Function Analysis and Modeling

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Practitioners of Value Management and Value Engineering have been using and teaching Function Analysis and Function Modeling for many years. Some people understand it immediately while others must struggle and practice to understand. In either case, when learned, the technique proves very powerful in understanding problem situations. You may find it necessary to work long and hard, but you will find it worth the effort.

The following mixture of text, examples, and workbook exercises is designed to prepare you to begin to use this technique effectively. Like bicycle riding, there is a great deal of difference between reading about and learning the technique. Many readers tend to skip over or read ahead in the exercises. Take the time to do each exercise correctly. If you do not wish to mark the book, keep a pad of paper with you to write on.

EXERCISE 1
Write your name as quickly as you can.
Write your name as quickly as you can, but leave out every other letter.
Which method was easiest?
Which method involved the least writing?
Did you just read ahead to here without doing the exercise?

This exercise has two points. First, most people reading a guide like this refuse to do the exercises and just read them over instead. However, since learning is an active experience, if you do not actually do the exercises, you can not expect to fully learn the techniques.

Second, most people find that printing every other letter is more difficult, even though they are actually doing half as much writing. The techniques in this manual will make you a better problem solver, and will eventually become as automatic as signing your name, but as you are learning a new concept it is difficult and frustrating at first. Take the time and energy to learn and practice these techniques and you will find them becoming very simple and useful.

THE FUNCTION CONCEPT

In order to use Function Analysis and Function Modeling, it is first necessary to understand what a function is. Basically, a function is what a thing does, not what it is, an effect the item has or can have on the world. Activities also have functions, and things and activities can have more than one function.

It is important that you be able to distinguish between things or activities and their functions. The following exercise is designed to begin building the concept.

EXERCISE 2

For each of the following pairs, circle the one which is a function or effect of the other.

A	B
1) paper clip	clip paper.
2) swat flies	flyswatter
3) automobile	transport people
4) desk lamp	illuminate surface
5) wash windows	remove dirt
6) assure timeliness	clock
7) write letters	inform friends
8) shelter family	build house
9) water plants	decorate home
10) mow lawn	decorate home

ANSWERS lb/2a/3b/4b/5b/6a/7b/8a/9b/10b

CREATIVITY

By now, most people are familiar with the Brainstorming technique developed by Alex Osborn. It has been found that the more ideas an individual or group develops, no matter how silly, the more good, creative solutions can be developed.

Brainstorming consists of listing as many different things as you can think of when trying to solve a problem. Osborn developed four rules to follow to increase the output of such an effort:

- Try for quantity -- quality will result.
- Defer judgment -- judging will come later.
- Free wheel -- silly ideas will spur great ones.
- Combine ideas whenever possible.

EXERCISE 3

1) For the following items, brainstorm a list of replacements.

coffee cup	paper and pencil

2) Brainstorm ways to perform each of the following functions.

transport liquid	record information

3) The functions in question 2 match the items in question 1. Which alternatives are more creative, those for the item or those for the functions?

FUNCTION CREATIVITY

The essential power of function analysis is that when we focus on what an item does instead of what it is, many more alternatives come to mind.

If I am concerned with the money I am spending on pencils, my alternatives might be: another supplier, shorter pencils, cheaper pencils, etc. But when I say that the function is to "mark paper," my alternatives expand drastically to include: wax pencils, crayons, pens, typing, computer printing, etc.

One of the more powerful creative techniques is to brainstorm on the function, ignoring the original problem. This enables us to search our memories for analogous solutions from which we can derive new solutions for our situation.

EXERCISE 4 Try this technique on a problem of your own
1) Name a thing or activity you would like to improve in the next few days.
2) List several functions that thing or activity might perform for you. What are the benefits you expect?
3) Choose one of the functions which seems to best state what you really want. For example, if your problem was a coffee cup, the function you really want might be to maintain alertness, or it might be you really want coffee and your problem is to transport coffee from a coffee pot to your mouth.
4) Brainstorm a list of things and activities which can perform the function you chose. Ignore the original problem. If you chose the function "transport liquid," include the Alaska pipeline, blood vessels, and railroad tank cars.
5) Select from the list an idea or two which seems to be useful. Are these ideas more creative than you might normally expect?

LISTING FUNCTIONS

Most activities or things have several different functions. We use an automobile for many different things. In addition, there are many other functions an automobile can be used for but usually is not, such as a paperweight or a garden tractor.

