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INTRODUCTION:

Originally, the term VE meant "Second Look VE". Recently, it has come to mean "First Look VE". Naturally, the methods used produce remarkably different results. First Look VE incorporates two value engineering approaches. One approach directs attention to the product planning stage. The other approach directs attention to the product designing stage.

VE in the designing stage is a method of value engineering which focuses on the function, quality, and exterior of the product already planned and decided upon. VE in the planning stage is a method of applying value engineering to the planning of function, quality, and exterior of product. In addition, value engineering in the planning stage investigates and evaluates the viability of the new planned product.

VE in the planning stage is more progressive than VE in the designing stage, but it has many intrinsic problems. We've, however, tried to practice this method in our own company for the past several years. In conclusion, we know we can get successful products by the development of product planning through VE.

BACKGROUND AND IDEAS OF THIS THEME

1. The tendency in B/W TV industries

In the Japanese household market as known, factory sales of B/W TV have been decreased by the popularization of color TV after 1963. Therefore, we can say that B/W TV is now a product which is in its declining stage from the viewpoint of its total life-cycle. (see Fig.1)

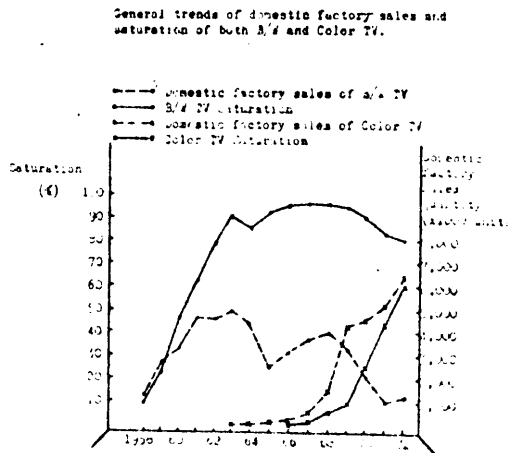


FIG. 1

Meanwhile in the export market, the main business is to the U.S.A. market. In the recent year, the Japanese export business to the U.S.A. has been decreased by the advance of Taiwan and Korean manufacturers.

Because of this tendency, the product concept of B/W TV has changed remarkably. Therefore it is necessary for us to be prepared and to plan for new, marketable products. For this reason, we have developed a philosophy which concentrates on the value and function of the product concept.

2. The difficulties encountered in the creation of worthwhile products.

It is a known fact that most manufacturers devote extensive time to product planning. But worthwhile products loved by consumers and purchased

created are as follows:

a) The characteristics of a man of ideas
Generally, the most typical man of ideas thinks that his work is to create his ideas for the theme asked, and not to examine them or to decide whether or not they are valuable for commercialization. Therefore many excellent ideas have been buried in dust.

b) The problems of the evaluation of the ideas
On the planning stage many people can create many ideas. For the man who evaluates these ideas, it is too troublesome to examine and evaluate them carefully because they are not his own ideas. Therefore, these ideas are evaluated superficially, and not in depth.

c) The problems of the investigation for the feasibility of these ideas
In the planning stage, the direction of the new product is decided mainly by the product planning section. But recently the life-cycle of the product has become short, so this section has not made the systematic effort or devoted the time necessary for an investigation of the feasibility of this product from the viewpoint of technology and artistic design.

Owing to these problems many excellent ideas have been buried in dust and remain far from commercial realization.

3. The effects of VE in the planning stage

The competition of cost reduction has become very violent not only in the B/W TV industry, but also in every industry. Since early times our company has applied the VE method to the designing stage, but it has become difficult to obtain the desired effect of VE because of many limited requirements in the designing stage. Finally, we must carry out the VE method in the planning stage in order to obtain the most effective VE.

Fig. 2 shows how much we can expect of the effect of VE if VE is applied in the planning stage. It also shows the connection between the reduction rate of cost and each stage of about 100 executed examples in our company. As shown in fig. 2, the reduction rate of cost in the designing stage is only 14% based on the producing stage, while in the planning stage it is exactly 46%. The difference between the two stages becomes 32%. Accordingly it can be seen that it is important to apply VE to the designing stage, but it's also very important to carry out VE through in the planning stage.

