SOFT SKILLS FOR PUBLIC MANAGERS

# Handbook on Problem-solving Skills

CENTRE FOR GOOD GOVERNANCE
Knowledge • Technology • People


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## About CGG

The Centre for Good Governance (CGG) was established by the Government of Andhra Pradesh (GoAP) in October 2001 to help it achieve the goal of 'Transforming Governance'. CGG supports the design and implementation of GoAP's Governance Reform Programme. CGG undertakes action research, renders professional advice to, and conducts Change Management and Management Development Programmes for Government Departments and public agencies to help them implement their reform agenda successfully.

## Acknowledgements

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## Purpose of this Handbook

The handbooks on Soft Skills developed by Centre for Good Governance are intended primarily for the personnels in public administration. They offer an overview of some of the principal skills that are essential for effective performance.

They draw heavily upon existing literature from the academia and current practices in public and private organizations around the world and include numerous references and links to useful web resources.

They are not comprehensive 'guides' or 'how to' booklets. Rather, they incorporate the perspectives of experts in the specific domains whose knowledge, insights, advices and experiences prove handy in honing skills essential for strengthening the capacity for effectiveness of public service at all levels of government.

This handbook, *Problem-solving Skills,* focuses on how the personnel in the public administration can develop approaches and strategies that will enable them to effectively solve problems in a variety of contexts.

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# 1 Introduction

> "Most people spend more time and energy going around problems than in trying to solve them." **Henry Ford**

Good problem solving skills empower managers in their professional and personal lives. Good problem solving skills seldom come naturally; they are consciously learnt and nurtured. The repertoire of good problem solving skills includes:

- developing creative and innovative solutions;
- developing practical solutions;
- showing independence and initiative in identifying problems and solving them;
- applying a range of strategies to problem-solving;
- applying problem-solving strategies across a range of areas;

## What is a Problem?

**1. A problem is an opportunity for improvement.** "Every problem has a gift for you in its hands," says Richard Bach**.** Someone coined the word "probortunity" – an acronym combining the words "problem" and "opportunity". A probortunity is a reminder to look at problems as possible opportunities. An optimist looks at challenging or problematic events as potential opportunities for improvement. He is seen always seeking answers for the questions such as:

- Is there more than one probortunity?
- Is it my personal probortunity? Is it the organization's probortunity?
- Is it an actual probortunity or just an annoyance?
- Is this the real probortunity, or merely a symptom of a larger one?

**2. A problem is the difference between the actual state and desired state.** A problem could also be the result of the knowledge that there is a gap between the actual and desired or ideal state of objectives. Clarity of the problem is determined by the clarity of the knowledge of what precisely one wants and what one has. Greater clarity of the problem helps in finding a better and effective solution.

**3. A problem results from the recognition of a present imperfect and the belief in the possibility of a better future.** The belief that one's hopes can be achieved will give one the will to aim towards a better future. Hopes challenge one's potential, and challenge is another definition of a problem.

When confronted with a problem, according to Robert Harris ("Introduction to Problem Solving"), people are likely to adopt either of the two approaches – spot it or mop it.

**1. Stop It**

A stop-it approach seeks to solve a problem, so that the problem no longer exists. Its three forms are prevention, elimination, and reduction.

- **Prevent It.** Preventing a problem from occurring or recurring is the most ideal solution. The prevention approach is often a difficult one to apply because it requires predictive foresight ("this might be a problem someday if we don't act now"). For example, by preventing a cold, or an automobile accident, one can avoid the need to deal any further with a problem or its effects.
- **Eliminate It.** Eliminating a problem once and for all is also an ideal way of attacking a problem. If a tank were leaking, an elimination solution would be to plug/seal or otherwise repair the leak, the cause of the problem. To solve by eliminating should be considered in nearly every problem situation.
- **Reduce It.** The magnitude of any problem can be lessened by reducing its size. Suppose the tank is leaking and a repair (an elimination-solution) is not possible until a day or two later. The problem could be reduced by turning off

the incoming water. Without line pressure on the tank, the leak would slow down; that would be better than a full force leak.

### 2. Mop It

A mop-it approach focuses on the effects of a problem. Instead of treating the leak itself, the water on the floor is mopped up - the effects of the problem.

- **Treat It.** Here the damage caused by the problem is repaired or treated. The water on the floor is mopped up and the damaged floor is fixed. But, it should be noted that: (1) by itself a treat-it solution is not going to be nearly as effective as some form of stop-it solution and (2) treat-it solutions are often needed in addition to an elimination or reduction form of solution.
- **Tolerate It.** In this form of mop-it approach, the effects of the problem are put up with. In the leaky water example, one might install a drain in the floor, or waterproof the floor. The effects are taken for granted and measures are taken to endure them.
- **Redirect It.** Here the problem is deflected. Sometimes the problem will simply be redefined as not a problem. It is hard to think of a legitimate redirection for the leaking water problem, but suppose that the leak is small and the floor is not being damaged. One might say, “Well, I need the humidity; the leak is actually a good thing.” It should be remembered that a problem is a problem only when someone defines it as such.

Managers must take cognizance of the fact that problem solving is an ongoing activity. Prof. Jeff Malpas (“Problem solving for Managers”) says: “No problem is ever totally solved. Every problem has a solution, but every solution with it brings a new problem. Some well-known management techniques emphasize the idea of continuous improvement and successful problem-solving is seen as part of such continuous improvement.”

Managers should know that problem-solving is less a matter of continuous improvement as of continuous adjustment. Every solution will have unintended consequences. Every

effective system gives rise to friction and failure. Good management and effective problem-solving depend upon a willingness to adapt to the situation and recognize the ongoing and partial character of all attempts to manage or to solve.

## Just ask 'Why?'

Sometimes, as we look for approaches to creative thinking, we forget that many of the most powerful techniques are also the simplest...

Leonardo da Vinci, one of the most creative thinkers in history, says of his inspiration:

"I roamed the countryside searching for answers to things I did not understand. Why shells exist on the tops of mountains along with imprints of plants usually found in the sea. Why thunder lasts longer than that which causes it. How circles of water form around the spot which has been struck by a stone. And how a bird suspends itself in the air. Questions like these engaged my thought throughout my life".