We often have to examine many of these functions to select appropriate targets for our efforts. It is important that we get into the habit of listing many functions for an object, and many different ways to say the function such as "toast bread", "heat bread", "warm substance", etc.

EXERCISE 5
1) List as many functions as you can which could be performed by a paper clip. BRAINSTORM!!
2) List as many functions as you can which a person might expect or want in an automobile. BRAINSTORM!!

EDITING FUNCTIONS

It has been found by practitioners that if you attempt to state each function with a single verb-noun combination, you are forced to more precisely understand the problem, and you are better prepared to be creative on the problem. The following rules have been evolved for stating functions. It is not always possible to meet all the rules, but you should try to achieve each of the following:

1. Use only a verb (action word) and a noun (the item that is affected by the verb), such as "support weight", "lift package", "transport people", or "rotate shaft".
2. The function should be verifiable, that is, you should be able to tell if it happens. "Increase happiness" is not as good as "increase smiles".
3. The noun should be measurable, at least countable. "Support weight" is better that "support shelf".
4. The verb should be as active as possible, and should affect the noun. "Communicate results" is not as good as "inform management" (you don't affect the results, but you do affect management). "Provide hardness" is not as good as "resist wear". NOTE: because PROVIDE does not affect its object it is rarely acceptable, and should be avoided if possible.
5. The verb and noun should not be too specific to the problem. "Transport liquid" opens up more possibilities than "transport coffee", "wash window" is not as good as "remove dirt" or "remove material".

It is important to note that attempting to edit functions as you brainstorm them will often shut down your thinking. First, list your ideas for the possible functions, then go back over them and edit them into a more advantageous format.

EXERCISE 6

For each of the following pairs of functions, choose the one which best fits the rules above.

	A	B
1)	provide cup	contain coffee
2)	contain coffee	contain liquid
3)	shelter family	shelter people
4)	glue paper	attach paper
5)	increase recreation	relax people
6)	fight war	incapacitate enemy

ANSWER lb/2b/3b/4b/5b/6b

EXERCISE 7

For practice in converting brainstormed functions into the proper form, go over the functions generated in EXERCISE 5 and restate the functions to better fit the rules.

USING THE FUNCTION CONCEPT

There are many ways to integrate the concept and techniques of Function Analysis into the Value Engineering process.

- During the Information phase, list as many functions as you can which must or should be performed by the solution, along with the other facts. This will expand the scope of your search for facts, give you a more realistic picture of the problem, and force group members to better define their facts in terms all can understand.
- During the Analytic or Function phase, use functions as the problem statements. This will more quickly give a high quality problem statement.
- During the Creative phase, ideate on the functions and ignore the problem itself to generate more ideas. When slowing down, ask the function of the function and ideate on that.
- In Evaluation, the function should be the prime criteria to determine if the idea should even be in the matrix. If the idea cannot possibly perform the basic function, it is not worth further consideration.
- In Implementation, try to state the plan of action in functional terms. This will keep the implementors more flexible in their thinking so that if a certain action will not work, they automatically try another which will also perform the function.

Using the concept of function and the techniques of Function Analysis can be a powerful supplement to the creative process. Observation of those most skilled at using the process shows that they already use the function concept unconsciously. Therefore, deliberate application can make you a better problem solver, and practice with the techniques should make you better still.

FUNCTION MODELING

The concept of function alone can be a powerful assist to solving problems. However, there are ways to organize the functions into patterns which give a much better grasp of complex situations, especially when used a a joint exercise for a problem solving group.

Lists of functions for items or activities can very quickly become unwieldy. The practitioners of Value Management have developed two different ways to divide up functions, which together can give us four different groups of functions, each of which can be treated differently.

The first split is between the functions the item can be used for and the functions the item does internally in order to perform its function. We call the functions an item can do PRIMARY functions and those which the thing does to do them the SECONDARY functions. In general, you really don't care if the secondary functions are performed, as long as the primary functions are. This is the same concept as "black-boxing" in systems analysis.

In the automobile example, some of the primary functions might be: transport people, transport luggage, facilitate vacation, increase leisure, etc. Some of the secondary functions might be: turn wheels, explode gasoline, generate electricity, etc.

EXERCISE 8

For each in the following list of functions of a typewriter, indicate if it is primary (P) or secondary (S).