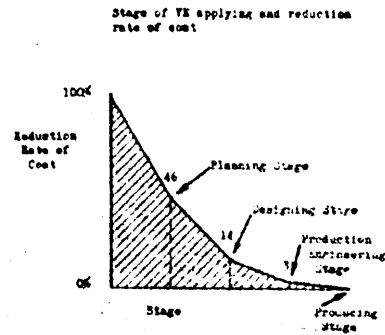


FIG. 2

THE DEVELOPMENT OF PRODUCT PLANNING THROUGH VE

What is product planning through VE? It is the analysis of the product concept, the proposal of new products, the policy decision, the embodiment of the policy, the evaluation of the commercializing plan, and the creating of the worthy product by applying VE to the stage just before the decision, and the action of the project team formed mainly by the designing section to the product planning stage.

Before we describe "Product Planning through VE", we, herein, explain how to plan the new product.

In usual product planning the product concept was analyzed at first by the planning section. They investigated the product concepts according to the information of the market tendency, the consumers' desire, the sales tendency, and the competitors' tendency. And then, the product planning section created the ideas for the kind of concept for the new product that would be best. And furthermore, in cooperation with the exterior design section, they planned the out-line of the new product's function, exterior, quality and other details. After making the dummy samples or sketches from this plan, the out-line of new product and the terms of planning purpose, sales area, objective consumers, market price, quantity of sales and marketing date were evaluated or decided upon in the planning conference. At this stage the new product planning was decided on in broad terms without earnest attention to the investigations of cost and technology.

This plan was then applied to the product design there the designing section concentrated on VE at the designing stage. The product's function, exterior and quality which were already decided upon in the planning stage were taken into consideration in the designing stage. But, it was so difficult to meet the target cost decided upon at the planning stage that it was seldom possible to get the profit expected.

The main problem with this method was that the designing of the new product decided on in the planning conference could not meet the target cost however hard we applied VE. Therefore, we had to change or improve the new product's function, exterior, and so on in order to meet the target cost.

As a solution for this problem, we worked out the method of VE application in the product planning stage. We hereinafter describe the new method with the executed case of 9 inches swivel B/W TV.

PHASE 1: The analysis of product concept
(responsibility of the planning section)

The data for analyzing the product concept are the same as they were, but the analysis of product concept should take into account the product's function and value thoroughly, and match them to the market at all times. These considerations are most important because of the changes in product concept for B/W TV caused by the popularization of color TV and the growth of the Taiwan and Korean manufacturing industry.

Now, there are two groups in the analysis of the product concept for B/W TV; pursuit types of utility value and fascination value. The former is further classified into pursuit types of basic function and basic function plus supplementary function. The latter is also classified into pursuit types of TV function plus supplementary function. Supplementary function refers to elements other than basic TV viewing; for example, usual shapes, sizes or colors. Each concept leads to TV for practical use, swivel TV, TV with radio, TV that does not look like TV and so on. (see Fig. 3)

The analysis of B/W TV concept

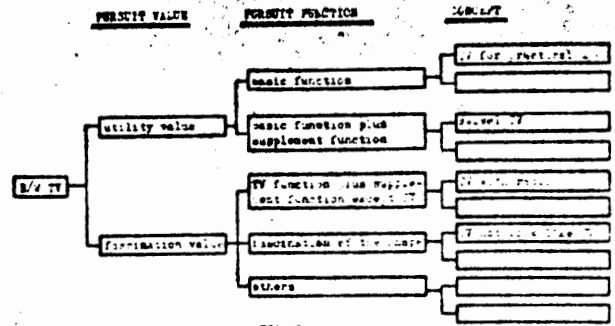


FIG. 3

PHASE 2: The ideas for the new product and the forming of policy (responsibility of the planning section)

With the analysis of product concept, the ideas for the new product begin to be presented. The procedure is as follows:

1. Decisions about the sales area and the objective consumers for the new product
2. Decisions about the classification for the product concept (TV for practical use or TV with radio and so on)
3. Decisions about the market price, the sales quantity and the marketing date.

