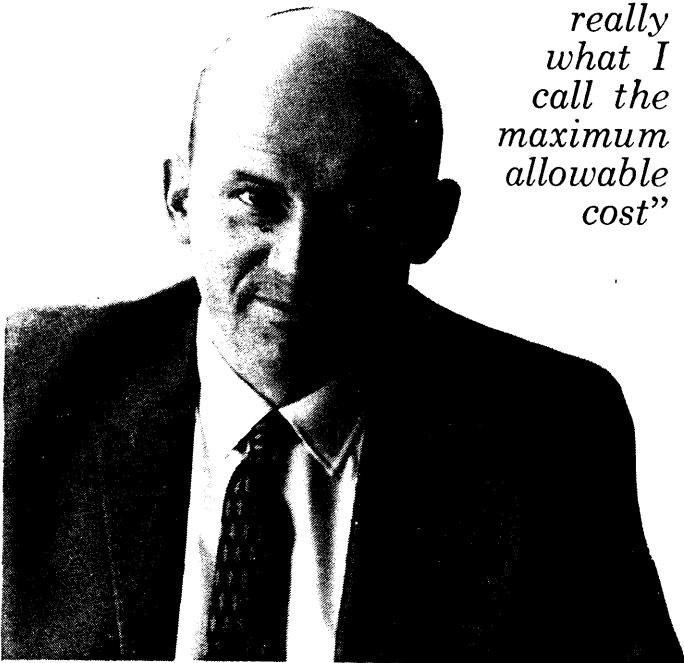
DEARBORN: What would a specialist in value be trained in? What would he have to know to be truly effective

as a specialist? Would he just have to know the techniques?

FOUNTAIN: I think a good analogy is a metallurgist. What does a metallurgist have to know? He has to have a good knowledge of metallurgy. Then what does he have to do? He has to communicate that knowledge so it can be used. What is required to communicate it? It's required that the man to whom he's going to communicate this knowledge also has some knowledge of metallurgy. Thus we have every engineer trained in metallurgy to some degree, but we also have a specialist to whom this engineer can go. They couldn't even talk to one another unless they had some common knowledge. Therefore, I think in value engineering you've got to have an engineer, who has some knowledge in value. For the more specific and complex, more difficult situations, he may very well go consult a value engineer, who really relies on his knowledge of value engineering and supplements the knowledge of the person who needs help. Back to my old analogy of the metallurgist. Why did the metallurgist succeed? He succeeded first of all because the people he deals with had some knowledge of metallurgy and this guy has a great deal of knowledge in metallurgy. He does not go around after the fact pointing out faults in places where somebody used the wrong material, he consults with people ahead of time so that they do use the right materials, they have enough respect for his knowledge that they go and consult him before they make the decision. This is the kind of situation that you need. I think that you also need a management climate that says, "we want you to use these techniques if they're useful to produce a profit, and a better profit."

DEARBORN: Value Engineers have been referred to as "cultists." Do you think that the label has been attached because Value Engineering received its

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greatest push simultaneously with a number of image building cost reduction programs initiated by the Government?

FOUNTAIN: I don't know really how the word cultist and value engineering got together but I think it's extremely unfortunate, I don't think it's a cult, it's no more a cult than any other good tool that you would want to mention. Algebra is not a cult, differential equation is not a cult, materials, producibility is not a cult, production control is not a cult, I think that's a very unfortunate expression and there's no need for it and I don't think it accomplishes anything. One of the things that psychologists say that some people are motivated by pleasing methods and some people are motivated by pleasing results. A lot of value engineers I think have probably had the name tag of cultist hung on them because they were very interested in the pleasing methods that they were using, but they didn't follow through to really get the pleasing results.

DEARBORN: I think that the "cult" term has grown in the absence of evidence supporting a body of knowledge regarding the value engineering activity.

FOUNTAIN: There is a body of knowledge that you can point to, and I think with a lot of the people who are labeled cultists the only thing they can point to is a discussion about what you should call it and a discussion about the value job plan and such things as this when they have really no knowledge to support them. And, to that extent they were labeled cultists. The body of knowledge starts with the fact that you work on functions, not things, you then define a function as two words, a verb and a noun, to keep the specification separate. There are ways of identifying functions so that the function statement will not have an implied solution within it. There are methods used in creativity which really value analysis cannot lay an exclusive claim to. Really, value engineering, or value analysis, is a collection of good, sound, common sense techniques. I have been accused of teaching organized common sense, and if I had to teach anything I think that's exactly what I'd like to teach.

