

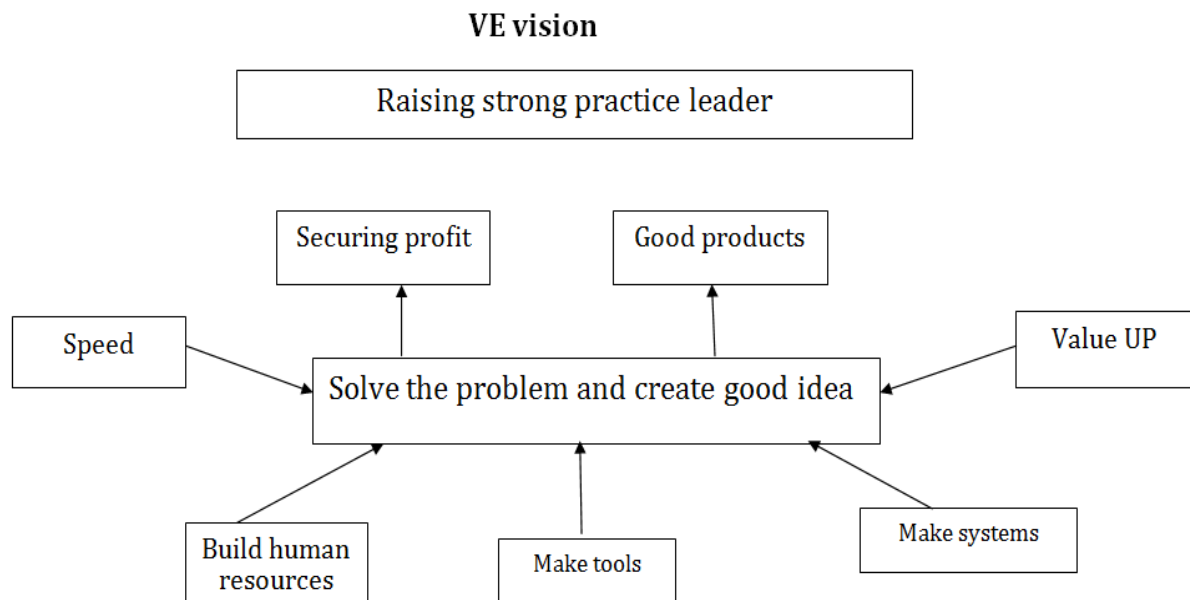
Value Engineering (VE) Activity

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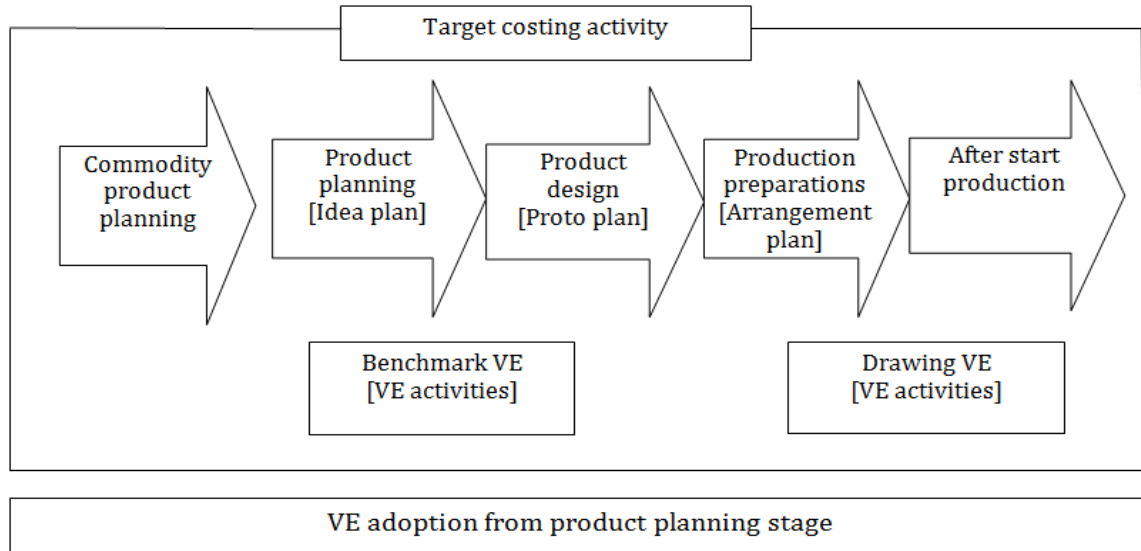
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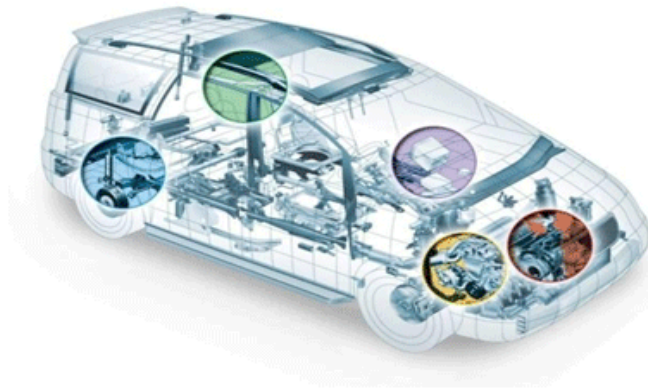
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Target costing activity and VE