These decisions form the policy of the new product. But it is even more important to form the abstract concept itself, for example; "TV for practical use" or "swivel TV". It is not necessary during this phase to decide on the function and exterior of the new product in detail.


PHASE 3: Decisions about the policy of the new product (responsibility of the planning conference)

If the policy of the new product is formed, the policy's validity is examined during the planning conference. The items to be examined are as follows;

1. Planning policy
2. Sales area
3. Objective consumers
4. Market price
5. Sales quantity
6. Marketing date

The planning conference decides the abstract policy.

The concept of the decision of the new product policy about "swivel TV" is described here. The term "swivel TV" means that the TV can be set in the preferred viewing position by moving it up and down, right and left freely.

DECISION OF THE POLICY FOR NEW PRODUCT	
*planning policy	: 9 inches swivel B/W TV
*sales area	: export mainly to U.S.A.
*objective consumers	: young generation and second use
*sales quantity	: _____ units/month, total _____ units
*sales price	: _____ Yen
*marketing date	: month: _____, year: _____
*incidental requirements	: the angle of swiveling over 10 degrees vertically  360 degrees horizontally
*supplement	: As swivel B/W TV made by other manufacturers is high cost, the market share is very small. We have to keep the target price whatever

This decision specifies the policy or the product's function for the new product, but the embodiment of the new product is not described yet. Because, if we do not apply VE to the decision making process for the embodiment, it produces the same VE effect as in the designing stage, and it then becomes impossible to achieve the greater VE effect and the new worthy product. We hereafter show that the project team is given much freedom in order to apply VE thoroughly to decision making concerning the embodiment of the new product.

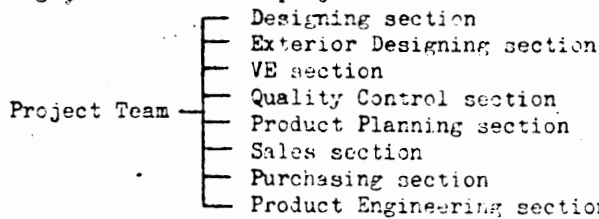
PHASE 4: The embodiment of policy (responsibility of the project team)

In this stage the project team is organized. They create ideas and investigate them through the product's function, exterior, production engineering, VE, cost and sales to embody the policy of the new product. They make up the real image of the new product. It is the main characteristic of this stage to use the project team organized mainly by the designing section.

We hereafter show the details.

1. Project team

Organization of the project team



It is important that the project team is formed mainly by members of the designing section. The reasons for this are as follows:

- The designing section is suited to investigate the presentation and embodiment of ideas.
- The designing section is much more familiar with VE method than any other section.
- The designing section can evaluate ideas actively and properly, (this reason is discussed further on).
- The designing section can enter into the real designing smoothly, after the embodying plan of ideas is approved.

2. Presentation and evaluation of ideas

Because the project team is given much freedom in the planning of policy, the ideas for the embodiment are presented to a very wide extent. As a result of that the project team creates many ideas through various methods. And also, various levels of ideas are created. But the most important key depends on whether they evaluate these ideas properly and make up the worthy product or not.

If the project team which has created ideas evaluates its ideas by itself, then it's surely possible to evaluate the ideas actively and properly.

The reasons for this are as follows:

- All members of the project team work positively. Because they are motivated by the fact that they are creating the new product themselves.
- The project team members will perform at the highest possible level in order to develop and realize their own ideas.
- Because the project team is formed mainly by the designing section, it can smoothly and properly evaluate the product's function, cost, feasibility.

What follows is an explanation of the reason why the policy of "swivel TV" lead to the idea of "Globe-shaped TV".

Generally, when improvement by the VE method

much more effective.