DEARBORN: We've established, to use your words, "the ideal situation would be to have everybody know all there is to know about value engineering." We have suggested that the field of knowledge is such that there could be value specialists just as there are metallurgists, aerodynamists, structures . . .

FOUNTAIN: Materials, production, contracts.

DEARBORN: Yes. Let's talk for a moment about the design engineer . . . the man who conceives and creates our products. Why should he be concerned with profit?

FOUNTAIN: I don't believe anybody can be a good engineer or good purchasing man, good accountant, good anything else, unless he's concerned with profit. We have to be in this day and age. Since profit is the final objective, I don't think you could do any job well unless it's considered.

DEARBORN: Do you think that the average design engineer is motivated by the profit or loss statement at the end of the year?

FOUNTAIN: No, and I'm glad you asked that question because if I could, I'd like to tell a personal story. At one time when I was a design engineer, I worked with a marketing man who broke all the rules in the book. They would have fired him except they couldn't get along without him. He made too many sales. This marketing man would go out and make

a sale, he had already made up in his own mind, how much profit he wanted to make on the sale. He would go to the financial people and tell them about the sale that he had made, and how much money he would like to make. He would ask the financial people to run the figures down to give him the cost, in order to make that money. This marketing man would then come to me and say I have sold so many units of this item. I have sold them for this price, and I want to make 20% and that means you have to design it so that we can make them for this cost. If you do that, we'll make so much money, so much profit. He said now, if you could make them for a lower cost, we'll make this amount of profit and I'll sell "X" number of more units. If you make them at a still lower cost, we'll make this much money and I'll sell "X" number of units. Generally speaking it has been my experience that engineers get satisfaction from one thing, and that's in making a product that works. Very often they have no idea how much it costs nor its contribution to company profit. While I worked with this man, this man who broke all the rules in the book, who never went through my boss or through his boss, I got twice as much satisfaction because when I went home at night, I got satisfaction from having designed the product that worked and I also got satisfaction because I knew how much money, how much profit, I had contributed to the company. I think this must be done, we must measure everybody on their contribution to profit, and the man ought to know what that contribution is.

DEARBORN: You were motivated.

FOUNTAIN: I was motivated.

DEARBORN: You had a target . . . a cost target.

FOUNTAIN: I had a *profit* target.

DEARBORN: Not a cost reduction target.

FOUNTAIN: Profit targets. Very often they are interpreted in terms of cost. For example: one company was losing its share of the market, losing its profit margin. They knew the cost of the product; they knew the price they could get; they knew what profit they wanted. They translated this profit and the price into a new cost and said "this is the new cost objective." In this case they assigned value engineering trained people to attain that objective. It was a cost objective but it was derived from a profit objective.

DEARBORN: Should you operate on targets or value standards for the function?

FOUNTAIN: They should be one and the same thing.

DEARBORN: Pretty obscure though to talk about value standards and functions . . .