It is easy to forget, as we rush through our lives, that curiosity is an essential foundation for creativity.

**Look around the world, keep asking 'Why?' and 'Why not?', and you will soon see new opportunities.**

Source: Idea Champions

## 2 Causes of Poor Problem-Solving

Ineffective or poor problem-solving can be the result of any of the following factors. These factors act like blinkers, constricting the perspective of person in the process of problem-solving.

**1. Bounded Rationality:** Propounded by Herbert Simon, the concept of bounded rationality assumes that individuals make decisions by constructing simplified models that extract the essential features from problems without capturing all their complexity. Simon remarks that a majority of the people are only partly rational, and are in fact emotional/irrational in the remaining part of their actions. He indicates two major causes of bounded rationality:

a. Limitations of the human mind

b. The structure within which the mind operates

He states that boundedly rational people experience limits in formulating and solving problems. As a result, when calculating expected utility, people do not make the best choices.

For example, a person may choose to buy a particular brand of new cell-phone, based on the information he gathered from advertisements and friends. Constrained by bounded rationality, he will turn down even if he is offered a better bargain. Often, bounded rationality could also be caused by “inverted intelligence” - clever people who can easily argue that the information must be wrong.

**2. Satisficing:** Satisficing implies identifying and implementing a solution that is “good enough.” According to Herb Simon, who coined the term, the tendency to ‘satisfice’ results in solving problems which do not lead to optimal solutions. Most often, people look for solutions that had worked for them before. There may be better ways to reach the outcome, but they simply ignore them. Searching for alternative and superior solutions might entail an extra cost. The alternative solution might not prove worthy enough, if the extra costs are not justified. On the other hand, the implicit costs of

ignoring the alternative solution can be relatively greater if the chosen solution, based on prior experience, fails to deliver the expected outcome.

Michael Slote ("Satisficing Consequentialism") gives the following examples of satsificing. One involves a fairy-tale hero who, when rewarded by the gods with whatever he asks for, just asks for himself and his family to be comfortably well-off. Another involves a motel owner who gives some stranded motorists the first available room rather than the best available room.

**3. Groupthink:** **'**Groupthink' is a term coined by psychologist Irving Janis. 'Groupthink' is a phenomenon in which the norm for consensus overrides the realistic appraisal of alternative courses of action. It describes situations in which group pressures for conformity discourage the group from critically appraising unusual, minority, or unpopular views. 'Groupthink' is a bug that strikes groups and can dramatically hinder their performance.

Some of the symptoms of 'Groupthink' are:

- **Illusion of Invulnerability**: Members ignore obvious danger, take extreme risk and are overly optimistic.
- **Collective Rationalization**: Members discredit and explain away warning contrary to group thinking.
- **Illusion of Morality**: Members believe their decisions are morally correct, ignoring the ethical consequences of their decisions.
- **Excessive Stereotyping**: The group constructs negative stereotypes of rivals outside the group.
- **Pressure for Conformity**: Members pressure any in the group who express arguments against the group's stereotypes, illusions, or commitments, viewing such opposition as disloyalty.

- **Self-Censorship**: Members withhold their dissenting views and counter-arguments.
- **Illusion of Unanimity**: Members perceive falsely that everyone agrees with the group's decision; silence is seen as consent.
- **Mindguards**: Some members appoint themselves to the role of protecting the group from adverse information that might threaten group complacency.

**4. Groupshift:** 'Groupshift' is a phenomenon in which the initial positions of individual members of a group are exaggerated toward a more extreme position. More often, however, the shift is toward greater risk. What happens in groups is that the discussion leads to a significant shift in the positions of members toward a more extreme position in the direction in which they were already leaning before the discussion. Conservatives become more cautious, and the more aggressive take on more risk.

The 'Groupshift' can be viewed as actually a special case of 'groupthink'. The decision of the group reflects the dominant decision-making norm that develops during the group's discussion. The greater occurrence of the shift toward risk can be due to any of the following reasons:

- Discussion creates familiarization among the members. As they become more comfortable with each other, they also become more bold and daring.
- People admire individuals who are willing to take risks. Group discussion motivates members to show that they are at least as willing as their peers in terms of taking risks.
- The most plausible explanation of the shift toward risk, however, seems to be that the group diffuses responsibility.
- Group decisions free any single member from accountability for the group's final choice.

**5. Conformation Bias:** Conformation bias is the tendency on the part of the people to search for only for that information that supports their perceived notions. Initial perceptions and ideas of people about a problem often shape the search process for information. It is important to maintain objectivity in evaluating ideas so that they are not biased toward their initial perceptions. The possible solutions include:

- Considering alternative hypotheses - view the problem from different perspectives.
- Looking for evidence to disprove their ideas - showing that a particular idea is incorrect is as important as showing an idea is correct.
- Maintain objectivity while evaluating ideas to minimize personal bias.
- Drawing conclusions based upon the evidence, not upon their personal beliefs.

**6. Insufficiency of Hypotheses** - Often, while solving problems, a solver seizes upon the first explanation that comes to mind and stops thinking about the problem. This difficulty is related to confirmation bias, but reflects insufficient thought applied to a problem. Many times, the immediate answer is sufficient. Other times, however, only a careful analysis of a situation beyond the immediate response is necessary to ensure a correct solution. To avoid poor problem-solving resulting from insufficiency of hypothesis, people should develop alternative ideas, rather than seizing upon the first idea as the solution. They should spend time thinking about the issues - allow time for reflection and avoid framing the problem so that only one idea emerges.

**7. Fixation** - Fixation is the inability to see a problem from a fresh perspective. Again, initial perceptions and structuring of a problem often determine the approaches people use to solve that problem. Structuring a problem incorrectly is a prime contributor to the inability to solve a problem correctly. To overcome fixation, people should see the problem with “fresh eyes” - allow time for reflection and incubation. They should focus on other issues, and then return to the original problem. Time away from a problem allows one to forget incorrect solutions and focus on developing new ideas.

