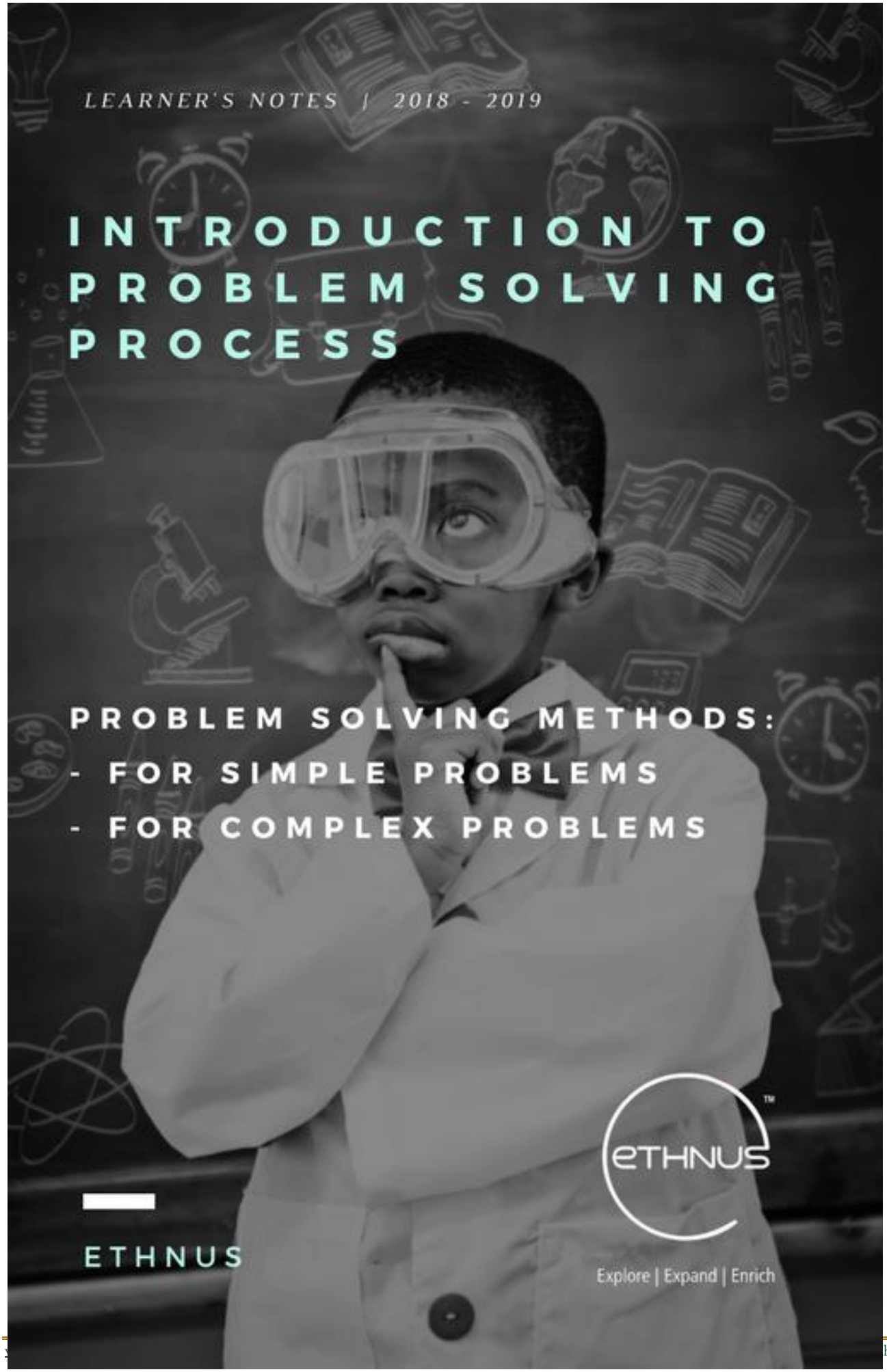
LEARNER'S NOTES | 2018 - 2019
INTRODUCTION TO PROBLEM SOLVING PROCESS
PROBLEM SOLVING METHODS:
- FOR SIMPLE PROBLEMS
- FOR COMPLEX PROBLEMS
ETHNUS
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INTRODUCTION TO PROBLEM SOLVING PROCESS

PROBLEM SOLVING METHODS FOR SIMPLE PROBLEMS
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INTRODUCTION

What purpose do we use our thinking skills for? We use our thinking skills mostly in the situations of crisis. Everyone in this world face problems every now and then. Thinking happens automatically at the time of problematic situations. All of us get this feeling that how wonderful it would be if we could solve a problem at hand preferably without much difficulty or even with some difficulties. Hence, while thinking about the solution to a problem. One must explore and brainstorm in all possible avenues to reach a solution one by one until one comes across a right path to a solution.

