

ABRIL - 1960
Vol. 1 N.º 8

O Dirigente Industrial

REVISTA DE ADMINISTRAÇÃO, PRODUTIVIDADE, EQUIPAMENTOS E PROCESSOS

- ▶ Como planejar ou modernizar sua fábrica
- ▶ Dirigentes também devem ser treinados
- ▶ Aumente sua produção com música funcional
- ▶ Grampeamento concorre com solda e rebites
- ▶ Suas máquinas precisam mesmo ser trocadas?



Conheça
função e valor
de cada peça

KNOW THE FUNCTION AND
THE VALUE OF EACH
PIECE

Um Artigo Especial
sobre

Análise do Valor

(Páginas 47)

MAY 20 1960
C. W. BRYANT

If the equipment in your factory is up do date, and if the production department makes use of the equipment with maximum efficiency, you may be tem ted to cross your arms, believing there is nothing more to do to reduce your costs. But now is the time when your business is ready to adopt a new technique, value analysis, and get an additional cost reduction of 20%.

Companies which already make use of value analysis state that, in fact, it is not a substitute for the traditional method of work simplification. On the contrary, it starts exactly where the influence of other technicians end, and it allows the realization of additional savings even after the costs have been reduced on a large scale.

In accordance with the experience of General Electric S/A, Janto André, SP, one of the pioneers of this method, it is applicable to any sort of manufacturing, and when well conducted, becomes a strong instrument to improve the position of the products in the market.

BASIC PRINCIPLES

Value analysis teaches the concept that the value is relative.

If a part is produced at a price of 10 cruzeiros, and with the new method is able to be manufactured for 5 cruzeiros. Has its value been altered? Probably not. Therefore, the value of an object or service can only be determined through comparison. For instances: the value of a fan cannot be determined through its cost elements, but through the comparison of other equipment able to carry out the same function, which is to move air.

The new technique is, therefore, in first place, a evaluation of the function of each object. The analyst selects a

part and observes it. Is it the best one to carry out that function? After the comparison with other parts which could satisfy the same objective has been made, the analyst attempts to establish the usefull value of each of the parts examined. The preference will fall, logically, on that of lower cost.

One of the basis rules, nevertheless, is not to reduce the quality of the product. During the analysis tests are made to find out if the elimination of any detail will affect, in any away, the characteristics of the final product.

In the opinion of Mr. Frank P. Fleming, GE Materials Manager, Janto André, and responsible for the value analysis, this technique is, essentially, a real creative study of each production item, with the objective to relate the cost with the value of the function or service.

WHO DOES THIS WORK

The enterprises make use of different ways to carry out the value analysis. A British company, for example, appointed a technicians team to study in detail each of the most important products. One of the technicians is the value analyst.

Other companies, and among them GE, maintain a permanent value analyst. In addition to leading the research, he is also in charge of the training of new personnel who can, in the future, assist him in his work.

Practically, the value analyst observes various products at the same time, but usually he concentrates his attention on one product at time. Besides needing special training on analysis methods - states Mr. Fleming - he must have solid knowledge of the type of manufacturing of the plant. In other words: he will be selected preferably among engineers and technicians who have already worked on and have become familiar with the product and

its components.

HOW TO LEAD THE ANALYSIS

In accordance with the experience of Sr. Sérgio Alayon - GE analyst - the first step is to disassemble a component so that each part can be analysed separately, in order to find out: what it represents, its function, its cost, and what could take its place at a lower cost.

The schedule of work, is divided as follows:

- 1 - Collection of information - obtaining facts.
- 2 - Investigation and research - ideas and suggestions
- 3 - Component Analyse - determination of the objective
- 4 - Action Schedule - selection of a new method and schedule for implementation
- 5 - Performance of the Plan - solution of the problem
- 6 - Conclusion - resume and additional data.

On the first phase of the work, the analyst gets drawings, and if possible, a sample of all the parts which he intends to analyse. Following he prepares a list of all these items, making notes of all necessary operations for its manufacture, or data relative to its purchase. Then he computes the cost of the material, labor, and manufacturing expenses. It is very important that all the information come from reliable sources. Often, people not directly responsible for the part being investigated may supply wrong information.