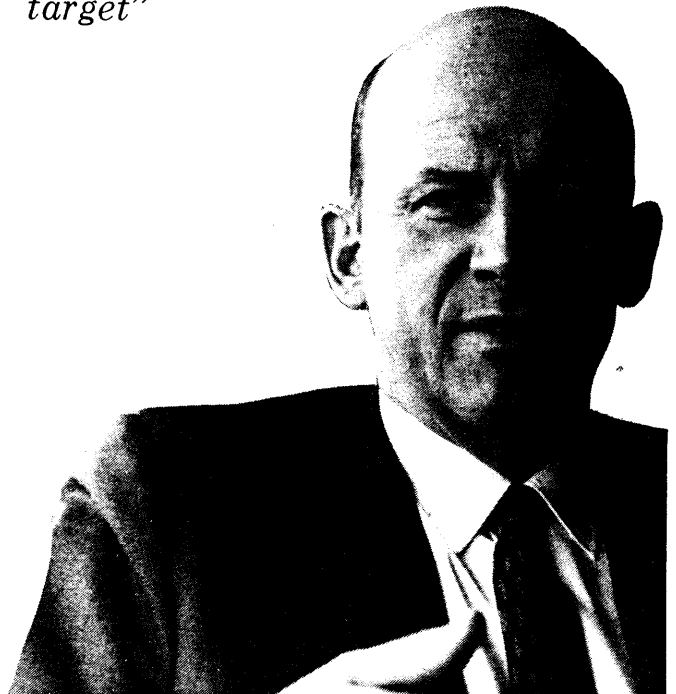
FOUNTAIN: Wait a minute, the cost target again is a term that needs explanation, it means something different to every person. Most cost targets that are set by industry today are really what I would call the maximum allowable costs, by that I mean that somebody has sold something, they want to take a certain percent profit and that establishes a maximum allowable cost. And that, therefore, is called the cost target. The kind of target that I'm really looking for is what I choose to call an attainable cost, perhaps a minimum attainable cost, and it is certainly different than the maximum allowable cost. It can be substantially different. Now, having established an attainable cost, through the way we do cost targeting, we can also establish the manpower requirements and everything that's required to get there. Having done that, we can decide, o.k., our

targeted cost objective for this year is a 10% profit. We can make 30%. Do we want to employ the manpower to reach this objective this year? Or, do we want to do it in steps? Many commercial companies for example will do it in steps, because by doing it in steps they can reduce their peak manpower loads and they can also introduce changes on the timely fashion and since many companies copy many other companies, they'll introduce a change at a certain level; hold it at that level until their competition copies and as soon as they copy, they have new designs already to go, they introduce it to the market and they drop the price. Thus their competitor is caught off balance, he never gets to recoup for the cost of his advertising, and the cost of his engineering, or anything. The successful company, and there are several of them around that are doing this, will actually have targeted what is an attainable cost out several years in the future. This is done on a planned basis, and they are completely in control of the situation.

DEARBORN: I don't feel that our product line lends itself to that sort of manipulation.

FOUNTAIN: I'm really glad you brought this up. People say our product doesn't lend itself to cost targeting. You can do it, and one thing we can really offer in value engineering is an improved process by which you could arrive at a more realistic target and one in which you have more confidence. If you want to take it a little bit further, it's what you would really like to do is to get it to the point at which engineers, let's say working on a landing gear . . . we got this kind of a cost target because the company said this has to cost so much. Now let the engineers use the techniques of cost analysis and function evaluation and establish for the management what would be in their estimation a realistic obtainable cost, and tell them what kind of manpower is necessary to do that.

*"I had a profit target"*



## FOUNTAIN (Concluded)

DEARBORN: Why then have we in large industry consistently failed to establish targets for use during the design creation phase?

FOUNTAIN: I think in many cases, we have not known how to define the targets, in the beginning. We may have value engineering training, but still do not explain how you do it. But, we're saying it ought to be done in the beginning, but in some cases that's all that we can say. We haven't had people telling other people exactly how to do it. Again, when you say targeting I hope we're talking about the sophisticated kind, not that we knew all there is to know about it today, because I think better systems will be developed, but some good approaches that can be used today are not being used.

DEARBORN: What characterizes those companies which have successful value engineering programs?

FOUNTAIN: I think that a lot of them who are very successful first of all have good training programs, they have people trained in using the value engineering techniques. They have a management who understands how to establish targets which include not only performance and delivery and all the usual things but also cost or profit as well. By the targets that are established the men are actually required to use all of the best techniques that they have available which includes value engineering. As a result of this, these men tend to do a better job.

DEARBORN: What sort of a value engineering organization works most effectively?

FOUNTAIN: I think basically organizations that have as their objective the providing of service, consultation, guidance, training and leadership, all of which may occur simultaneously, have probably been the most effective.

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Dear Mr. Sheehan:

It is my great pleasure to inform you that by a unanimous action of our National Board of Directors, you have been elected as a National Honorary Vice President of our Society.

The work you have done and the success you have achieved by supporting value engineering in your company demonstrates again the high potential of value engineering as a management tool for profit assurance.

Cordially yours,

Frank J. Johnson  
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10 March 1969