Problem solving becomes an extremely important step in career building. The better you are at problem solving, the more you can achieve in your career. This will lead you to get better and better opportunities which indeed helps in career growth.

Thus casually speaking, there is guessing and hence an element of luck involved in problem solving. However, in general, as one gains experience in solving problems, one develops

QUOTES

"In order to be an effective problem solver, a person has to have the ability to use prior problem solving skills on problems in the existing future."

-Ormrod

one's own techniques and strategies, though they are often intangible. Thus the guessing is not an arbitrary guessing but an educated one.

Problem solving has a great impact on the thinking flow of an individual. This area promotes the analytical and critical thinking. Learning tactics and techniques of Problem solving will definitely be helpful in taking wise decisions at difficult situations in a professional workplace. Here we are going to learn a framework for problem solving and get a glimpse of strategies that are often used by experts.

SIMPLE PROBLEMS VS COMPLEX PROBELMS

Problems are generally categorised into two categories. They are- Simple problems and Complex problems. Simple problems are comparatively easy to attain a solution. But complex problems requires some extra efforts to obtain the solution. Simple problems can be solved by having a generic approach. Most of the simple problems are solved by using the prior experiences. Hence, simple problems does not take much effort. Complex problems requires constant brainstorming and rigorous thinking to get the right solution. There are methods and techniques to solve problems. A planned and designed approach will help one to reach the solution in the best possible way. Some of the methods work well for simple problems and some methods are meant for complex problems. The problem solving tools will be always helpful. Let us look at the each one of them in detail in the next sections.

PROBLEM SOLVING METHODS FOR SIMPLE PROBLEMS

PROBLEM – WHAT IS IT?

IMPORTANT

We use the word problem to describe a wide range of situations of different importance, from the irritation of discovering that the car battery is flat, to the life threatening failure of an aircraft engine in mid-air.

Problems can be defined broadly as situations in which we experience uncertainty or difficulty in achieving what we want to achieve.

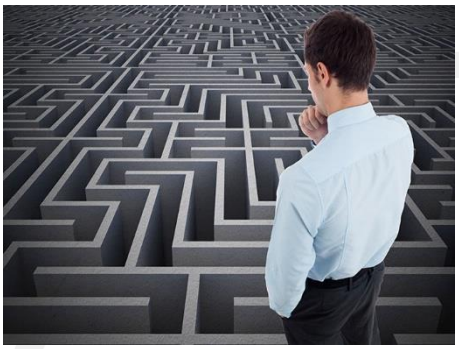
Problems arise when an obstacle prevents us reaching an objective, e.g. when a breakdown in

a company's manufacturing plant (the obstacle) prevents it fulfilling orders (the objective).

Objective: Something we have decided we need to achieve.

Obstacle: Anything that prevents us achieving an objective.

Objective + Obstacle = PROBLEM



Problems can be divided broadly into two groups:

1. Closed Problems

Those where the current situation is not what was expected (known as closed or **maintenance problems**)

Closed problems occur when something has happened that should not have happened, or something we expected to happen has not happened, i.e. there is a deviation from the normal or expected state of affairs.

For example, it could be the unexpected resignation of a key member of staff, or the failure of the principal speaker to arrive at a conference. The cause (or obstacle) may be known or unknown, but something needs to be done about it.

2. Open Problems

Those where we want to change our current situation in some way but there is an obstacle

preventing us doing so (known as open-ended or **achievement problems**).

Open-ended problems occur when we want to achieve a specific objective but there are certain obstacles blocking our progress. They can be subdivided into three groups:

- Where we are unable to reach our current objective, e.g. failing to meet a sales target
- Where our current objective could be exceeded, e.g. improved efficiency
- Where a new objective could be achieved through problem solving, e.g. creating a new product or service.

Although each problem is unique in terms of the information involved, and requires a unique blend of thought processes to find a solution, all successful problem solving follows a basic pattern.

REWARDS OF FACING PROBLEMS

We usually define a problem fairly negatively: **a problem is a hassle, it's a pain in the neck**. This is often true, but more generally, a problem can be considered the difference between what is, and what might or should be. And believe it or not, problems have their advantages, too. What are some of the good things about problems?

- **Most problems are solvable** (or partially solvable, or at least improvable). We can do something about them. The task may seem overwhelming (it surely did when David fought Goliath, or when suffragettes worked to give women the right to vote), but it's not hopeless. Our optimistic assumption is that we can change the world.

- **Problems are opportunities to make some good things happen**. If it weren't for problems, what would be our motivation to create change?