Benchmark VE/ Drawing VE



| Benchmark VE/ Drawing VE | | |
|--|---|---------------------------|
| | Benchmark VE | Drawing VE |
| Application territory member | engineer | engineer |
| Application territory | Product planning To product design stage | After start production |
| A number of people | Two to five | Two to five |
| Cost impact | big | small |
| Out put | Function up/cost reduction | Cost reduction |
| The time required terms | 1 and half and two years | 30 minutes/1draw |
| characteristic | Compare relation function and parts | We reconfirm design grand |
| Benchmark VE | | |
| <p>Concept</p> <p>Bench mark VE</p> <p>It's clear relation of function and parts and compare with competitor</p> <p>And we analyze relation of function and parts we understand strong and weak points</p> <p>And we create good idea from competition</p> | | |

Benchmark VE

Making procedure

Step①

Think the top of function and express verb and noun

Step②

Think function of second or third

Step③

Arrange relation of purpose and method

Step④

Apply to parts toward each function

Step⑤



Divided competitor parts and apply to each function

Step⑥

We understand competitor strong and weak point and create good idea

Benchmark VE

Diagramming of function

| Function top level | Function first level | My company | Competitor A |
|---|---|-------------|--------------|
| Step1 | Step2 Step3 | Step4 | Step5 |
| Save record | Out ink | pole | pole |
| | | spring | spring |
|  |  | piece | piece |
| | | Piece soket | Piece soket |
| | | ball | ball |
| | Hook object | hook | hook |
| | | spring1 | |
| | Store components | Case 1 | Case 1 |
| | | Case 2 | Case 2 |
| ② add function Its finction UP | To prevent from slipping grip | grip | |
| | Erase word | Cape | |
| We create good idea by up chart | | | |



① Remove spring
nothing

② add function
Its finction UP

nothing

Benchmark VE

Diagramming of function

| Function top level | Function first level | My company | Competitor A |
|---|---|-------------|--------------|
| Step1 | Step2 Step3 | Step4 | Step5 |
| Save record | Outink | pole | pole |
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| | | spring1 | nothing |
| | Store components | Case 1 | Case 1 |
| | | Case 2 | Case 2 |
| ②add function Its function UP | To prevent from slipping grip | grip | nothing |
| | Erase word | Cape | |
| We create good idea by up chart | | | |

| Benchmark VE/ Drawing VE | | |
|---------------------------------|---|------------------------------|
| | Benchmark VE | Drawing VE |
| Application territory member | engineer | engineer |
| Application territory | Product planning To product design stage | Mass production |
| A number of people | Two to five | Two to five |
| Cost impact | big | small |
| Out put | Function up/cost reduction | Cost reduction |
| The time required terms | 1 and half and two years | 30 minutes/1draw |
| characteristic | Compare relation function and parts | We reconfirm design grand |