**8. Other Obstacles** – Problem-solving can be impaired by biases of personal beliefs, a misunderstanding of information relevant to solving problems, and overconfidence. The solution is to study a problem objectively with all available accurate information and use objective reasoning to achieve a reasonable, sound decision. People should be sure that they understand the problem and find what constitutes a solution. They should obtain as much accurate and comprehensive information from unbiased sources possible and maintain objectivity in evaluating ideas to minimize personal bias. They should assess their decisions critically and be able to defend their ideas.

### The story of the Gordian Knot

In 333BC, as Alexander the Great was leading his armies across Asia, he reached the city of Gordian in Phrygia. There he was shown the chariot of the ancient founder of the city, its pole lashed to the yoke by means of an intricate knot.

According to tradition, this knot was to be untied only by the future conqueror of Asia. Many had tried, and all had failed…

Legend has it that Alexander looked at the knot, drew his sword and sliced through the knot with a single blow. Shortly afterwards, under his rule, Asia was united for the first time.

**The moral of this story: Sometimes it's better not to get too tied up in a problem. Leap for a bold solution!**

Source: Idea Champions

# 3 Key Approaches to Problem-Solving

There are several different ways of problem-solving – all with their own advantages and disadvantages. The process an individual adopts as a manager will be influenced by organizational policies, the kind of information available about the problem and his/her own personality and communicative style. Broadly, there are three problem-solving models available to a manager.

## 1. Rational Problem-Solving

The brain can think in two ways - emotionally (governed by instinctive feelings) and rationally (governed by acquired knowledge and beliefs).

Emotional thinking happens in the **limbic system** - an interconnected system of brain nuclei associated with basic needs and emotions, for example, hunger, pain, pleasure, satisfaction, sex, and instinctive motivation"). When something catches one's attention, the brain, in a lightning flash, looks through all the inherited and remembered patterns to see if there is a match, and responds with the closest pattern that it can find. Emotional thinking is very clear-cut, black and white, all or nothing. For example, when a black shape on the path looks like a snake, one feels frightened and runs away.

Rational thinking, on the other hand, is a function of the part of the brain called the **neocortex** - the wrinkled outer layer of the front parts of the brain (the cerebral hemispheres), the functions of which include the perception of sensations, learning, reasoning and memory. The power to think rationally gives an individual greater flexibility of response. One has a lot more control over what one does. So that one realizes that the black shape on the path, though it looks like a snake, could also be a stick, examines it more closely before deciding what to do.

Rational problem solving rests on the following principles (R. K. Wagner - "Learning to solve practical problems"):

- Problems are identified by comparing actual performance with an expected standard performance

- Problems are deviations in actual performance from the expected standard
- A precise and complete description of the problem is needed to identify a solution:
    a) What is happening?
    b) Where is it happening?
    c) When is it happening?
    d) To what extent is it happening?
- The cause of the problem will be found by comparing problem and non-problem situations.
- Recent problems are a result of some change in the situation that has caused an unwanted deviation from expectations.

The Rational Decision-Making Model requires the following steps which, if followed, are assumed to lead to “value-maximizing choices.” The steps are as follows:

- define the problem,
- identify the decision criteria,
- weigh the criteria to determine rank of importance,
- generate possible alternative solutions,
- rate each alternative on each criteria, and
- compute the optimal decision.

The case again rational problem-solving is the flawed assumption that every problem is defined clearly and precisely, which might not be always possible. Also, rating each of the alternative problem-solutions relatively in terms of set or predetermined criteria can be a tricky task.

## 2. Lateral or Creative Problem-Solving

During 1950 -1960, some significant research was done by Roger Sperry, which won him the Nobel Prize for Medicine in 1981. Sperry's work demonstrated that human brain is divided into two major parts or hemispheres - the right brain and the left brain.

The left brain is associated with verbal, logical, and analytical thinking. It excels in naming and categorizing things, symbolic abstraction, speech, reading, writing and arithmetic. The left brain is very linear: it places things in sequential order - first things first and then second things second, etc. Left brain engages in a very systematic, sequential and exact approach to getting the job done. The left brain strives for accuracy in the process of the job being done.

The right brain, on the other hand, functions in a non-verbal manner and excels in visual, spatial, perceptual, and intuitive information. It is associated with the realm of creativity. The right brain processes information differently than the left brain. The processing happens very quickly and the style of processing is non-linear and non-sequential. The right brain looks at the whole picture and quickly seeks to determine the spatial relationships of all the parts as they relate to the whole. This component of the brain is not concerned with things falling into patterns because of prescribed rules.

So, lateral or creative problem solving does not follow a standard set of procedures. It is a 'subconscious process based on past distilled experiences'. It is based more on the gut feeling of the manager than on an objective process of weighing alternatives. There are a set of conditions and it is accepted that under those conditions intuitive approach is generally preferred to rational approach. Intuitive method is preferred when:

- a high level of uncertainty exists,
- there is little precedence to draw on,
- variables are not reliably predictable,
- facts are limited or facts are contradictory,

- analytical data are of little use,
- there are several plausible solutions; and
- time is limited and decision must be made

The creative problem-solving is flexible. So it can be used to examine real problems and issues. According to ‘brainstorming’ creator Alex Osborn and Dr Sidney Parnes, creative problem-solving process involves six steps, which together provide a structured procedure for identifying challenges, generating ideas and implementing innovative solutions. Following are the six steps:

1. **Objective (Mess) Finding:** The problem solver discusses the situation about the problem and brainstorms a list of objectives or goals which he/she might have for him/her creative effort. Through some process, arrive at consensus on one or more objectives the group is willing to attempt.
2. **Fact Finding:** The problem-solver brainstorms all the facts which might even remotely be related to the objective. S/he has made sure that each perspective and participant is represented on the listing. S/he has to take some time for the participants to point out which facts they feel are most relevant to the objective and its eventual solution.
3. **Problem-Solving:** One of the most powerful aspects of creativity is rephrasing the problem definition to one which is both closer to the real problem and reveals more obvious solutions. One technique for this is to brainstorm different ways to state the problem. Most people recommend that the problem statement be written as: “In what ways might we…” One has to pay particular attention to changing the verbs and the nouns in the problem statement. Asking “Why?” and “How?” will also result in some interesting problem statements. Let the owner of the problem select the statement or statements which seem to best capture the “real” problem.

