INTRODUCTION

Originally, the term VE meant "Second Look VE". Recently, it has come to mean "First Look VE". Naturally, the methods used produced 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 design 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 designed 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 seven years. In conclusion, we know we can get successful products through VE by the development of product planning through VE.

BACKGROUND AND IDEAS OF THIS PAPER

1. The tendency in B/W TV industries

In the Japanese household market, B/W TV has been decreasing. 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)

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 are very few. Therefore, many excellent ideas have been buried in dust. This fact shows that a systematic study of VE is necessary for importance in the planning stage. In order to do this, the VE can be used in the planning stage to be carried out the VE method in the planning stage in order to obtain the most effective VE.

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.
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 consumer's desire, the sales tendency, and the competitor's 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 outline of the new product's function, exterior, quality and other details. After making the dummy samples or sketches from this plan, the outline of the new product and the terms of planning purpose, sales area, objective consumer, market price, quantity of sale 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 in 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 a 9 inch swivel B/W TV.

PHASE 1: The analysis of product concept

The analysis of the product concept was done as follows:

1. Market
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.
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 great 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 2: 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
   - Designing section
   - Exterior Designing section
   - VE section
   - Quality control section
   - Product Planning section
   - Sales section
   - Purchasing section
   - Product Engineering section

   It is important that the project team is formed mainly by members of the designing section. The reasons for this are as follows:
   a. The designing section is suited to investigate the presentation and embodiment of ideas.
   b. The designing section is more familiar with VE method than any other section.
   c. The designing section can evaluate ideas actively and properly, (this reason is discussed further on),
   d. The designing section can enter into the real designing smoothly, after the embodying 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 it's ideas by itself, then it's surely possible to evaluate the ideas actively and properly.
   The reasons for this are as follows:
   a. All members of the project team work positively.
   b. The project team members will perform at the highest possible level in order to develop and realize their own ideas.
   c. 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 in 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 is made, the team who is forming the company's product policy is given much freedom in order to embody the new product. In the case of "Swivel TV", the project team members were given much freedom to embody the new product. The swivel stand and the swivel 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 can 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" equaling 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 novel television ideas**

   ![Diagram](image)

   3. The embodiment of the idea

   The project team must always investigate ideas for embodiment based on judgment 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 design checks in this stage are just likely to commercialize the new product, and therefore, there is a need to make the working simple. The reason for this is that the real office is indispensable to the evaluation of the plan commercializing the new product. 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.

   **Connection between project team and planning conference**

   ![Diagram](image)
Fig. 6 shows the commercializing plan of the swivel B/W TV formulated by the project team.

**Commercializing Plan of Swivel B/W TV**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
<th>Cost</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globe-shapped</td>
<td>Free tilting, up and down, minimal size</td>
<td>Material cost</td>
<td>Quite possible, marketable</td>
</tr>
</tbody>
</table>

Exterior design:

**Phase 5:** The evaluation and decision for the commercializing plan of the 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 its 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.

**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

<table>
<thead>
<tr>
<th>POLICY OF NEW PRODUCT</th>
<th>CONCLUSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy: B/W TV</td>
<td>Standard TV</td>
</tr>
<tr>
<td>Price: less than 70,000 yen at standard price (domestic)</td>
<td>Three different power source type</td>
</tr>
<tr>
<td>Sales Area: domestic and overseas area</td>
<td>Only f.m. reception</td>
</tr>
<tr>
<td>Marketing Date: month: year</td>
<td>Electronic tuner</td>
</tr>
<tr>
<td>Supplementary: any C.B.T. size, but no single-size</td>
<td></td>
</tr>
<tr>
<td>Conditions: not competitive with 12-inch market.</td>
<td></td>
</tr>
<tr>
<td>Background:</td>
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<tr>
<td></td>
<td>Consumers desire compact TV</td>
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<tr>
<td></td>
<td>unless any trouble at the utility.</td>
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<tr>
<td></td>
<td>At present time, the cheapest B/W TV is 12-inch 1.L-4-type TV and the price is around 70,000 yen. (domestic)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>POLICY OF NEW PRODUCT</th>
<th>CONCLUSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy: B/W TV not look like TV</td>
<td>Standard B/W TV</td>
</tr>
<tr>
<td>combined with radio of close</td>
<td>All-enamelled type</td>
</tr>
<tr>
<td>Sales Area: export mainly to S.E.A.</td>
<td>Connecting with radio</td>
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<tr>
<td>Objective: second-class, single-class</td>
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<tr>
<td>Consumers:</td>
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</tr>
<tr>
<td>Marketing Date: month: year</td>
<td></td>
</tr>
</tbody>
</table>

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.