Drawing VE

Concept

Drawing VE is improvement method

During mass production

Step ①

We confirm examination main region

Example measure tolerance material thickness

Surface treatment

Step ②

We reconfirm design ground which measure tolerance material thickness

Surface tension

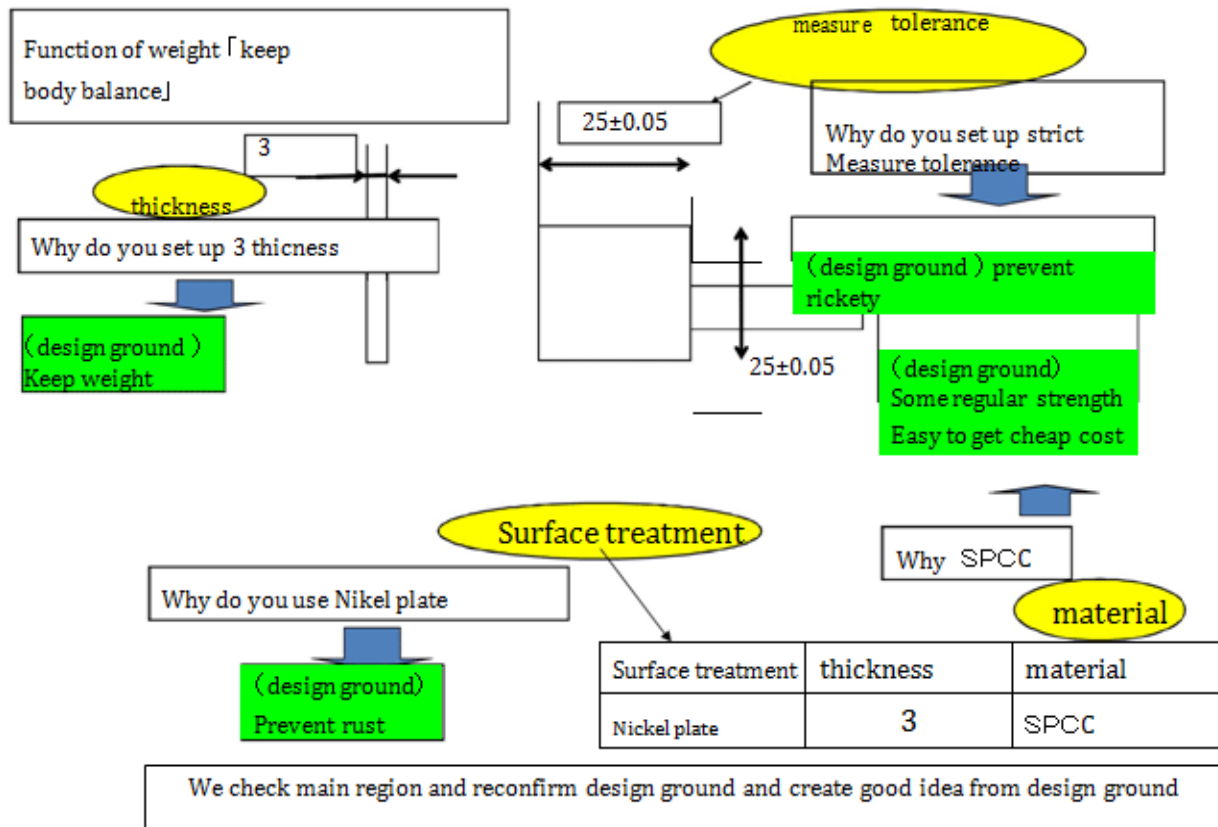
Like this question

Why do you select this material? Anything else?