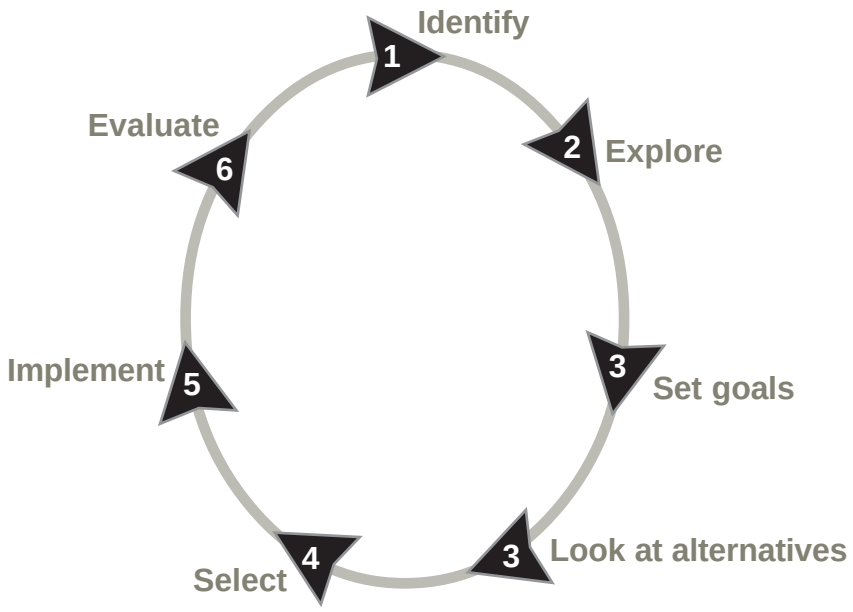
4. **Solution Finding:** In this step, the ideas with the greatest potential are evaluated and the problem owner selects an idea or set of ideas to take action on. One of the most effective methods for this step is to brainstorm the criteria which determine the best idea, like cost, appearance, etc., then select the most useful criteria. These criteria are then used in a decision matrix in which every idea is evaluated on every criterion and the judgments combined to select the idea worth putting into action.

5. **Acceptance Finding:** In this phase, the problem solvers consider the real world issues of the change from the old way to the proposed new way as well as issues that are likely to have a bearing upon the acceptance and implementation of the envisaged change. The ideas developed in this step are then integrated into the plan, increasing it's likelihood of success.

Unlike many other problem-solving methods, the process emphasizes the need to defer judgment on possible ideas and solutions until a final decision is made. In this way, the flow of ideas in the third step is not interrupted, and possible solutions, however, bizarre, are accepted.

## 4 Problem-Solving Process

There is a variety of problem-solving processes. But each process consists of a series of steps - identifying the problem, searching for possible solutions, selecting the most optimal solution and implementing a possible solution. It is useful to view problem solving as a cycle because, sometimes, a problem needs several attempts to solve it or the problem changes. The diagram below shows a seven-step problem solving process.




**1. Identifying the Problem:** The first step in the problem solving process is sizing up the situation to identify the problem. That sounds simple enough, but sometimes managers might be uncertain about what the problem is; they might just feel general anxiety or be confused about what is getting in the way of their objectives. If that is the case, they can ask themselves or their friends or a professional expert. Other useful techniques for identifying the problem include-

- Comparison with others
- Monitor for weak signals
- Comparison of current performance with objectives or past performance
- Checklists
- Brainstorming

- Listing complaints
- Role playing

**2. Exploring the Problem:** Having identified the problem, managers should analyze it to see what the root cause is. Often people get caught up in symptoms or effects of a problem or issue and never get down to the real cause. They get mad at someone's attitude, anger, or actions, which are not the cause of the problem. The key here is to focus on analyzing the problem for the real cause without being affected by emotional issues. Seeing answers for questions such as the following will help explore the problem:

**Identify the Problem – Ask Who?**

- Who says that this is a problem?
- Who caused or is causing the problem?
- Whom does it or will it affect?
- Who has done something about the problem?

**Identify the Problem – Ask What?**

- What happened or will happen?
- What are the symptoms?
- What are the consequences for others?
- What circumstances surround the occurrence of the problem?
- What is not functioning as desired?

**Identify the Problem – Ask When?**

- Did it or will it happen?
- Why did it happen?
- When did it first occur?

**Identify the Problem – Ask Where?**

- Where is the problem occurring?
- Did it or will it have an impact?
- Where did it have an impact?

**Identify the Problem – Ask Why?**

- Why is this, a problem?
- Did it or will it occur?
- Why did it occur?
- Why was nothing done to prevent the problem from occurring?
- Why did no one recognize and do something about the problem at the earliest?
- Why is a response needed now?

**Identify the Problem – Ask How?**

- How should the process be working?
- How are others dealing with this or similar problems?
- How do you know this is a problem; what supporting information do you have?

Once the cause is found, plans can be made to fix it. Analyzing implies gathering information. If there is not enough information, they should figure out how to research and collect it

**3. Set Goals:** Having explored and analyzed the problem, managers should be able to write a goal statement that focuses on what is the successful end of the process. Making and writing down a goal statement:

- helps them to clarify the direction to take in solving the problem; and
- gives them something definite to focus on

That is, what will occur as a result of the solution? This whole process is about closing or fixing the gap between the problem and the goal. Writing down the problem ensures that they are not side-tracking from, but addressing the problem.

**4. Look at alternatives:** Now that the problem has been analyzed, the managers can begin to develop possible solutions. This is a creative as well as practical step where every possible solution is identified. They should identify the various alternative solutions

available to them through such techniques as –

- Analysis of past solutions
- Reading
- Researching
- Thinking
- Asking Questions
- Discussing
- Viewing the problem with fresh eyes
- Brainstorming
- Sleeping on it

The idea is to collect as many alternative solutions as possible.