1) type letters	5) support keys
2) hold paper	6) rotate ribbon
3) adjust spacing	7) apply ink
4) transmit keystroke	8) communicate thoughts

ANSWERS lp/2s/3s/4s/5s/6s/7p/8p

BASIC AND SUPPORTING

There is a similar but different division between BASIC and SUPPORTING functions. BASIC functions are those which we really need, while SECONDARY functions are those we would like or expect along with the basic functions. The basic function of an auto- mobile for one individual might be to "transport family". Supporting functions would include such things as "comfort passengers", "increase mileage", "protect passengers", and "impress neighbors".

EXERCISE 9

For each of the following primary functions of a bicycle, indicate which are, to you, basic (B) and which are supporting (S).

support passenger	resist punctures	carry passenger
resist corrosion	carry packages	resist splashing

A QUADRANT OF FUNCTIONS

The combination of these two ways of dividing enables us to divide the functions of anything into four groups. The first group, PRIMARY-BASIC, are the essential functions which must be performed by whatever solution you choose. The SECONDARY-BASIC are those functions which the item performs internally to perform the PRIMARY-BASIC. The PRIMARY-SUPPORTING are functions which the item or activity must do to be acceptable to the customer. A bicycle must transport passengers, this is a primary-basic, but it must also reduce shock through such means as a padded seat, pneumatic tires, etc. in order for a customer to buy it, making this a primary supporting function. SECONDARY-SUPPORTING functions are those done in order to perform the primary supporting, such as contain air in order to reduce shock.

EXERCISE 10

1) List as many functions as you can of a kitchen blender.

2) Divide the functions into the following four classifications. See if you can add more to each quadrant.

PRIMARY-BASIC	SECONDARY-BASIC
PRIMARY-SUPPORTING	SECONDARY-SUPPORTING

When solving a problem or trying to redesign an item or activity, create a function matrix such as this. Ideate on ways to perform the Primary-Basic, then on ways to perform the Primary-Supporting. All secondary functions can be replaced or even eliminated in the eventual solution.

RELATING FUNCTIONS

Dividing functions into the quadrants is a simple, rough technique which can give good results. But even within the quadrants, functions are often related in a primary/secondary way. We call the primary function of a pair the "higher order" function, and the secondary of the pair the "lower order" function.

For example, two primary-basic functions of a typewriter are to apply ink and to inform people. Inform people is why the typist applies ink and applying ink is part of how a typist informs people. Therefore, inform people is higher order than apply ink. In the same sense, two secondary-basic functions of an automobile are ignite gasoline and generate power. Generate power is the higher order of the two.

A good test for this relationship is that if you perform the higher order function "generate power" without "igniting gasoline" you would be satisfied. However, if you performed the lower order "ignite gasoline" without "generating power", you would not be satisfied.

This test holds true even if it seems that it would be impossible to perform the higher order without performing the lower order.

In the function quadrant we previously discussed, the primary functions would all be higher order than the secondary functions which perform them. However, it is also possible for functions to be unrelated, whenever one does not contribute to the performance of the other. For example, the function "contain air" in an automobile contributes to and is lower order than "comfort passengers", but it is unrelated to "generate power".

EXERCISE 11

For each of the following pairs of functions, circle the one which is higher order.

	ITEM	A	B
1)	coffee cup	deliver coffee	contain coffee
2)	projector	communicate ideas	project image
3)	pen	apply ink	make marks
4)	electric clock	move hands	display time
5)	vacuum cleaner	create vacuum	remove dirt
6)	wash windows	remove dirt	increase visibility
7)	flyswatter	swat flies	kill flies

ANSWERS la/2a/3b/4b/5b/6b/7b

LEVELS OF FUNCTIONS

Functions tend to each have one or more lower order functions and one or more higher order functions. Each of these functions also have other higher and lower order functions. This network leads to lower and lower order functions until an item or physical activity is reached which performs the lowest order function, which contributes to the higher order, and so on up to the highest order, as follows:

The function of flyswatters	might be to swat flies,
the function of swat flies	might be to kill flies,
the function of kill flies	might be to eliminate flies,
the function of eliminate flies	might be to reduce disease,
the function of reduce disease	might be to increase health,
the function of increase health	might be to extend life,
the function of extend life	might be to enjoy life,
the function of enjoy life	might be ...
	BECAUSE I WANT TO!!!!

Notice that in each case, if you could do the higher order function without doing the lower order functions, you would be satisfied.