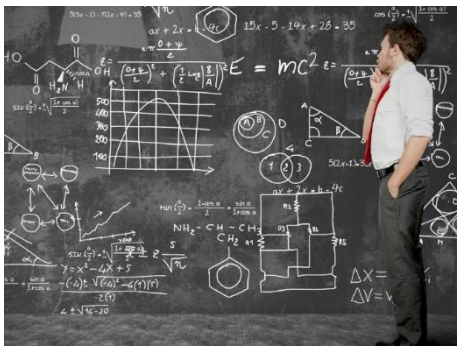
- **Problems are also challenges**. They call upon the best of our abilities, and ask us to go beyond what we thought we could do. They make life interesting, and, at least sometimes, fun. Without problems, life could be pretty boring.

Understanding the process of problem solving will be helpful in resolving the problems irrespective of their complexities.

PROBLEM SOLVING PROCESS

The art of achieving an objective by resolving the obstacle that interrupt the process of attaining the objective. In other words, an art of solving a problem.

It can be defined as, "an individual or collaborative process composed of two different skills: **(1)** to analyse a situation accurately, and **(2)** to make a good decision based on that analysis."



Like any other process, there are many different tasks that need to be done to properly solve problems. And again, like any other process, skipping some of the steps will make the job more difficult in the long run. Hence, problem solving must be handled in an effective way. Sometimes one silly mistake may make the efforts futile. While solving any sort of problem one must be very careful in terms of mistakes that may happen. Anticipating the obstacles is one of the ways to carry the resolution process flawlessly.

ADVANTAGES OF PROBLEM SOLVING

There are many problems throughout the world, some that are very simplistic while others are very complicated with many details. Here are some advantages of problem solving:

- Problem solving improves critical thinking.
- Allows one to do something out of the box.
- Helps in cultivating leadership attributes.
- Increases the confidence level of an individual.
- Helps in accurate and wise decision making.
- Makes an individual more and more controlled towards facing and resolving complex problems.

Problem solving is an art. The more we volunteer to solve problems, the wiser we become at resolving and identifying problems. As it promotes critical thinking, analytical capacity of an individual gradually increases and attains perfection over a period of time.

IMPORTANCE OF PROBLEM SOLVING

IMPORTANT

Problem-solving is important both to individuals and organizations because it enables us to exert control over our environment. Some of the importance of the problem solving are given below.

- **Fixing things that are broken:**

Problem-solving gives us a mechanism for identifying these things, figuring out why they are broken and determining a course of action to fix them.

- **Addressing risk:**

Problem-solving can be applied to the anticipated future events and used to enable action in the present to influence the likelihood of the event occurring and/or alter the impact if the event does occur.

- **Improving performance:**

Problem-solving helps us understand relationships and implement the changes and improvements needed to compete and survive in a continually changing environment.

- **Seizing opportunity:**

Problem-solving enables us to identify and exploit opportunities in the environment and exert (some level of) control over the future.

These ar

OBSTACLES IN PROBLEM SOLVING

There are several things that may become obstacle in solving problems.

1. **Inappropriate use of ideas**.

While incorporating the idea most of the people often do not explain the reasoning behind the usage nor the way to reapply the process to other problems in different ways. This often leads to inappropriate way of handling situations. Which indeed leads to delay in problem resolution.

2. **Blocks**. People often develop "blocks" that make it difficult to develop a solution to the problem.
Examples include:

- **Perceptual**

How people interpret what they see in the world, which often renders decision making biased.

- **Emotional**

When a person's emotional needs take precedence over the problems at hand.

- **Intellectual**

Not being able to think through the processes required for a particular problem.

- **Expressive**

The problem solver not having the ability to communicate well enough to produce an effective solution.

- **Environmental**

Anything external (social or physical) that gets in the way of the problem solving procedure.

- **Cultural**

The inability to veer from the "norm".

These are a few obstacles of problem solving. Hence, one must look for the ways to avoid these obstacles. It depends on the individual capacity to analyse. Overcoming these hurdles will enhance the thinking capacity. Knowing the proper way to execute the ideas is very important. Proper application of idea leads to an accurate solution. Therefore understating the framework and steps of problem solving is very crucial.

STAGES IN PROBLEM SOLVING

IMPORTANT

The problem solving process can be divided in different ways and the stages have been given various labels. This has been done to make it easier to understand but how it is divided and the labels that are used are not important. To be a successful problem solver you need to understand what the stages involve and follow them methodically whenever you encounter a problem. To solve any problem the frame work is very important. The following four phases can be identified in the process of solving problems:

1. recognising and defining the problem
2. finding possible solutions
3. choosing the best solution
4. implementing the solution

I. Recognising and defining the problem

Obviously, before any action can be taken to solve a problem, you need to recognise that a problem exists. A surprising number of problems go unnoticed or are only recognised when the situation becomes serious. Opportunities are also missed. The problem definition provides the basis for finding solutions.