**Mind mapping** is another technique that can be used for identifying alternative solutions. Developed by Tony Buzan in the 1970's, mind mapping uses pictures and/or word phrases to organize and develop thoughts in a non-linear fashion. It helps people "see" a problem and its solution. Here's how to do mind mapping:

- Take a sheet of plain paper and turn it sideways (if using flipchart paper you don't need to turn it sideways - it is large enough); Using colored felt pens, draw a small picture (or write a phrase) in the centre of the paper representing the issue you want to solve; Draw lines out from the main problem (it helps to use different colors for each line).
- Each line should represent a different aspect of your problem or issue;
- Write down what each line represents either on top of or on the line;
- Add other lines flowing off these main lines;
- Write a word or short phrase on the smaller lines indicating what each new line represents (you may find that mind mapping works best for you if you write down the phrases or draw the images first and then connect them with the lines); and
- If you want, add images next to your main line that illustrate what each line means to you (some people think better with pictures, others with words).

**5. Select the best solution:** Now that there are a wide variety of possible solutions, it is time to select the best solution to fix the problem, given the circumstances, resources and other considerations. Here the managers are trying to figure out exactly what would work best given the nature of the problem. There are always a number of things that can affect a solution, for instance, money, time, people, procedures, policies, rules, and so on. All of these factors must be thought about. Managers should prioritise the solutions by their effectiveness. This is a slow process of elimination. There may be some possible suggestions that are immediately eliminated. Eventually, managers should narrow down the choices to one best possible solution which will promise the best or optimal outcomes.

**6. Implementation:** Implementation is a crucial part of problem-solving process. In order to implement the solution chosen, managers must have an action plan and communicate it to those directly and indirectly affected. Gemmy Allen ("Problem-Solving & Decision-Making") says that communication is most effective when it precedes action and events. In this way, events conform to plans and events happen when, and in the way, they should happen. Managers should answer the vital questions before they are asked, like –

- What should be communicated?
- What is the reason for the decision?
- Whom will it affect and how?
- What are the benefits expected for the individual, the department, and the organization?
- What adjustments will be required in terms of how work will be done?
- What, specifically, is each individual's role in implementing the decision?
- What results are expected from each individual?
- When does the action called for by the decision go into effect?

Communicating answers to these questions can overcome any resistance that otherwise might be encountered.

**7. Evaluation:** This is the final step in the problem-solving process. Managers should review the effectiveness of the solution against desired outcomes. Did the solution work? If not, why not? What went right, and what went wrong? What adjustments do they have to make to ensure that the solution works better? This stage requires careful analysis that improves upon the best solution.

The review of your progress can help a manager identify any problem. Steps may need to be revised or new steps added. One may need to consider a different solution, if the current one, he/she has been working with, is not helping.

**Essentials of Effective Problem Solving**

- **A clear description of the problem**
- **A description of the limiting (or negative) factors involved in the problem**
- **A description of the constructive (or positive) factors involved in the problem**
- **A clear delineation of the "ownership" of the problem** - Whose problem is it: mine, yours, the other guy's, my boss', my spouse's, my child's, my parents', my teacher's?
- **A clear description of the scope of the problem:** How extensive a problem is it? How long has this problem existed? How many people are affected? What else is affected by this problem?
- **A clear description of the consequences if the problem were not solved** - What is the possible impact on my family, job, life in this community, etc., if this problem isn't solved? What is the worst possible thing that could happen if this problem isn't solved?
- **A list of brainstormed solutions to the problem**, with each alternative analyzed as to its reality, its benefits, and the consequences for following each one.

- **A system of ranking each solution to finalize the decision-making process -** A rating system for analyzing each solution is developed, e.g., 100% chance of success, 75% chance of success, 50% chance of success.
- **A clear description of myself as a problem-solver -** When it comes to this problem, am I procrastinating? Am I avoiding the problem? Am I denying the problem? Am I shutting down or blocking my creativity on this problem? Am I ignoring it, hoping it will go away? Am I using magical and/or fantasy thinking in addressing the problem?
- **Determination to follow through on the solution decided upon jointly.** This involves full motivation to “take the risk” and pursue the solution to its fullest

# 5 Personality Types & Problem-Solving Orientations

According to Karl Jung's (Psychological Types), people are all different in fundamental ways. Their aptitude and competence to process different information is limited by their personality type. These types are eight in number, such as:

- People can be either Extroverts or Introverts, depending on the direction of their activity;
- Thinking, Feeling, Sensing, Intuitive, according to their own information pathways; and
- Judging or Perceiving, depending on the method in which they process received information.

## Extroverts vs. Introverts

Extroverts are directed towards the objective world whereas Introverts are directed towards the subjective world. The most common differences between Extroverts and Introverts are shown below:

| Extroverts | Introverts |
|---|---|
| • are interested in what is happening around them<br>• are open and often talkative<br>• compare their own opinions with the opinions of others<br>• like action and initiative<br>• easily make new friends or adapt to a new group<br>• say what they think<br>• are interested in new people<br>• easily break unwanted relations | • are interested in their own thoughts and feelings<br>• need to have own territory<br>• often appear reserved, quiet and thoughtful<br>• usually do not have many friends<br>• have difficulties in making new contacts<br>• like concentration and quietness<br>• do not like unexpected visits and therefore do not make them<br>• work well when alone |

### Sensing vs. Intuition

Sensing is an ability to deal with information on the basis of its physical qualities and its relation to other information. Intuition is an ability to deal with the information on the basis of its hidden potential and its possible existence. The most common differences between Sensing and Intuitive types are shown below:

| Sensing types | Intuitive types |
|---|---|
| • see everyone and sense everything<br>• live in the here and now<br>• quickly adapt to any situation<br>• like pleasures based on physical sensation<br>• are practical and active<br>• are realistic and self-confident | • are mostly in the past or in the future<br>• worry about the future more than the present<br>• are interested in everything new and unusual<br>• do not like routine<br>• are attracted more to the theory than the practice<br>• often have doubts |

### Thinking vs. Feeling

Thinking is an ability to deal with information on the basis of its structure and its function. Feeling is an ability to deal with information on the basis of its initial energetic condition and its interactions. The most common differences between Thinking and Feeling type are shown below:

| Thinking types | Feeling types |
|---|---|
| • are interested in systems, structures, patterns<br>• expose everything to logical analysis<br>• are relatively cold and unemotional<br>• evaluate things by intellect and right or wrong<br>• have difficulties talking about feelings<br>• do not like to clear up arguments or quarrels | • are interested in people and their feelings<br>• easily pass their own moods to others<br>• pay great attention to love and passion<br>• evaluate things by ethics and good or bad<br>• can be touchy or use emotional manipulation<br>• often give compliments to please people |