This list of levels enables you to select the level of function appropriate to you current problem. If you see a fly, you may simply decide to "swat fly" and search for an object which could be used for this function such as a newspaper or magazine. If you tend to have this problem often, you might search for other techniques to kill flies such as poison or electrocution. As you proceed up the levels, the alternatives get more "way out", such as jogging to increase your health, using seat belts to extend your life, etc.

It is of course necessary to choose the appropriate level in the chain, the function which is the one you really want to perform. "In What Ways Might I swat flies" might be too limiting a problem statement because it eliminates sprays, traps, etc., but the question "In What Ways Might I enjoy life" is not going to give you a lot of ideas on how to keep flies from bothering you. The correct choice is probably somewhere between the two. You must pick the one that fits best.

EXERCISE 12

For each of the following items, determine their function, the function of that function, and so on as far as possible.

shoe string	brushing teeth

SYSTEMS OF COMPONENTS

The basic meaning of the term “analysis” is to take things apart into their component elements. This can be done in terms of pieces which can come apart, such as the pieces of a watch; in terms of sections a thing could be cut into, such as top, bottom, sides, surface, interior, etc.; or in terms of attributes such as color, material, shape, etc.

This gives an incredible number of component parts for any item. The systems analyst groups these components into systems, which can be put together into larger systems, until an overall whole is reached. The different ways these components and subsystems can be grouped can be called structures of the item.

Different analysts perceive different structures in the same items, depending on their background, experience, and goals. A tax collector might divide the nation's businesses into subgroups by amount of taxes paid or by percentage of problems in collections. A university placement office might divide the same companies by geographic location or by type of employee wanted.

A blender could be divided into the base, the pitcher, and the lid, or might instead be divided into the drive system (consisting of the motor, the impeller, and their connection), the containing system (consisting of the pitcher and the lid), and the base system (consisting of the part of the base which holds up the pitcher and positions the motor). Each analysis is of the same object, but the component parts are divided differently.

