

NEW METHOD OF COMBINING IDEAS



Kazuo Imaeda, CVS

Mr. Imaeda is Senior Staff at Product Cost Control of Product Planning Office, ISUZU MOTORS LTD. Since he entered ISUZU in 1979, Mr. Imaeda has engaged in cost planning, cost reduction activities, and Value Engineering (VE) promotion. And now, he has been promoting commonization activities.

ABSTRACT

In this paper, problems in the current method of combining ideas in each job step for generating, materializing and refining ideas are clarified, and clues to solving these problems are sorted. Then techniques for overcoming the problems are proposed.

INTRODUCTION

These techniques are intended to enable us to steadily climb the job step of combining individual ideas, and to help our ideas materialize as products. In the step of generating VE ideas, brainstorming method is applied to each function group to come up with as many ideas as possible. By this method considerable number of ideas are exposed. Good alternative proposals can not be brought about just by generating many ideas. Categorizing and sorting the ideas are necessary. Ideas are grouped into types, narrowed down through technical and economical evaluation, and combined with each other until the ideas are boiled down to a few final candidates.

Disadvantages in each candidate are picked up, and ideas for overcoming these disadvantages are sought to achieve as effective alternative proposals as possible. However, in most cases, actual VE activities at part suppliers' facilities are not conducted in such an ideal way, and we have more often been at a loss or got into trouble.

In combining ideas, is the spirit of each idea reflected? Are advantages in combination of many ideas made full use of? Does a combined idea lead us to valuable conclusion? The results of combining ideas largely depend on team members' skill, and influence the achievements of total VE activities.

There are several papers referring to this point. In

one paper, integration of ideas is facilitated by identifying beforehand the relation between functions of current parts. In another, efficiency in materializing ideas is improved by assigning high or low priority to generated ideas.

CURRENT PROBLEMS AND IMPROVEMENT POINTS

VE activities have been aggressively conducted at parts suppliers since 1986. In the activities, the following three problems in combining ideas have been identified; First, time for making effective alternative proposals is restricted within the framework of corporate activities. Ideas are grouped and sorted, but time for discussing the grouped and sorted ideas is too short to achieve effective proposals. Therefore, ideas are not well selected. Secondly, generated ideas are not effective by themselves. They are just clues to effective alternative proposals, and thus developing ideas and confirming improvement in value are necessary, but actually these procedures are not carried out in combining ideas, resulting in inconsistent or ambiguous combination. Thirdly, grouped ideas are combined forcefully in such a direction where the ideas are most likely to be combined, or by applying accustomed method, regardless of guidelines prepared beforehand.

To solve these problems, the I make the following two proposals for the job step of combining ideas during the process of materializing ideas among the procedures of function definition, idea generation and materialization in VE activities.

First, ideas are to be boiled down to the best or the second best one by applying evaluation standards to each function group of generated ideas.

Secondly, the ideas in each function group are to be successfully combined with those in other function groups by creating ideas which link the boiled-down

ideas, or so-called 'linking ideas'.

Detailed procedures in these proposals are discussed in the following section:

BOILING DOWN IDEAS

Proposed VE procedures are the same as those of the current method up to the job step where ideas generated for each function group are categorized and sorted. However, in the next step, ideas for each function group is evaluated again instead of studying combination of ideas from various viewpoints. Currently, ideas are evaluated by studying feasibility of value improvement in view of technology and economy. Actually there is no established standard for the evaluation, and thus evaluation results depend on members' skill and knowledge. As a result, many ideas are retained because ideas are thought to be neither readily dropped, nor be narrowed down to too few. Therefore, ideas should be strictly sorted out by providing evaluation standards for narrowing down.

The evaluation standards for identifying value improvement, or answer to the question "What is considered as value improvement?", should be prepared through VE activities of information collection. At this stage, evaluation objectives are not yet clarified, and thus ideas, simple and just including critical points, are fine. Figure 1 shows an example.

EVALUATION STANDARDS

EXAMPLE :

Is the idea useful in improving the value of a remover?

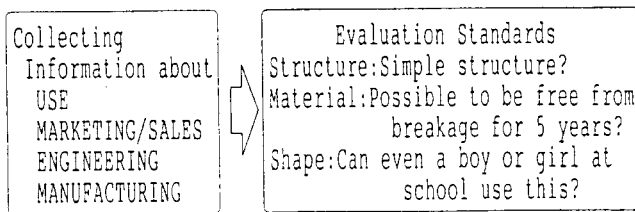


Figure 1

Next, ideas are sorted out for each function group by using the evaluation standards. At this stage, if possible, ideas should be boiled down to a few because, as the number of ideas retained increases, the number of combination of ideas grows large and thus studying the feasibility becomes more difficult. If such a situation is avoided by boiling down ideas at the stage of categorizing and sorting ideas, the activities in the next job step will be much easier.

If no idea that can improve value remains for any of the function groups, ideas should be generated again in that group.

Figure 2 shows an example of boiling down ideas for the secondary function of each function group by using the evaluation standards shown in Figure 1. This figure is a diagram of ideas, and can be a drawing of a possible new product as well.

NARROWING DOWN IDEAS

EXAMPLE :

function-1	
Unclinch	wedge, claw, scissors, lever
bent staple ends	bodkin, screw driver, pliers
	umbrella, bottle opener, spring
	vise, chisel, set square, stake
function-2	
Pull staple	spring, plier, tweezers, winch
	bottle opener, pry open, lever
	pincers

Figure 2

Up to this stage, activities are sequentially conducted on individual function groups, and, as a result, just ideas which function only for particular purposes are obtained. Alternative proposals, goal of VE activities, are not yet achieved at this stage. Combination of ideas for individual function groups should be studied to achieve the proposals as a result of total VE activities.