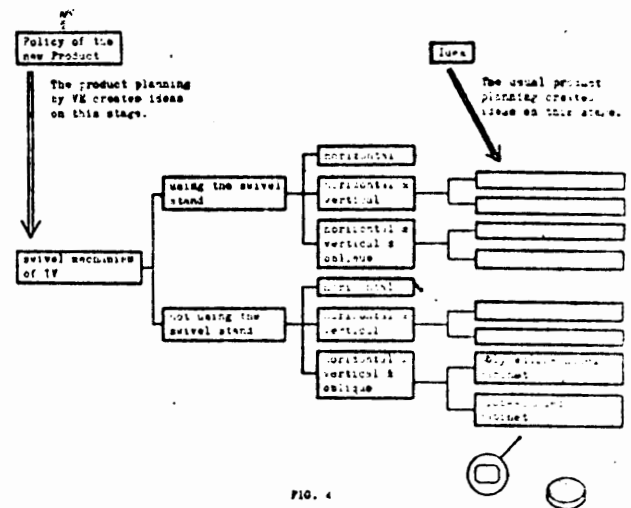
If the abstract theme of "Swivel TV" is developed by the method mentioned above in the new product planning by VE, it produces several ways to use the swivel stand. The swiveling motions are then combined to incorporate up and down, right and left, and oblique directions.

When the ideas are investigated by classifying as above, the conclusion results in the globe-shaped TV with the all directional revolving movement and without a swivel stand.

Consequently we could formulate the idea of "the globe-shaped and swivel TV" at last. Now we can say that the globe-shaped TV would never have been created if it had not been for the planning of the new product of "swivel TV equals the globe-shaped TV" in the usual product planning sessions.

Fig. 4 shows that great success is achieved when the new product policy is planned in abstract.

Creating process of swivel mechanism ideas



3. The embodiment of the idea

The project team must always investigate ideas for embodiment based on judgement as to whether or not they are proper for the new product policy. The conditions of the product's function, exterior, VE, cost, production engineering, sales and so on are checked mainly by the engineering section. The designing checks in this stage are just likely to commercialize the new product, and, therefore, there is a need to make the working sample. The reason for this is that the real sample is indispensable to the evaluation of the plan commercializing the new product in the next stage, as the product's image made up by this method becomes easily very unique from the viewpoint of the product's function and exterior.

The connection between the project team which embodies the idea, and the planning conference which confirms or modifies the commercializing plan should be very close. In addition, attention should be paid to the development of commercialization. Fig.5 shows this connection.

Connection between project team and planning conference.

decision of the new product policy (planning)	confirmation or modification for commercializing plan (planning conference)	evaluation & decision for commercializing plan (planning conference)	new product design (project team)

Fig. 6 shows the commercializing plan of the swivel B/W TV formulated by the project team.


COMMERCIALIZING PLAN of SWIVEL B/W TV	
Structure	globe-shaped TV. optional stand
Function	free tilting up and down, horizontal and oblique motions.
Cost	material cost — Yen. tooling cost — Yen. assembly cost — Yen.
Feasibility	quite possible by our technical.
Exterior Design	

FIG. 6

PHASE 5: The evaluation and decision for the commercializing plan of new product (responsibility of the planning conference)

The commercializing plan presented by the project team is drastically and repeatedly checked for the following conditions in the planning conference. (This conference decides upon the feasibility of actual commercialization.)

- a. Product's function and exterior
- b. Sales area
- c. Objective consumers
- d. Market price and profit
- e. Sales quantity
- f. Marketing date
- g. Dealers' opinion of the commercializing plan

At first half of members in the planning conference were opposed to the globe-shaped exterior for swivel TV. But when we showed the dummy sample to dealers in the U.S.A. and Europe, they admired this TV and they very much desired the product. Besides we knew that it would sell well even at a high market price because it's unique exterior and swivel function. So we proceeded to design it, confident of the commercializing.

PHASE 6: The designing of the new product (responsibility of the project team)

After the commercializing plan is approved by the planning conference, the designing section remains in the project team and other sections leave the team. The members of the designing section should be the same member who belonged to the previous project team. Otherwise the merit of this method would be reduced.

In this stage, the project team starts to design the new product. But the designing is very easy as the main designing has almost been completed in the planning stage. And also the VE method is used only in detail. It is, consequently, not so hard to keep the target cost.