### Perceiving vs. Judging

Perceiving types are motivated into activity by the changes in a situation. Judging types are motivated into activity by their decisions resulting from the changes in a situation. The most common differences between Perceiving and Judging types are shown below:

| Perceiving types | Judging types |
|---|---|
| • act impulsively following the situation<br>• can start many things at once without finishing them properly<br>• prefer to have freedom from obligations<br>• are curious and like a fresh look at things<br>• work productivity depends on their mood<br>• often act without any preparation | • do not like to leave questions unanswered<br>• plan work ahead and tend to finish it<br>• do not like to change their decisions<br>• have relatively stable workability<br>• easily follow rules and discipline |

Researchers like Lawrence, McCaulley and Myers have investigated the relationship of Karl Jung's theory of individuals' preferences and their approach to problem solving and decision-making. Their findings are summarized below (William G. Huitt – "Problem solving and Decision Making: Consideration of Individual Differences Using the Myers-Briggs Type Indicator"):

1. When solving problems, individuals who are introverts will want to take time to think and clarify their ideas before they begin talking. They will more likely be concerned with their own understanding of important concepts and ideas.

2. Individuals who are extroverts will want to talk through their ideas in order to clarify them. They will continually seek feedback from the environment about the viability of their ideas.

3. Sensing individuals will be more likely to pay attention to facts, details, and reality. They will also tend to select standard solutions that have worked in the past.

4. Persons with intuition preferences will more likely attend to the meaningfulness of the facts, the relationships among the facts, and the possibilities of future events that can be imagined from these facts. They will exhibit a tendency to develop new, original solutions rather than to use what has worked previously.

5. Individuals with a thinking preference will tend to use logic and analysis during problem-solving. They are also likely to value objectivity and be impersonal in drawing conclusions. They want solutions to make sense in terms of the facts, models, and/or principles under consideration.

6. Individuals with a feeling preference are more likely to consider values and feelings in the problem-solving process. They will tend to be subjective in their decision-making and to consider how their decisions could affect other people.

7. People, particularly, the ‘judging’ types, are more likely to prefer structure and organization to the problems itself and will want the problem-solving process to demonstrate closure.

8. People with a perceiving preference are more likely to prefer flexibility and adaptability. They will be more concerned that the problem solving process considers a variety of techniques and provides for unforeseen changes.

Table below lists important aspects of personality when considering attention to individual differences during problem solving. Each aspect of personality has a different orientation to problem solving, different criteria for judging the effectiveness of the process and different associated strengths.

## Aspects of Personality Important for Problem-Solving

| MBTI Dimension | Orientation | Criteria for Judging Effectiveness | Strengths |
|---|---|---|---|
| **Extrovert** | Outside world of people and things | Can "talk through" problem in group<br>Works in "real world" | Attend to external reality<br>Listen to others |
| **Introvert** | Inner world of ideas | Internal logic, value of ideas<br>Want to reflect on problem | Attend to internal consistency of solutions |
| **Sensing** | Facts and details from past and present | Personal experience<br>Practicality of solutions<br>Conforms to standards | Attend to details<br>What could go wrong<br>Develop and implement specific steps of solution |
| **Intuitive** | Concepts and principles<br>Possibilities for future | Meaningfulness of facts, details<br>Solutions consider total situation<br>Prospect for originality | See connections and links<br>Develop complex solutions<br>Implications of improper solution(s)<br>Develop major phases |
| **Thinking** | Objectivity<br>Logic and reason | Solutions make sense based on facts, models, and/or principles | Attend to internal and external consistencies<br>Evaluate for efficiency and effectiveness |
| **Feeling** | Subjectivity<br>Values and affect | Solutions consider impact on people | Evaluate for impact on people<br>Evaluate in terms of valued by participants |

| | | | |
|---|---|---|---|
| **Judging** | Organization Structure and closure | Decisions are made Solution can be<br>Implemented<br>A step-by-step<br>procedure to follow | Identify possible defects<br>Follow steps during<br>Implementation<br>Evaluate for effectiveness and efficiency |
| **Perceiving** | Data gathering Processing solutions | Solutions are flexible and adaptable<br>Enough information provided in solution<br>Variety of alternatives considered | Develop complex solutions<br>Flexibility |

Source: William G. Huitt – “Problem solving and Decision Making: Consideration of Individual Differences Using the Myers-Briggs Type Indicator”

## 6 Personality Types & Problem-Solving Techniques

It is not enough to describe a problem-solving process and to describe how individuals differ in their approach to or use of it. It is also necessary to identify specific techniques of attending to individual differences. Fortunately, a variety of problem-solving techniques has been identified to accommodate individual preferences. Some of these techniques are oriented more to individuals who are more structured, more rational and analytical, and more goal-oriented in their approach to problem-solving.

Other techniques are more suited to individuals who demonstrate a preference for an approach that is more holistic and parallel, more emotional and intuitive, more creative, more visual, and more tactual/kinesthetic. It is important that techniques from both categories be selected and used in the problem-solving process. "

William G. Huitt ("Problem Solving and Decision Making: Consideration of Individual differences - Using the Myers-Briggs Type Indicator") lists out the following **sixteen problem-solving techniques**, which focus more on logic and critical thinking, especially within the context of applying the scientific approach:

**a). Means-End Analysis**: In means-ends analysis, the problem solver compares the present situation with the goal, detects a difference between them, and then searches memory for actions that are likely to reduce the difference.

**b). Backwards Planning:** The strategy of working backwards entails starting with the end results and reversing the steps you need to get those results, in order to figure out the answer to the problem.

**c). Categorizing/Classifying**: It is the process of grouping objects or events together on the basis of a logical rationale. There are two kinds of categorizing, grouping and classifying. Grouping is putting together objects on the basis of a single property. Files might be grouped on the basis of "urgent" and "not-urgent". Grouping is useful in revealing similarities and differences that otherwise might go unnoticed. Classifying

involves putting items together on the basis of more than a single property at a time.