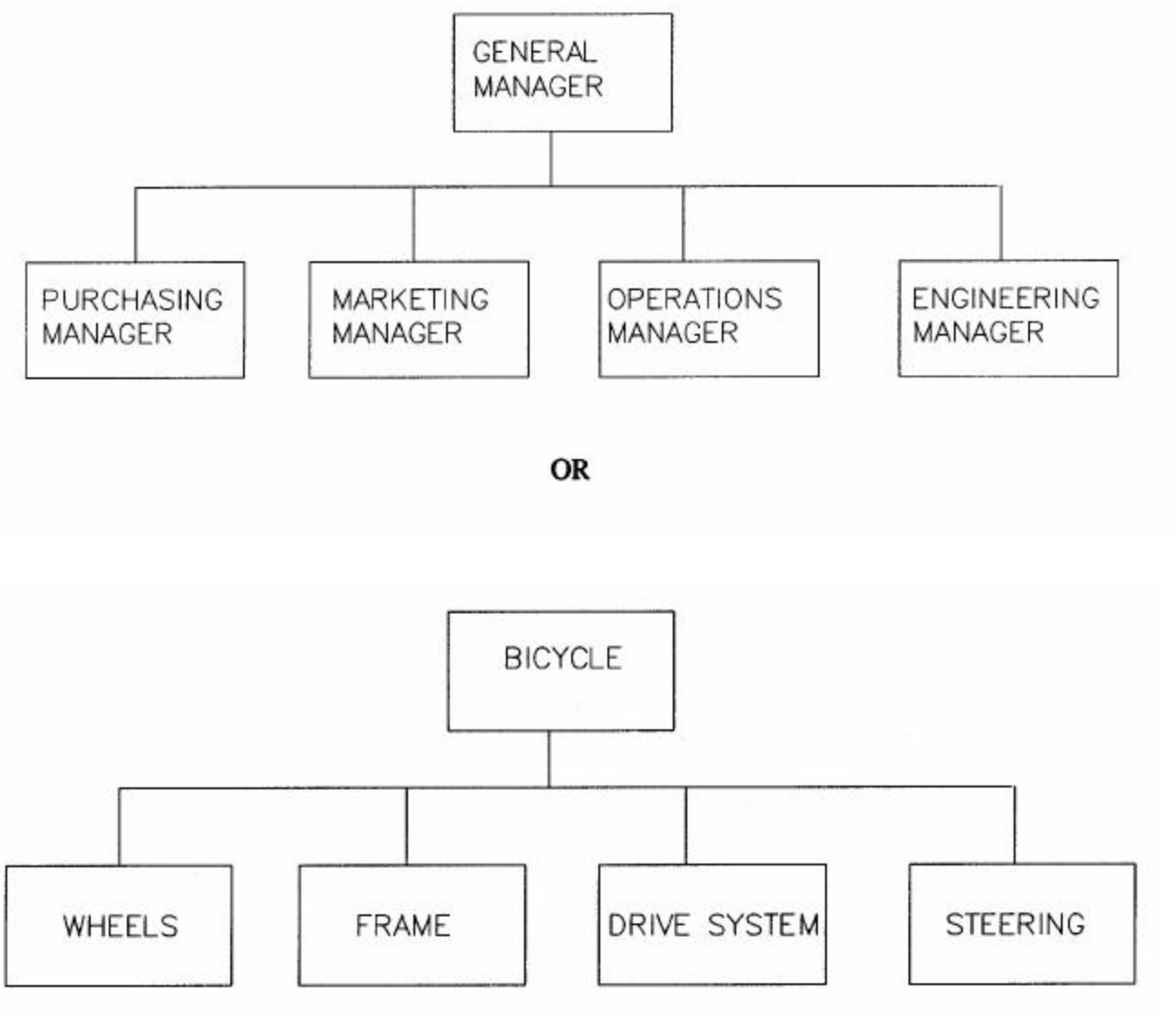
EXERCISE 13

For each of the following items, list two different sets of three to five subsystems. Just name the subsystems, you do not have to list the elements of the subsystems.

Automobile -- Breakout One	Electric Desk Lamp -- Breakout One
Automobile -- Breakout Two	Electric Desk Lamp -- Breakout Two

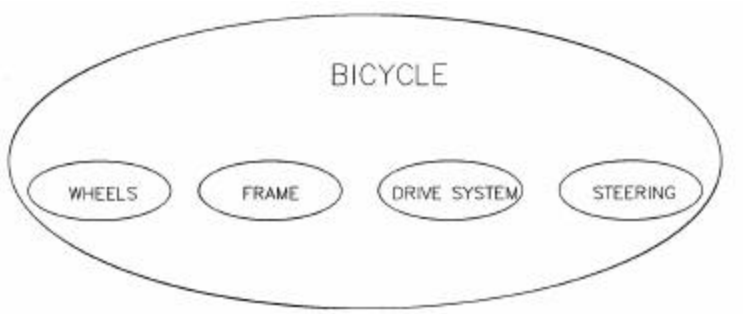
REPRESENTING SYSTEMS

In general, people seem to comprehend systems better if they can look at a picture or some kind of graphical representation. A simple listing of elements is a good start, but there are many other ways to describe a system. The most common graphic representation is the hierarchy chart:

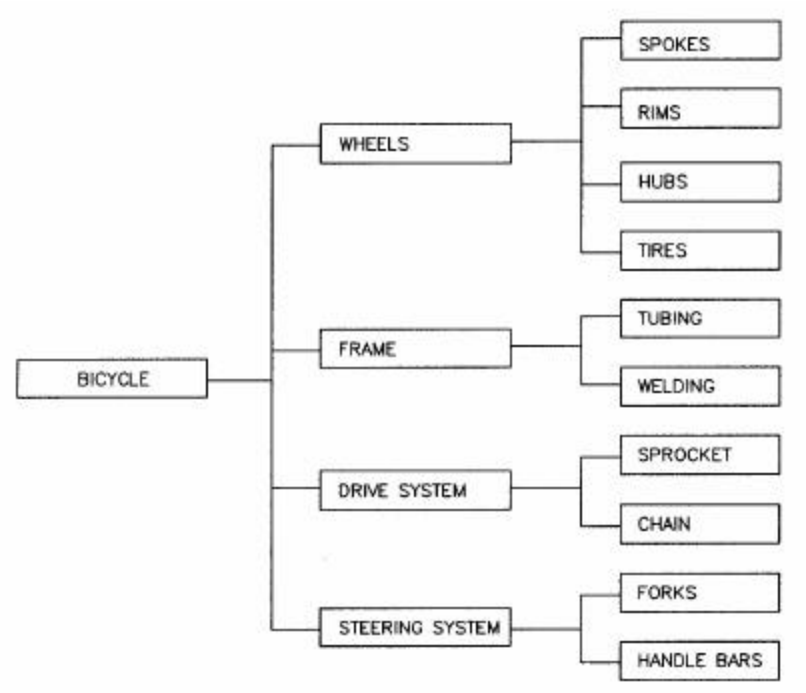


Actually, the bicycle is not a hierarchy. The first chart does show that the marketing manager works for the purchasing manager, but the wheels are not bossed by the bicycle. Instead the components make up the higher named item. This kind of relationship is called a holonomy. The components listed are each holons which add together to be the bicycle, which is another holon and could be part of a larger holon, such as transportation system. The word holon is based on the Greek vocabulary and grammar to indicate that it is both a part and a whole. One good way to represent a holonomy is as follows:

Not only does this show that the parts go together to make up the whole, it also gives us room to draw the relationships between the components. Since a system really consists of its components and the relationships between them, this is often a good method.



Unfortunately, boxes within boxes do not let us see the holons within holons for more than two or three levels without using a very large piece of paper. Since this ability to look at multiple levels is very important in Function Modeling, we will use the hierarchy form, laid on its side. Remember, though that it is a holonomy, not a hierarchy. The leftmost box is made up of those elements joined to its right side.



EXERCISE 14
Choose an activity or item which you are familiar with or can observe. Construct a holonomy chart of its components, going to at least three levels as above.

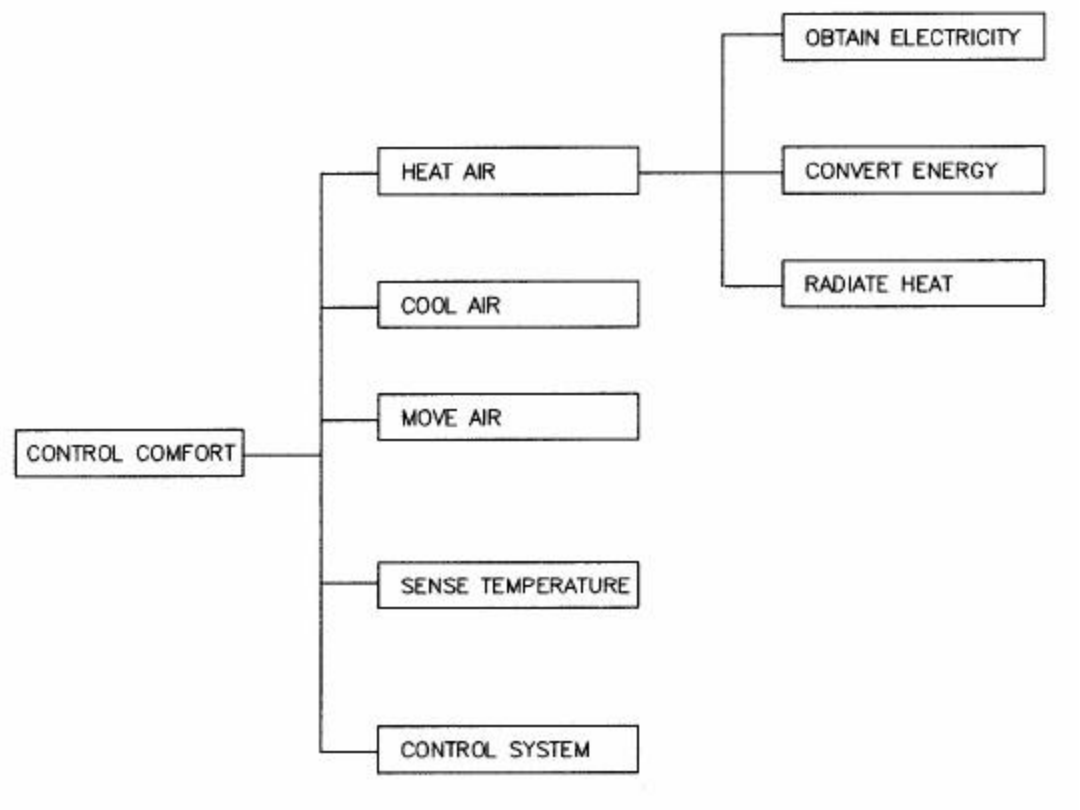
SYSTEMS OF FUNCTIONS

Now we will combine the systems concept with the function concept. In this case, the components of the system will be other functions until, at the lowest level, we reach objects and activities which perform the functions.