II. Finding possible solutions

Finding solutions involves analysing the problem to ensure that you fully understand it and then constructing courses of action which will achieve your objective. Analysis also helps you to decide what the ideal solution would be, which helps to guide your search for solutions.

Constructing courses of action to solve the problem involves discovering what actions will deal with any obstacles and achieve your objective. Workable solutions are developed by combining and modifying ideas and a range of creative techniques are available to help in this process. The more ideas you have to work with, the better your chances of finding an effective solution.

III. Choosing the best solution

This is the stage at which you evaluate the possible solutions and select that which will be most effective in solving the problem. It's a process of decision making based on a comparison of the potential outcome of alternative solutions. This involves:

- identifying all the features of an ideal solution, including the constraints it has to meet
- eliminating solutions which do not meet the constraints
- evaluating the remaining solutions against the outcome required
- assessing the risks associated with the 'best' solution
- making the decision to implement this solution

A problem is only solved when a solution has been implemented. In some situations, before this can take place, you need to gain acceptance of the solution by other people, or get their authority to implement it. This may involve various strategies of persuasion.

IV. Implementing the solution

This involves three separate stages:

- planning and preparing to implement the solution
- taking the appropriate action and monitoring its effects
- reviewing the ultimate success of the action

Implementing your solution is the culmination of all your efforts and requires very careful

planning. The plan describes the sequence of actions required to achieve the objective, the timescale and the resources required at each stage. Ways of minimising the risks involved and preventing mistakes have to be devised and built into the plan. Details of what must be done if things go wrong are also included.

Once the plan has been put into effect, the situation has to be monitored to ensure that things are running smoothly. Any problems or potential problems have to be dealt with quickly. When the action is completed it's necessary to measure its success, both to estimate its usefulness for solving future problems of this type and to ensure that the problem has been solved. If not, further action may be required.

These stages provide a very flexible framework which can be adapted to suit all problems. With **closed problems**, for example, where there is likely to be **only one or a few solutions**, the **emphasis** will be on **defining and analysing the problem to indicate possible causes**. **Open-ended problems**, on the other hand, **require more work at the idea generation stage to develop a large range of possible solutions.**

At any stage in solving a problem it may be necessary to go back and adapt work done at an earlier stage. A variety of techniques and strategies are available to help you at each stage and these are described in later part.

EFFECTIVE PROBLEM SOLVING TOOLS

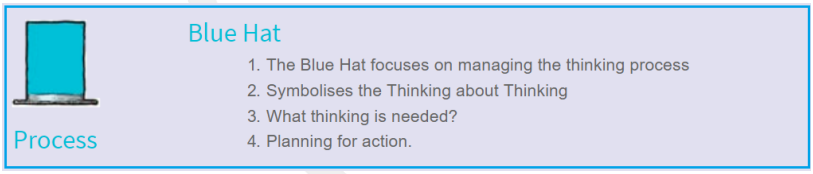
IMPORTANT

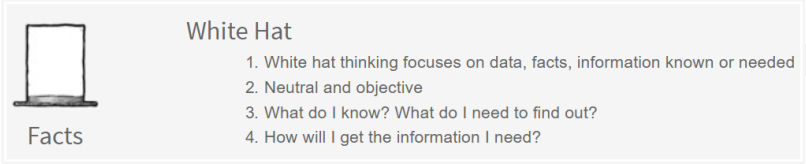
In today's workplace, the responsibility of problem solving is no longer an exclusive responsibility of the people occupying seats of upper management, rather, a responsibility that everyone in the organization shares. Effective problem solving skills allow employees throughout the organization to examine problems, identify, assess, and evaluate. Here are a few effective problem solving tools which show great results.

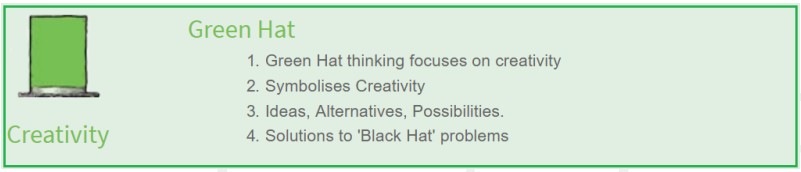
1. BONO'S SIX THINKING HATS:

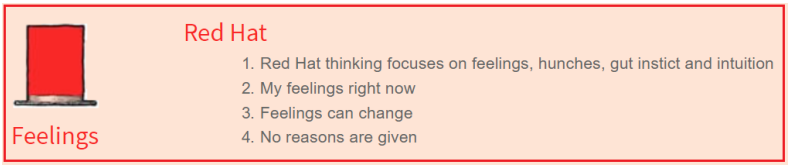
Six Thinking Hats is the proven technique from **Edward de Bono**, the creative thinking guru. Sometimes referred to as '6 hats' or 'the six hats of thinking', these techniques focus on enhancing the structure of thinking so that group decision making and idea evaluation can be dramatically improved.