**d). Challenging Assumptions**: It involves the direct confrontation of ideas, opinions, or attitudes that have previously been taken for granted. The purpose is to identify the fallacies, consistencies and inconsistencies in the problem-solving process.

**e). Evaluating/Judging**: It involves the comparison with a standard and making a qualitative or quantitative judgment of value or worth. Good evaluations of problem solving are generally based on multiple sources of assessment information.

**f). Inductive/Deductive Reasoning:** Reasoning is the systematic and logical development of rules or concepts from specific instances or the identification of cases based on a general principle or proposition using generalization and inference.

**g). Thinking Aloud**: It is the process of verbalizing about a problem and its solution while a partner listens in detail for errors in thinking or understanding.

**h). Network Analysis**: It is a systems approach to project planning and management where relationships among activities, events, resources, and timelines are developed and charted. Specific examples include Program Evaluation and Review Technique and Critical Path Method.

**i). Plus-Minus-Interesting (PMI)**: It involves considering the positive, negative, and interesting or thought-provoking aspects of an idea or alternative using a balance sheet grid where plus and minus refer to criteria identified in the second step of the problem-solving process.

**j) Task analysis**: It is the consideration of skills and knowledge required to learn or perform a specific task.

Now let us take a look at Huitt's list of problem-solving techniques that conform to creative, lateral, or divergent thinking. Following is the list of problem-solving techniques;

**a) Brainstorming**: It is attempting to spontaneously generate as many ideas on a

subject as possible; ideas are not critiqued during the brainstorming process; participants are encouraged to form new ideas from ideas already stated.

**b). Imaging/Visualization**: It is producing mental pictures of the total problem or specific parts of the problem.

**c). Incubation**: It is putting aside the problem and doing something else to allow the mind to unconsciously consider the problem

**d). Outcome Psychodrama**: It is enacting a scenario of alternatives or solutions through role playing.

**e). Outrageous Provocation**: It is making a statement that is known to be incorrect (e.g., the brain is made of charcoal) and then considering it; used as a bridge to a new idea.

**f). Overload**: It is considering a large number of facts and details until the logic part of the brain becomes overwhelmed and begins looking for patterns. It can also be generated by immersion in aesthetic experiences, sensitivity training or similar experiences.

**g). Random Word Technique**: It is selecting a word randomly from the dictionary and juxtaposing it with problem statement, then brainstorming about possible relationships.

**h). Relaxation**: It is systematically relaxing all muscles while repeating a personally meaningful focus word or phrase.

**i). Synthesizing**: It is combining parts or elements into a new and original pattern.

**j). Taking Another's Perspective**: It is deliberately taking another person's point of view.

**k). Value Clarification**: It is using techniques such as role playing, simulations, self-analysis exercises, and structured controversy to gain a greater understanding of attitudes and beliefs that individuals hold important. The value clarification can provide a greater goal clarity and motivation and increase an internal locus of control for managers.

Following is a table summarizing the personality types, orientations and problem-solving techniques:

**Personality Types and Preferred Problem-Solving Techniques**

| Personality Dimension | Orientation | Techniques |
|---|---|---|
| **Extrovert** | Outside world of people and things | Brainstorming Thinking aloud Outcome psychodrama |
| **Introvert** | Inner world of ideas | Brainstorming privately Incubation |
| **Sensing** | Facts and details from past and present | Share personal values, ideas facts, Overload Inductive reasoning Random word technique |
| **Intuitive** | Concepts and principles Possibilities for future | Classify, categorize, Deductive reasoning Challenge assumptions Imaging/ visualization Synthesizing |
| **Thinking** | Objectivity Logic and reason | Classify, categorize Analysis Network analysis Task analysis |
| **Feeling** | Subjectivity Values and affect | Share personal values Listen to others' values Values clarification |
| **Judging** | Organization Structure and closure | Evaluation PMI technique Backward planning Select single solution |
| **Perceiving** | Data gathering Processing solutions | Brainstorming Random word technique Outrageous provocation Taking another's perspective |

Source: William G. Huitt – "Problem solving and Decision Making: Consideration of Individual Differences Using the Myers-Briggs Type Indicator"

### How to use de Bono's 'Six Thinking Hats' to improve your thinking skills

The 'Six Thinking Hats' is a quick, simple and powerful technique to improve your thinking. It does this by encouraging you to recognize what type of thinking you are using, and to apply different types of thinking to the subject.

Sounds strange? Take two minutes to expand your thinking skills…We all use different types of thinking, usually without realizing it. For example, if we are feeling pessimistic

about the situation, that is the only type of thinking we apply! This limits our ability to see all the issues.

- **The White Hat** is cold, neutral, and objective. Take time to look at the facts and figures.
- **The Red Hat** represents anger (seeing red). Take time to listen to your emotions, your intuition.
- **The Black Hat** is gloomy and negative. Take time to look at why this will fail.
- **The Yellow Hat** is sunny and positive. Take time to be hopeful and optimistic.
- **The Green Hat** is grass, fertile and growing. Take time to be creative and cultivate new ideas.
- **The Blue Hat** is the color of the sky, high above us all. Take time to look from a higher and wider perspective to see whether you are addressing the right issue.

You can also think of the hats as pairs: **White and Red, Black and Yellow and Green and Blue**

Next time you are thinking through an issue, try on de Bono's thinking hats. You'll soon find that they give you a quick, simple, and powerful technique to improve your thinking.

## 10 Steps for Boosting Creativity

## (Jeffrey Baumgartner)

1. Listen to music by Johann Sebastian Bach. If Bach doesn't make you more creative, you should probably see your doctor - or your brain surgeon if you are also troubled by headaches, hallucinations or strange urges in the middle of the night.

2. Brainstorm. If properly carried out, brainstorming can help you not only come up with sacks full of new ideas, but can help you decide which is best.

3. Always carry a small notebook and a pen or pencil around with you. That way, if you are

struck by an idea, you can quickly note it down. Upon rereading your notes, you may discover about 90% of your ideas are daft. Don't worry, that's normal. What's important are the 10% that are brilliant.