In general, there are several ways to perform any function. Each of these ways can be represented as a set of lower order functions which work together to perform the higher order one. Of course, each of these lower order functions can be performed in several different ways, each of which can also be described as a set of even lower order functions.

For example, we could heat air for a room with a radiant electric system. This could be described as: "obtain electricity", "convert energy", and "radiate heat". On the other hand, we could perform the "heat air" function with a hot water system which could be described with such functions as: "heat water", "move water", "transfer heat", etc. Again, each of these functions can be described as a set of even lower order functions.

We can build models of an existing system in great detail as follows:



We can use this detailed model of a building's air conditioning system to guide our creative efforts to improve it. We can brainstorm on each function in the whole picture to find better ways at each level. This keeps the group focused on the true nature of the problem while forcing them to expand their vision to the limits of the study. Often a team becomes bogged down trying to improve a bolt and forgetting there are better ways to do the overall task, ways that are within the scope of the study.

EXERCISE 15
Select an item or activity you are familiar with and interested in. List as many functions as possible, then build a function model as above. Use the model to guide creativity sessions for yourself or a group. Try to observe what difference it makes to have the model for a map.

FOCUSING CREATIVE EFFORT

The function model is an excellent tool for improving the understanding of a product, service, or problem. An individual or group which develops a function model, then focuses creativity on each function in the model will do a more thorough and more creative analysis than others.

When attempting to design a whole new solution, it is important to construct a very complete model and to be thoroughly creative on each piece. However, in many cases, thorough examination of every piece is not advisable. This is because cost and other critical criteria are not evenly distributed among the components of a problem.

Vilfredo Pareto was an Italian economist researching the distribution of wealth in rich and poor countries. He found that no matter what the per capita income, about 20% of the people owned 80% of the wealth, while the other 80% of the people owned the remaining 20% of the wealth.

Later this "Pareto's Law" was applied to business inventories. It was found that about 20% of the products made up 80% of the inventory, while the other 80% of the products were represented by only 20% of the inventory.

While the percentages may vary, the "60-40 Law", the "70-30 Law", or the "80-20 Law" has been found to apply to almost everything. In 20% of your working time, you achieve 80% of your results; 80% of your grocery bill is made up of 20% of your purchases.

In the same way, 80% of the product cost is in 20% of the components, 80% of your customer complaints are about 20% of your products, etc.

The advantage of this "law" is that if you can locate the critical 20% of a problem, you can focus on just that and affect 80% of the whole problem. In most cases, since we have many different areas to work on, after we have dealt with the critical 20% of one area, much more can be accomplished by attacking the critical 20% of a new area than working on the remaining 80% of the first area.

Often by constructing a model of functions or components, allocating costs to each element, and examining the model one can quickly select the critical 20% to work one. In other cases, if the team is especially knowledgeable of the area, it is not even necessary to allocate costs -the team members know the critical areas. Be careful, however, because people are often wrong in their perception, and the model can really be a surprise.

BUILDING A FUNCTION MODEL

The following steps are one way to build a function model of a thing or an activity:

PHASE ONE: LIST FUNCTIONS

STEP ONE: BRAINSTORM FUNCTIONS

List as many functions as possible. Deliberately focus on: functions of the whole item functions it is normally used for functions it is occasionally used for functions it shouldn't perform, but does higher order functions of each of these functions of components of the thing functions of attributes such as color, shape, etc. Do not worry if inappropriate answers pop up. Write them down to keep your head going, and think of ways in which they might be functions or be changed to functions.

STEP TWO: SELECT FUNCTIONS

Cross out functions which are truly irrelevant Locate duplicates and select the best statements Eliminate those which are too high order to be relevant.

STEP THREE: EDIT FUNCTIONS

Look at every selected function and change words which are specific to the problem and might limit creativity. Eliminate or replace functions which cannot be measured or verified in some way. Try to develop combinations in which the verb is done to the noun. You don't provide hardness, you harden material.

PHASE TWO: ORGANIZE FUNCTIONS

STEP ONE: CHOOSE HIGH-ORDER

From the edited functions, choose the ones which are highest order, the ones which, if you could perform them by magic, you would be satisfied. Try eliminating each to see if you would still be satisfied, until you have the smallest number of functions. This set of functions is also known as the task.