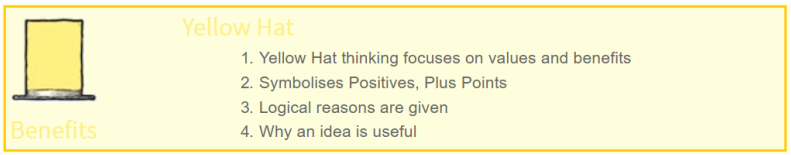
Six Thinking Hats is a time-tested, proven, and practical thinking tool. It provides a framework to help people think clearly and thoroughly by directing their thinking attention in one direction at a time - white hat facts, green hat creativity, yellow hat benefits, black cautions, red hat feelings, and blue hat process.

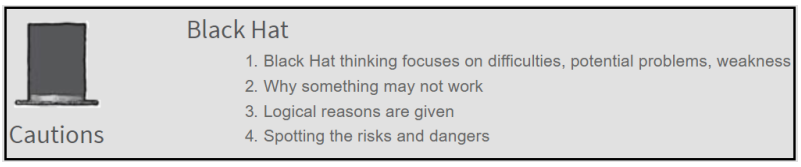








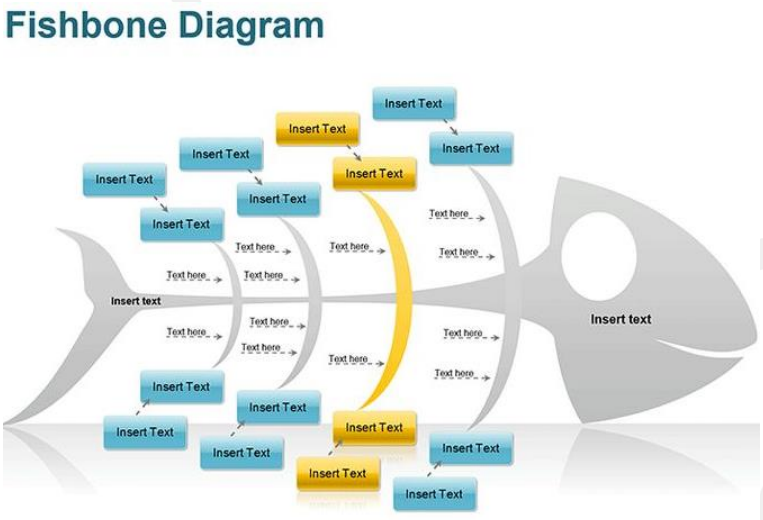




It's a **simple mental metaphor**. Hats are easy to put on and to take off. **Each hat is a different colour which signals the mode of thinking.** In a group setting each member thinks using the same thinking hat, at the same time, on the same thinking challenge—we call this focused parallel thinking.

2. FISHBONE DIAGRAM OR ISHIKAWA DIAGRAM:

Dr. Kaoru Ishikawa, a Japanese quality control expert, is credited with inventing the fishbone diagram. A fishbone diagram, also called a cause and effect diagram or Ishikawa diagram, is a visualization tool for categorizing the potential causes of a problem in order to identify its root causes.



A fishbone diagram is useful in brainstorming sessions to focus conversation. After the group has brainstormed all the possible causes for a problem, the facilitator helps the group to rate the potential causes according to their level of importance and diagram a hierarchy. **The design of the diagram looks much like a skeleton of a fish. Fishbone diagrams are typically worked**

right to left, with each large "bone" of the fish branching out to include smaller bones containing more detail.

Steps to create a fish or Ishikawa diagram:

The steps are as follows:

Below are the steps given to create a fish diagram followed by a general example

1. Create a head, which lists the problem or issue to be studied.

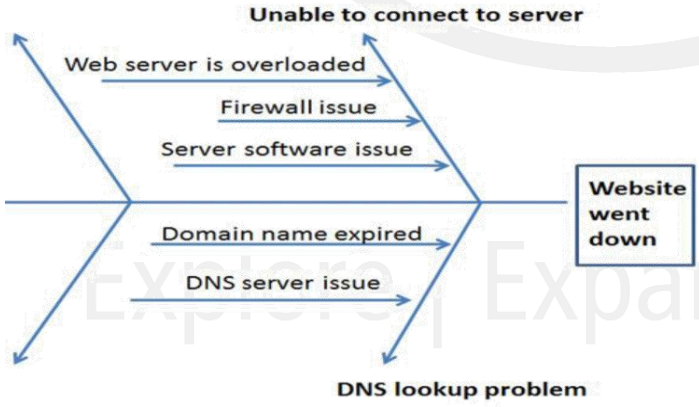
2. Create a backbone for the fish (straight line which leads to the head).