Step ③

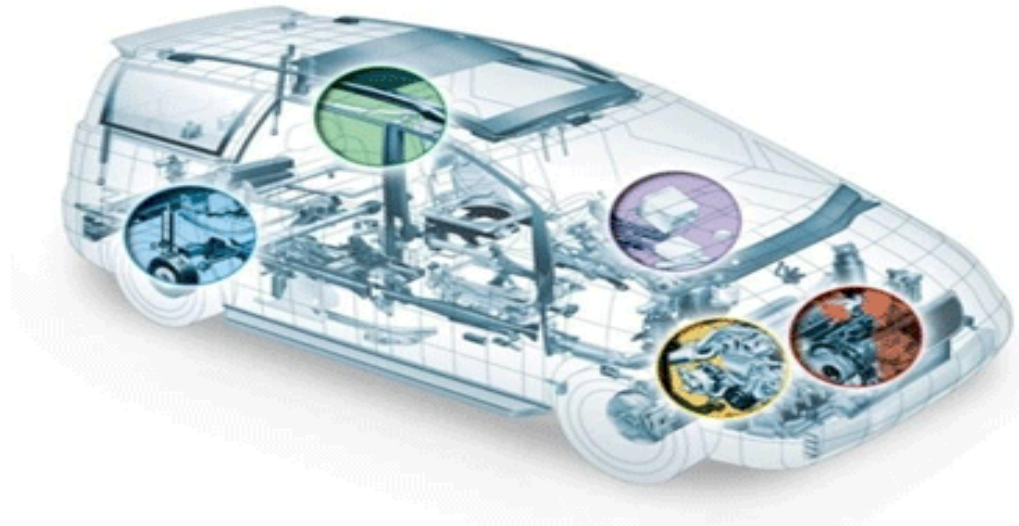
We create new idea from design ground

How to practice at drawing VE



Conclusion

VE is effective tools in Target cost activity



VE is Value engineering, it was born in 1947. Mr. Lawrence D. Miles discovered it in GE Company. In this time let you introduce Valueengineering technology management methods. First of all, I would like to explain about our target cost activity and VE activity. We will proceed 4 processes from product planning to mass production. At first lineup planning and product planning, next is development, and finally we will prepare for mass preparation, and finally we can proceed mass production. At this stage, we have 2 discussions. One is the bench mark VE meeting at product planning stage. The other is for drawing VA after we started production. The basic strategy for costing activity This shows the relations between costing and VE activity. Tge procedure of costing is lineup planning, product planning and after that product design. At this stage, we apply VE. The important point is to apply VE at planning stage. Because we can change the construction at this stage. Next step is production preparation. This is the activity to check up and adjust real cost. Drawing sheet is already fixed at that time, so we produce along to the specific. And finally, mass-produce. This sequential flow is called as target costing activity. The cost is decided What I would like to say from this chart is that the 80% of the cost is fixed in the stage of development planning That is why the early stage VE activity is important When the specification is fixed, big cost reduction is not easy. Let me introduce benchmark VE and drawing VE Introduction back ground About adoption of benchmark VE and drawing VE Here I would like to define 2 agendas, and consider solutions for them. At first benchmark VE. The problem is the difficulty to incubate new idea. As the solution, making it easy to incubate new idea by comparing competitors' function and construction. This is the bench mark VE. Bench mark VE and Drawing VE Here, checked again about scoop of members, scope of application, numbers of participants, cost impact, output required time, term and characteristic. What is bench mark VE? Scopes of members are designers. Scope of application is development planning stage. Numbers of members are two to five cost impact is big output is functional improvement or cost reduction Required time and terms are 1 and half to two years. The characteristic is to relate function and parts Parts and we create good idea to compare competitor From comparison with competitors, find out strong and weak points. And incubate new idea. I would like to introduce the procedure to make bench mark VE. At the first, making function diagram Step ① think the top function in this case express it with verb and noun Step ② think second and third function Step ③ arrange functions in a order from purpose to means Step ④ allocate parts for each function Step ⑤ desolve competitors' parts and apply for each function step ⑥, marshal strong and week point of competitors and us. And incubate new construction This is Bench mark VE and this is the chart which explains prepage. Simply speaking, top of function of ballpoint pen is save record For Save record, put out ink and hook object and retain components Prevent from slipping. They are the important functions. And for each functions, each parts are constructed. This relationship between function and parts is very important. Completion with competitors is mentioned from the relation between function and parts. For example Hook object. In our products, this function consists of hook and spring. But competitors' function is only coming from hook. For the function 'hook object', we found competitors apply only 1 part. Like this we think new structure from function Sometime we refer to competitor parts. Of course sometime some parts have different restriction condition.

And it is also possible to improve value by adding new function.

Everyone, Do you Know friction ballpoint?

This is the one we added 'erase' function on to the original function of ballpoint pen 'record'

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We can create new idea to apply this chart.

Original function diagram.

This chart shows a record of structure change in the development.

For example at first, 2016.12.1 the relation of function and parts is like this.

And Next time, for the function 'hook object', one part was reduced as the result of new idea consideration. This was a spring.

Like this, kept record of construction changes in development enable to track why the drawing is this construction.

And we can create good idea from design changing.

If your product has a lot of parts more than 100.

Try Subassembly.

What is drawing VE?

Member is designer and application scope is after prepare for manufacturing

A number of members are two to five cost impacts is small output is cost reduction.

The time required and terms is 30 minutes for one drawing.

By double-checking material, the role of tolerance direction on the drawing, incubate new idea.

Next page drawing VE its important method after mass production.

Why do I think this method is because we spent too long time even it was low effect, while we conduct full steps of VE.

Besides, daily improvement activity depends on experience and sense. So I introduce Drawing VE.

It shortens the time than VE full step to incubate advanced idea.

And its output is cost reduction.

But it's difficult to get big cost reduction.

Next, let me introduce concrete VE methods.

At first open the drawing on the table.

And check out main parts.

Material, dimension tolerance, thickness and surface finishing, they cost higher.

Recheck function of each parts, it means checking each role.

And find an angle which seems to incubate new idea. Finally, consider the new backup idea.

I would like to introduce case study

At first we confirm the function of parts the function of weight is keep body stable.

And next reconfirm material and dimension tolerance, thickness and surface treatment.

Let me start from material. Now it is SPCC (cold rolled steel plate in japan standard) or DC01 (EN).

Why it should be SPCC. Which function is really needed for materials?

We could find the reason is cheap and easy to bend.

We seem to find new idea.

Anything else?

And we thought hot rolled steel plate from design ground. This is new backup.

Next. Dimension tolerance.

Why is this ± 0.05 ?

We reconfirm designing back ground we found the reason is prevention of instability during settlement.

If it is really reason ± 0.1 is possible value.

Next thickness why should it be 3?

After checking designing back ground, the reason is to keep mass.

We can find solution to replace. Finally we can change from 3 to 1.

Last is surface treatment.

Currently, we use nickel plate. Why?

After check the reason, it is to prevent oxidizing.

And we can find solution from number 1.

Then galvanizing was coming up as a new idea.

We could find solutions like that.

As a conclusion, this method I introduced today, bench mark VE and drawing VE, is very useful.

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Tool for value improvement and cost reduction, from development stage to mass production.