Finally, in possession of all the information, the analyst initiates his research. According to Sr. Alayon, this is the time when the analysis takes the form of creative thought.

What does creative thought mean? The value analysis technicians definition is "absence of negative thought". In other words, it means that we should think of all possible solutions

without immediately starting to judge them. People, say the technicians, when having a problem to be solved do not become satisfied in looking for a solution: after it is found, they start to examine the pros and cons, and often find reasons to reject it.

For creative work, this procedure is incorrect. The analyst should make use, in great scale, and without any preconception, his ideas and ideas of anyone else who can help him. He should encourage the use of imagination, not objecting beforehand, which then would result in destroying initiative. Only in this way, the analysis will show positive results.

TESTS APPLICATION

Searching for ideas and suggestions, the analyst must answer questions such as:

- . What does this represent?
- . What is its real function?
- . How much is it worth?
- . What could replace it?
- . How much would it cost?

Simple answers to these questions may perhaps result in a solution.

As a result of the experiences of various manufacturers, another efficient way is to make various tests of the part being studied. If the part is approved after the various tests, there will probably be a method to reduce its cost. And, almost always the test itself suggests where and how to reduce the cost.

Here are some of the tests usually made by the value analysis technicians:

- 1 - Is the use of this part, material or service really necessary to complete the product?

Though this question seems clear, the answer may be surprising. In GE Refrigerator manufacturing, for instance, the packing boxes, until some months ago, were fastened with zinc plated screws. After delivery to the customers' home, the screw had no function. Value analysis showed, in first place, that the zinc plating was unnecessary, and this was soon eliminated. But the analyst was not satisfied. Would not there be another part to perform the same function? So, he soon discovered that one of the levelling screws of the refrigerator itself could be used in the packing box, and after the packing was removed would be used to level the refrigerator. The suggestion was approved and an additional screw eliminated.

2 - Are all the details or service of such parts necessary?

Occasionally the parts are more complicated than necessary and a simple part would accomplish the same function. Simplification, however, should not remove details which, though apparently unnecessary to the function, please the purchaser. Often, the elimination of cost is achieved by combining the function of one part with those of adjacent parts. Always taking GE as model, a good example of the application of this principle is the case of the shim of the refrigerator compressor. In the past these shims were bought as a standard item on the market and stacked until the desired thickness was reached. Now a single piece of extruded rubber, especially drawn is being used, reducing by more than 70% the cost of this part, and resulting in a better performance.

3 - Can any other product do the same or better the performance?

There is also the possibility that as a result of analysis the use of a new part results in a higher cost than the original. The reason is, usually, more superior efficiency and a longer life, which would result in economies as a result of longer life.

But the objective is to look for an answer to this question and to find a piece that can do the same job, or a better job, at a lower cost.

The GE technicians recently replaced the glass shelf of the vegetable pan of the refrigerator for a plastic cover. During the analysis the acceptance by the customer was taken into consideration and the conclusion was that the plastic cover, besides being more economical was preferred by the customer because of its superior durability.

4 - Can this part be made by a simpler method?

Generally the value analyst does not get into the technical details but thinks more of the economical aspects of the part. He concentrates on working mostly with others to determine that methods and processes are accurate and if not make corrections or suggestions which in many cases result in higher and more efficient production.

5 - Could a standard product be used?

The use of standard parts such as screws, nuts, rivets, etc., may result in a substantial reduction in the cost. Many small parts which are being manufactured to special drawings may, easily, be replaced by others which can be easily acquired in the market.

6 - Is there any supplier that can offer a better price?

The problem is not just to investigate among different suppliers, as this work is normally done by the purchasers, but, also verify if some of the parts which are being manufactured in the company itself could be purchased for a lower cost, or that parts currently being purchased could be made in the factory thereby resulting in lower costs.

7 - Are other Companies getting parts for a lower price?

At times a supplier may establish different prices. It is worthwhile to investigate the possibility of getting discounts by purchasing higher quantities. It may be interesting to increase the stock supply to purchase on better terms.

8 - Is the equipment being used adequate in relation to the part's worth?