3. Identify at least four “causes” that contribute to the problem. Connect these four causes with arrows to the spine. These will create the first bones of the fish.

4. Brainstorm around each “cause” to document those things that contributed to the cause. Use the 5 Whys or another questioning process such as the 4P’s (Policies, Procedures, People and Plant) to keep the conversation focused.

5. Continue breaking down each cause until the root causes have been identified.

This example illustrates how a group might begin a fish diagram to identify all the possible reasons a website went down in order to discover the root cause.



This explains the application of fish diagram in problem solving.

FINAL WORD ON PROBLEM SOLVING METHODS

Individual knowledge, ability and motivation will affect how the decision-maker and the problem interact. This in turn influences the strategy used and affects the final outcome. Poor decisions may be made due to cognitive biases. Decisions will invariably be affected by the individual's attitudes, values and beliefs.

In conclusion, it is clear there are many benefits to using a problem solving model. Models help the individual and the organisation to gain a better understanding of how problems can be solved and how decisions are made. This in turn facilitates effective problem-solving strategies and leads to productive decision-making.

To some extent, and more so for some than others, we are all problem solvers. Most of the time we use ad hoc, informal, personal processes to solve problems. And, these often work at the "good enough" level. However, sometimes we miss good solutions, and even fail to identify the problem correctly in the first place.

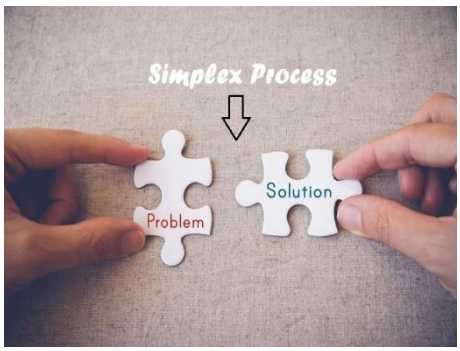
Therefore, the use of a problem-solving model makes it more likely that the individual and organisation will arrive at a solution that is acceptable. Simplex process is one such method used more likely in the corporate world. Let us explore more about this method in the next part.

PROBLEM SOLVING METHODS FOR COMPLEX PROBLEMS

SIMPLEX PROCESS – WHAT IS IT?

When you're solving complex problems, it is easy to skip over important stages, meaning that you can miss good solutions, or, worse still, fail to identify the problem correctly in the first place.

One way to prevent this happening is by using a tool like the Simplex Process. **The Simplex Process is a simple, yet powerful method for solving problems and executing projects of any scale. The process, instead of being represented as a single, straight-line process is represented as a circle. This reminds us of the importance of continuous improvement.**



This powerful step-by-step tool helps you identify and solve problems creatively and effectively. It guides you through each stage of the problem-solving process, from finding the problem to implementing a solution. **This helps you ensure that your solutions are creative, robust and well considered.**

ADVANTAGES OF SIMPLEX PROCESS

The advantages of the Simplex Process are,

- **Systematic:**

Problems can be effectively resolved by approaching the solution in a systematic way.

- **Creative:**

Problems can be efficiently resolved by looking at it in a most creative way.

- **Organized:**

Everything will be organised and properly planned.

- **Development:**

Helpful in developing leadership qualities.

Above are the advantages of Simplex Process which will allow an individual to grow at interpersonal and professional levels.

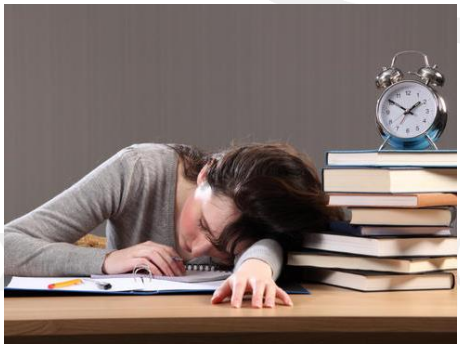
DISADVANTAGES OF SIMPLEX PROCESS

The disadvantages of Simplex Process are,

- **Time Consuming:**

This method is a little time consuming.

- **High Effort:**



Looking at a problem step by step by considering all possibilities may become a lengthy procedure.