What we mentioned above is the development of product planning by VE. Fig. 7 shows the process, of the usual product planning and product planning by VE as illustrated by a flow chart. Fig. 8 shows the steps, actions and executive section in product planning by VE.

the process of the product planning

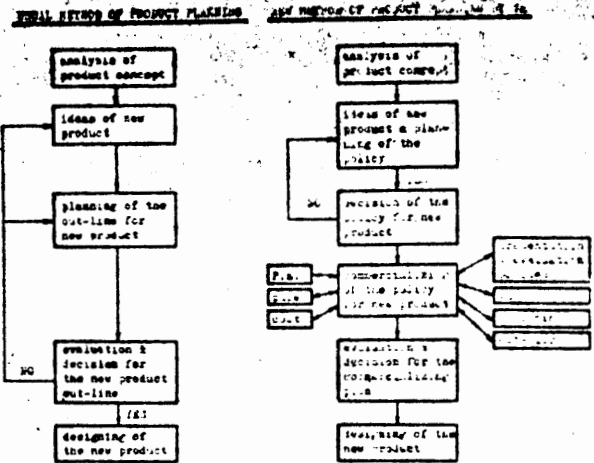


FIG. 7


THE DEVELOPMENT OF PRODUCT PLANNING BY VE		
STEP	ACTION	EXECUTIVE SECTION
analysis of product concept and ideas of new product	<ul style="list-style-type: none"> *market tendency *consumers' awareness *information of sales *competitors' tendency 	<ul style="list-style-type: none"> analysis of product concept & ideas of new product product planning section
decision of policy for new product	<ul style="list-style-type: none"> *planning policy *sales area *objective consumers *market price *sales quantity *marketing date *supplementary condition 	<ul style="list-style-type: none"> to investigate the propriety of related matters and to decide the policy planning conference
embodiment of policy	<ul style="list-style-type: none"> *presentation and evaluation of ideas *establishment of ideas and check *making-up the image of new product 	<ul style="list-style-type: none"> function exterior P.E. VE cost sales product team designing section planning section planning section quality control section
evaluation and decision for commercializing plan	<ul style="list-style-type: none"> *function, exterior *sales area *objective consumers *marketing price, profit *sales quantity *marketing date *dealers' opinions 	<ul style="list-style-type: none"> compare with the embodied product's image and the policy of new product and decide eyes or nose for commercializing planning conference
new product designing	<ul style="list-style-type: none"> *electrical design *mechanical design *quality and reliability P.E. VE 	<ul style="list-style-type: none"> product team designing section planning section planning section quality control section

FIG. 8


EXECUTED EXAMPLE

We have discussed the swivel B/W TV only, but, we, herewith, show the planning policy and conclusion reached concerning other executed examples for reference.

1. Utility B/W TV

PLANNING POLICY OF NEW PRODUCT	CONCLUSION (Domestic)
Policy : Utility TV Price : less than 20,000 Yen at the standard price (domestic) Sales Area : domestic and over-seas area Marketing Date : month _____ year _____ Supplementary : any C.R.T. size, but Conditions : not competitive with 12 inches market. Background : Consumers desire cheaper TV unless any trouble on the utility. At present time, the cheapest B/W TV is 12 inches tube-type TV and the price is around 20,000 Yen. (domestic)	standard price : 12,700 yen 9 inches B/W TV three different power source type only V.H.F. reception electronic tuner 

2. B/W TV that does not look like TV

PLANNING POLICY OF NEW PRODUCT	CONCLUSION
Policy : "B/W TV not look like TV" *combined with radio or clock Sales Area : export mainly to U.S.A. Objective : second-use, middle-class consumers Market Price : _____ Yen. Sales Quantity : _____ units/month total _____ units Marketing Date : month _____ year _____	7 inches B/W TV all-channel type combined with radio or clock 

CONCLUSION

While the product concept has been changing with time, the value also has been changing. In the stage of product planning we should catch this current, and then create the worthy new product. The value is presented by $V=F/C$, that is, the value goes up in relation to low production costs and high levels of function. But we should take sufficient care to be sure that the value meets the consumer's requirement. We have applied the VE method to the product planning stage as outlined in this presentation. Therefore, the new products which we described herein could meet the consumers' requirements and could be sold domestically and throughout the world with great success. We believe that even if B/W TV declines, we can create new worthy products of B/W TV which consumers desire heartily through the development of product planning applied VE. And also we are sure that it is possible to create more worthy products for consumers by making even greater improvement in our efficiency and method methodology.