STEP TWO: POSITION FUNCTIONS

List each of the selected, edited functions on some kind of moveable media such as index cards or adhesive paper. Place the selected high order functions to the left on a work surface such as a wall, a table, or the floor. Begin placing the rest of the functions on the work surface to the right of the task functions, placing them to the right of those which seem to be higher order to them. Manipulate the arrangement, adding other functions as necessary.

PHASE THREE: TEST DIAGRAM

STEP ONE: CHECK WHY'S

Starting with the rightmost functions, check to see if the function to the immediate left is the reason why the function is done. Continue until you reach the task functions which are there because the customer wants them.

STEP TWO: CHECK HOW'S

Starting with the leftmost functions, check to see if the functions immediately to the right of each function is part of how the function is performed.

STEP THREE: CHECK COMPLETENESS

Again starting with the leftmost functions, check to see whether if each of the functions immediately to the right is performed, the higher order function will be performed. One at a time, try removing lower order functions to see if the remaining functions would be enough to perform the higher order. This process is only roughly sequential. As you progress further, you will find that functions are missing and must be added or the testing phase may show that the organization must be changed, or even that a new function must be added. Repeat the process until the model passes the testing phase. It is especially good to give yourself some incubation time in the middle of this process, to give your brain's pattern processing capacity a time to mull over the model and develop some new patterns. With practice, you will find that these models almost spring up fully developed in the mind, although the first ten or twenty will definitely be very tedious and frustrating.

SUMMARY

A function model can be used in various ways throughout the Value Engineering process. During the Information phase the model is constructed as a way to organize the available facts and constraints and as a way to discover missing parts of the problem. Then in the Analytic (Function) phase, it should be a simple matter to pick out a few key problems to work on. In the Creative phase, when creativity lags, go back to the model and choose a higher order function to explore, or look at the lower order for opportunities. In the Evaluation phase, look to the higher order functions for criteria for judgment. If an idea fulfills the target function, but does not provide the higher-order function (such as exploding gasoline without generating power in an automobile) it should be rejected. With practice, this technique will become a common part of your vocabulary. Practitioners of Value Management have noticed that their families and friends have learned to cringe every time the word function is used, because the concepts and techniques do seem to apply to about every situation and a Value Specialist seems to use the word function about every tenth word. But the power of the technique is such that soon families and friends are using it too, because it works. And so the concept spreads.

ALLOCATING COSTS TO FUNCTIONS

Allocating the various elements of the structured cost estimate to the structure of the function model allows the team to see which function components could benefit most from insight and creativity. Costs can be allocated to the lowest level blocks in the function model as shown below. When the costs of lower level blocks are added together to give the cost of higher level blocks, and again until all blocks are costed, the cost in the highest level box should equal the total cost of the project.

Single Function Cost Elements

In every VE project, many of the cost elements of the estimate have a single function. In these cases, the entire cost of such elements is allocated to that function.

Single Function Attributes

Among the multiple function elements, many of them have attributes which can be allocated. For example, in a road system, some of the roadway can be allocated to operational access, while other is only for maintenance access. Some floors of a building can be allocated to maintenance while others are allocated to housing equipment for maintaining the environment.

Multiple Function Attributes

The toughest to allocate are cost elements which perform multiple functions. For example, if a function model has "restrict access" and "welcome visitors" as functions, a reception area would need to be allocated to both areas. First of all, any cost which can be allocated to either area should be. For example, extra square footage added only for "welcoming visitors" should be allocated to that function. After doing this, certain costs will be left which truly are for both functions. In our example, the minimum square footage which would be there for either function can be allocated in one of two ways:

1. Allocate all of the cost to the function which is considered most important.
2. Split the cost evenly among the functions.

Which method is chosen is not critical, but arguments between the two positions can go on forever, to little benefit. It is best to choose one and use it.

Overlapping Cost Areas

Function models often create interesting classification problems. For example consider a model of a roadway with the functions "carry traffic," "resist breakage," and "assure convenience". It could be decided that a road one half of the planned width could carry the traffic in a one-way loop. It might also be found that one third of the cost is for the additional cost of concrete over asphalt, providing more resistance to breaking. Thus the bare minimum for "carry traffic" would be a half-width asphalt road, at a cost of 2/3 of 1/2 of the original cost. If you allocate half of the cost of the road to "assure convenience" (it is more convenient to have two way traffic) and one third to "resist breakage" for the extra cost of concrete, you have allocated more than the total cost of the road. This happens because the cost of concrete on the second half of the road has been allocated to two different functions. This case should be handled by the same rules as above with multiple function attributes.