- **Prone to Delays:**

Giving preference to minute details may mislead the decisions.

- **Hard to Schedule:**

Problem resolution may exceed the expected time.

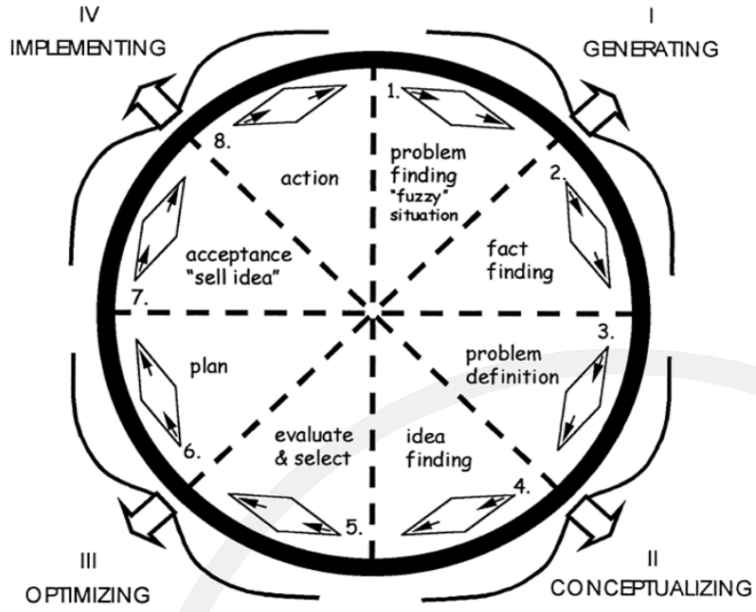
Simplex process may not be effective always. Since, it is time consuming this may delay the decision making process. Hence, simplex process will be an effective method only for relatively small and simple problems.

STEPS IN SIMPLEX PROCESS

IMPORTANT

Rather than seeing problem-solving as a single straight-line process, Simplex is represented as a continuous cycle. This means that problem-solving should not stop once a solution has been implemented. Rather, completion and implementation of one cycle of improvement should lead straight into the next.

This process is suitable for problems and projects of any scale. It uses the eight stages shown in the figure below:



We'll now look at each step in more detail.

1. Problem Finding:

Often the problem is obvious. But, sometimes the obvious problem we see addresses the symptoms and not the root cause. So, it's helpful to stop before jumping into solution mode to ask some questions:

a. What would our customers what us to improve?
b. What could clients do better if we could help them?
c. What's failing in the process?

2. Fact-Finding:

The next stage is to research the problem as fully as possible. This is where you:

a. Understand fully how different people perceive the situation.
b. Analyse data to see if the problem really exists.
c. Explore the best ideas that your competitors have had.
d. Understand customers' needs in more detail.
e. Know what has already been tried.
f. Understand fully any processes, components, services, or technologies that you may want to use.
g. Ensure that the benefits of solving the problem will be worth the effort that you'll put into solving it.
h. With effective fact-finding, you can confirm your view of the situation, and ensure that all future problem-solving is based on an accurate view of reality.

3. Problem Definition:

Now that you understand the problem area, you can define the specific issue you are going to address. You need to get the issue bounded appropriately. Too broad and you'll not have either the time or the resources to address the issue effectively. Too narrow and you may only address the symptoms. Basadur suggests asking "Why?" to explore broadening a question and "What's stopping you?" to narrow one.

4. Idea Finding:

Here you generate problem solving ideas. Talk with your team and your colleagues. Use focus groups or brainstorming. This is a step of generating ideas, not of analysing or critiquing them.

5. Evaluation and Selection:

In this step, you evaluate the ideas that have been developed and choose one to take forward. That choice might be very obvious. If not, you evaluate the options by keeping the following aspects in mind such as consistency, impact, cost, and its benefits.

6. Planning:

Once you've made a choice, it's time to plan the implementation. For solving small problems or executing small projects, a set of action steps, like the IT Leaders Program uses for setting personal goals, may be adequate. Larger problems or projects will benefit from using a more formal project management approach.

7. Sell the Idea:

If you have not already done so, now is the time to let the stakeholders associated with your idea in or what you and your team are up to. (This may be an appropriate time to flip back to the pages in your Leaders Program workbook to the discussion there about stakeholder communication. Since larger solutions will involve culture, internal politics, and change, you may want to scan those topics as well.)