LINKING IDEAS

The second proposal is to generate ideas which link the boiled-down ideas. As the finalized ideas are best of ideas in each function group, combining these ideas is very difficult. So ideas which bridge gaps between structure, material, etc. as shown in Figure 3 are necessary. To create Linking ideas, the following three elements should be studied: Common, reverse and new elements, which should be studied in that order

CONCEPT OF COMBINING IDEAS

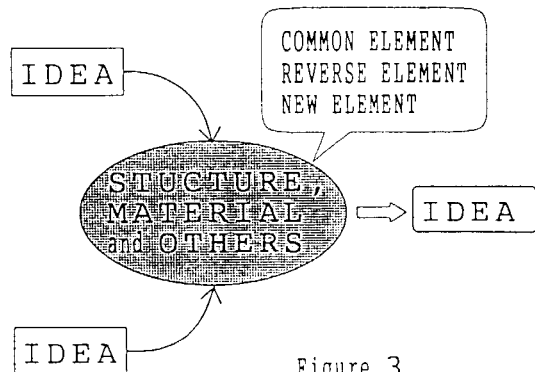


Figure 3

First, common elements shared by ideas are extracted, and then linking ideas are created by using the common elements. In the case of 'pipes' and 'grooves', the following linking ideas are created from common elements, such as 'round', 'space', etc.: 'Provide pipes with waviness', 'deformed pipes', etc. In most cases, the easiest way to create linking ideas is to use common elements.

If linking ideas are not found or satisfying, reverse elements for boiled-down ideas are extracted, and then linking ideas are hatched by using the reverse elements. In the previous case of 'pipes' and 'grooves', the following linking ideas are generated from reverse elements, such as 'rectangle', 'closed', etc.: 'Bend parts of pipes', 'double pipes', etc. If linking ideas are not found by using common and reverse elements, final means to find them is to use new elements regardless of boiled-down ideas. In the same case, linking ideas are, for example, 'place pipes in lines side by side', 'twist pipes', etc. Figure 4 shows a case of linking ideas generated in view of these three elements.

GENERATING IDEAS BY COMBINING THEM

EXAMPLE :

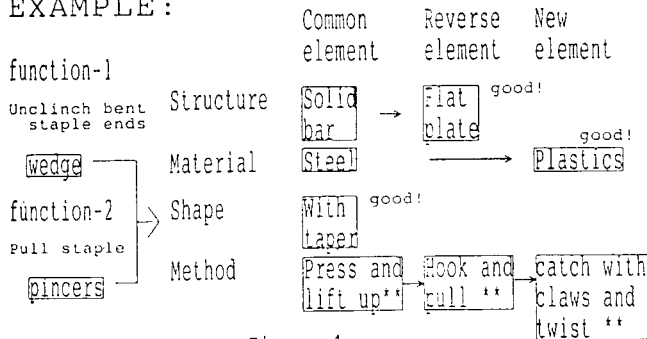


Figure 4

Boiled-down ideas in two different function groups are integrated by linking ideas in view of either one of the three elements. Linking ideas are generated by coupling boiled-down ideas with those in another function group. After the ideas in all function groups are coupled and linking ideas for each pair are generated, then the generated linking ideas are coupled to achieve a further integrated linking idea until all the ideas are finally boiled down to a single idea. As linking ideas are found one after another, we finally come up with "diagram of ideas", so to speak, from which specific proposals to improve products may emerge.

Figure 5 illustrates the difference between the aforementioned and current methods of combining

ideas. This figure will help form an overall picture of the method explained in this paper.

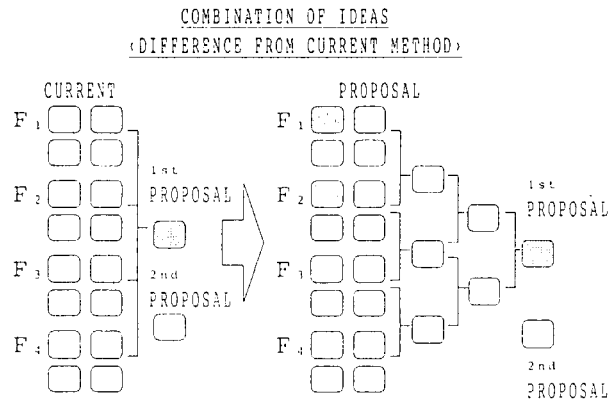


Figure 5

Generating ideas is a divergence process of ideas, while combining ideas is a convergence process. Linking ideas work as a switch for changing thinking process.

From this step onwards, the current VE procedures for materializing and refining ideas are to be carried out to achieve effective improvement proposals.

ADVANTAGES OF NEW METHOD

Even if the number of ideas created for each function group is large, the ideas can be narrowed down and combined by using the new method proposed here to raise alternative proposals. The following are advantages of this new method:

1. Generating linking ideas facilitates integration of ideas.
2. Applying the three elements one by one helps to further develop ideas.
3. Quality in this job step of VE activities is expected to be improved by combining ideas for each function group.

CONCLUSION

Discussed here is a method for integrating ideas created for each function group into alternative proposals without fail or much difficulty.

One of the bottleneck processes in VE activities is the job step of combining ideas. If efforts are not focussed on this job step, alternative proposals finally achieved will not be effective enough. This method is considered as a foolproof one for achieving effective alternative proposals.

In the future, VE activities will be further improved by verifying the effects of this method, and by proposing effective method for materializing and refining ideas.

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