There is a possibility that expensive equipment is being used to produce items of limited functions, or of small production. If necessary, the engineers may redesign the part, allowing the use of simple machinery. In a manufacturing Co. in Campinas, for example, a value analyst discovered that the grate for the protection of a motor which was being produced in small quantities was being made of soldered wires. A special soldering machine was used for this operation. The same part was redesigned and the result was that it was stamped in a punch press reducing the costs considerably.

Often, during the application of the tests the analyst is faced with objections from other Section personnel. In the opinion of the analyst such reactions are normal and can be cleared with positive attitudes, and human-relation, maintaining the conviction that they can be eliminated. In many cases to overcome objections is just a question of good-sense. Some of them may be fundamental, but some are tradition habits, or personal attitudes.

WHERE TO RESEARCH

Value analysis may be initiated, in all the sections of manufacturing as, purchasing, product engineering, Manufacturing, Procedures, etc.. In the opinion of Mr. Fleming, it is advisable to

concentrate the efforts on materials, which often represents approx. 80% of the total product cost.

The areas to investigate are practically unlimited: parts of all sizes, large or small, old and new methods, are subject to investigation with possible costs reductions. Most important is to create a desire within the organization to fight against the hazards of habit and tradition.

In the manufacturing area many activities are often reduced to refinement work, to improve on what there is. The value analysis, in addition is continually reviewing what is being made and also looks for new ways.

Acting in all the sectors of manufacturing it may seem to be a duplication of effort. Nevertheless, through its operation it is possible to reduce unnecessary costs in each product. And, its increasing affirmation and success rest on this reality, and not on a logical question.

THE RESULTS

Karl H. Pearson, GE Cost-Section Manager, Santo André, prepares a monthly report on the savings realized through the value analysis program. He states that through the passing of the years the savings are becoming more and more realistic. Just in the steel section, the analysis and revision of sizes, methods of preparation and finishing, allowed the company to realize an annual saving of 4 million cruzeiros.

In the opinion of Mr. Pearson, the Brazilian manufacturers may expect results even superior to those reached by other countries. Such feeling is due to the fact that our industrial development is proceeding at a high-speed and many products or materials difficult to be found a short time ago, suddenly appear

on the market.

Other proof of the success reached by GE is the intensive training activity. Actually, fourteen technicians are attending special courses on value analysis, and by the end of this year an additional thirty people will be trained.

The fact of knowing better the costs, suggests that something must be done. And, the technicians soon find out that value analysis is an instrument that cannot be replaced by any other, to reach the objective of: provide better performance by the same cost, or to obtain the same performance at a lower cost.

MAIN PHASES OF VALUE ANALYSIS

1 - Information Collection

- A - Get all information; when possible, also samples of parts or assemblies; information regarding drawing, specifications, technical characteristics, production and cost methods.
- B - Learn with the technical engineers. Ask questions, listen and try to learn the technical aspects of the product being analyzed.
- C - Decide what effort you will spend on each item, in accordance with its cost and value.

2 - Investigation and Research

- A - Analyse each possible solution of the problem.

- B - Consult anyone who can assist you.**
- C - Try various materials, procedures and machinery, systematically.**
- D - Encourage the free use of imagination.**
- E - Take notes of all suggestions, even those which seem to have little merit.**

3 - Analyse of the Problem

- A - Estimate the cost savings of each idea.**
- B - Develop each idea, giving special attention to the eventual cost and to the possibilities of savings.**
- C - Investigate deeply the ideas which provoke objections. Examine the pros and cons before abandoning them.**
- D - Establish objectives and develop completely the more promising ideas.**

4 - Action Schedule

- A - Divide your work in progressive phases.**
- B - Decide who to consult in each phase.**

5 - Execution of the Plan

- A - Clearly determine the principal function of the item. Talk about it with specialists.**
- B - Try persistently the possible solutions, till you reach**

a practical and acceptable conclusion.

6 - Conclusion and Resume

- A - Write the final suggestion, indicating all the possibilities.**
- B - Include in the suggestion the following data: draft of the existing and of the proposed; annual usage; material, labor and other costs; modification cost; description of the items function.**
- C - Send copies of the suggestion to all possible interested persons.**
- D - Attach all data and additional information which may better clarify the suggestion.**
- E - Reach a conclusion as soon as possible and start to examine another item.**