8. Action:

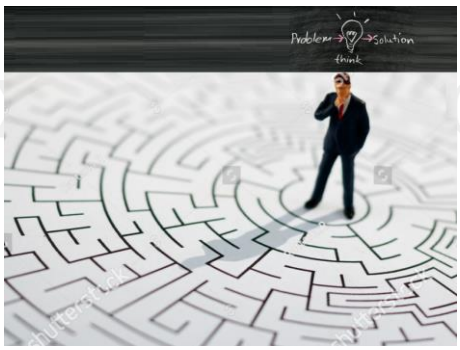
Now that you have finished your preparation, it's time to get to work on the solution. Here's where the careful thinking and planning pays off with a faster, less eventful solution.

Although following these eight simple steps may seem laborious, experience is that it pays off even for simple problems.
Think of these steps as a plan, a simple checklist: Perceived Problem and the data associated with it. The problem solver and the options available to solve the problem.

Choosing the best possible option and convincing the victims of the problem to join hands.

Solve the problem and deliver the solution.
These steps are helpful in solving any kind of problems.

SIMPLEXITY THINKING



Invented by Dr. Min Basadur, the system is simple, experiential and inclusive. Simplexity thinking helps in simplifying complexity and provides a language of innovation everyone can

use for anticipating and proactively seeking out new opportunities and implementing creative solutions on the job.

Simplexity Thinking emphasizes working with others in harmony to discover important opportunities for improvement in both products and procedures and creating and implementing practical new ideas.

SIMPLEXITY THINKING - HOW IS WORKS?

IMPORTANT

The Simplexity System is our method of applied creativity that interconnects a process of creative problem solving with skills and tools to make that process work.

I. Interconnections:

The one reason why our clients find the Simplexity Thinking System so powerful is due to the interconnectedness of our skills, process and profile. We use Simplexity Thinking to build applied creativity skills in individuals, teams and organizations.

II. Skills:

The Simplexity Thinking system recognizes that everyone is creative and that everyone contributes to the creative process in different ways.

III. Process:

The Simplexity Thinking system recognizes a proprietary three-phase process of creative problem solving and innovative thinking that helps you solve complex problems, uncover fresh opportunities and take them to action!

IV. Profile:

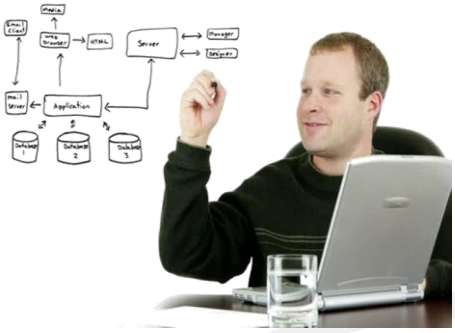
The Simplexity Thinking system is a proprietary tool for discovering your own creative style and respecting those of others. Each of us has our own unique blend of creative styles.

The Simplexity Thinking system is designed to describe individual methods of problem solving. Its aim is to describe how individuals solve problems, not to evaluate problem solving ability.

1. Generator:

Creates options in the form of new possibilities or new problems that might be solved and new opportunities that might be capitalized on.

2. Conceptualizer:



Creates options in the form of alternate ways to understand and define a problem or opportunity, and good ideas that help solve it.

3. Optimizer:

Creates options in the form of ways to get an idea to work in practice and uncovering all of the factors that go into a successful implementation plan.

4. Implementer:

Creates options in the form of actions that get results and gain acceptance for implementing a change or a new idea.

Everyone is a combination of all four quadrants. All quadrants are equally valued and necessary to the creative problem solving process.

CAREER PLANNING AND SIMPLEXITY THINKING

Problem solving skills and the problem-solving process are a critical part of daily life both for individuals and organizations. Developing and refining these skills and methods through training, practice and learning can provide the ability to solve problems more effectively and over time address problems with a greater degree of complexity and difficulty.

Problems and crisis are common in everyone's career. Handling them with a proper and effective method is a challenge for everyone. Simplex process is one such method, relying on this approach gives a wide view on resolution of the problem. Simplex process always helpful in overcoming the hurdles with an open mind and elaborates the ideas on what best can one get.

MAKE SURE YOU REVISE

- ✓ PROBLEM SOLVING AND STAGES OF PROBLEM SOLVING.
- ✓ EFFECTIVE PROBLEM SOLVING. TOOLS- BONO'S SIX THINKING HATS.
- ✓ EFFECTIVE PROBLEM SOLVING. TOOLS- ISHIKAWA DIAGRAM.
- ✓ STEPS OF SIMPLEX PROCESS.
- ✓ ADVANTAGES OF SIMPLEX PROCESS.
- ✓ DISADVANTAGES OF SIMPLEX PROCESS.
- ✓ SIMPLEXITY THINKING - HOW IS WORKS?
- ✓ ALL THE TEXT IN **BOLD.**

IMPORTANT