4. If you're stuck for an idea, open a dictionary, randomly select a word and then try to formulate ideas incorporating this word. You'd be surprised how well this works. The concept is based on a simple but little known truth: freedom inhibits creativity. There are nothing like restrictions to get you thinking.

5. Define your problem. Grab a sheet of paper, electronic notebook, computer or whatever you use to make notes, and define your problem in detail. You'll probably find ideas positively spewing out once you've done this.

6. If you can't think, go for a walk. A change of atmosphere is good for you and gentle exercise helps shake up the brain cells.

7. Don't watch TV. Experiments performed by the *JPB Creative Laboratory* show that watching TV causes your brain to slowly trickle out your ears and/or nose. It's not pretty, but it happens.

8. Don't do drugs. People on drugs think they are creative. To everyone else, they seem like people on drugs.

9. Read as much as you can about everything possible. Books exercise your brain, provide inspiration and fill you with information that allows you to make creative connections easily.

10. Exercise your brain. Brains, like bodies, need exercise to keep fit. If you don't exercise your brain, it will get flabby and useless. Exercise your brain by reading a lot, talking to clever people and disagreeing with people - arguing can be a terrific way to give your brain cells a workout. But note, arguing about politics or film directors is good for you; bickering over who should clean the dishes is not.

# 7 Problem-Solving Tools

The following are some of the principal tools that enable managers to analyze and prioritize the root causes of identified problems and to assist in problem-solving activities. The tools outlined can also assist in identifying opportunities for improvement. The toolkit includes:

- Cause-and-effect diagram
- Pareto chart
- Flow Charts
- Histogram
- Check Sheet
- Scatter diagram
- Brain Storming

## 1. Cause-and-Effect Diagram

Cause and Effect relationships govern everything that happens and as such are the paths to effective problem-solving. By knowing the causes, one can find factors that are within one's control and then change or modify them to meet one's goals and objectives. By understanding the nature of the cause and effect principle, one can build a diagram that helps to solve everyday problems every time.

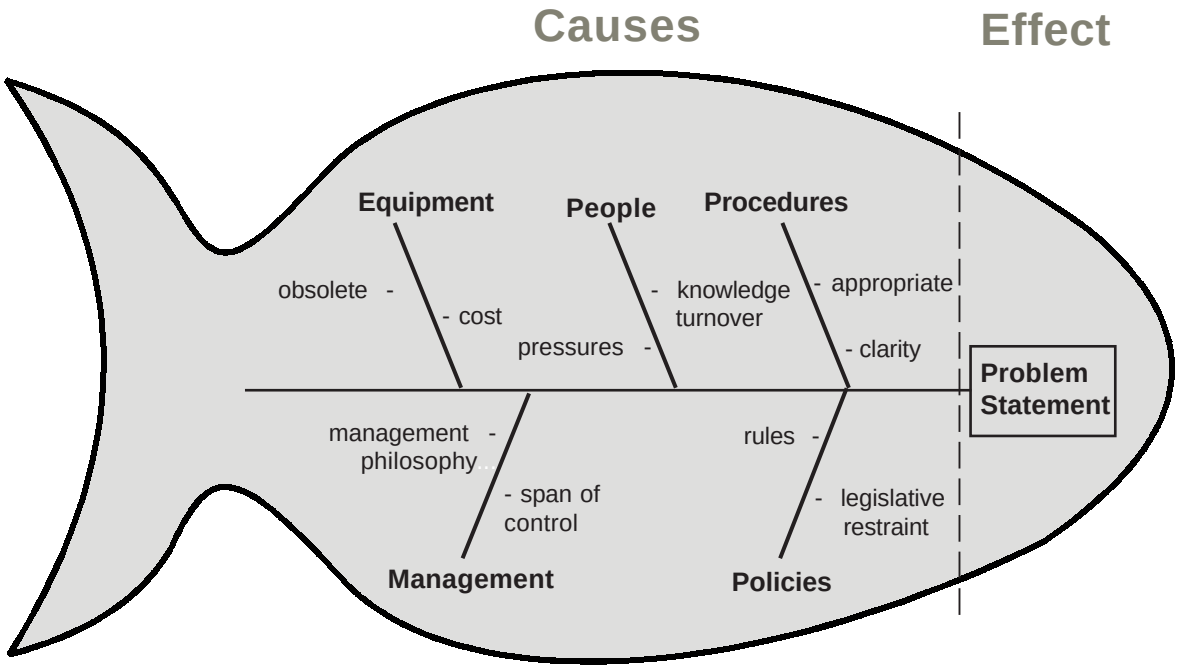
The Cause-and-Effect Diagram helps to identify all the possible factors causing a specific problem. Also known as **Ishikawa** or **Fishbone** diagram, it resembles the skeleton of a fish. The problem statement is represented as the fish's head. The purpose of the cause-and-effect diagram is to identify probable causes of the problem statement summarized in the box at the fish's head.

A straight line extends out from the fish's head, or the problem statement. Diagonal lines are then connected to the straight line, each of which represents one of the major causes of the problem. Additional lines are then added to the diagonal lines, breaking the major area down into smaller areas. More lines are added until finally, at the lowest level, individual root causes of the problem are identified.

The four steps in constructing a cause-and-effect diagram are mentioned below:

1. Determine a problem statement and categorize four or five possible causes of the problem. Major categories of causes include policies, procedures, people, equipment, work environment, measurement, management or money. Use any category that fits the situation and helps people think creatively.

2. Construct a cause-and-effect diagram. Place the problem in a box on the right side of a flip-chart page and draw a horizontal line (the fish's "spine") leftward from the box.




List two to three major causes in the categories above the horizontal line and a similar number below, connecting them with lines (the fish's "bones") to the "spine."

3. Conduct a brainstorming session to determine the specific factors the team believes to be causes of the problem in question; as these factors are identified, list them under their appropriate major category.

4. After all ideas are presented and understood, the group identifies the most likely causes (either by voting or group discussion). Causes, that are quantifiable, should be measured. This will provide a basis for prioritizing the causes.

## 2. Pareto Chart

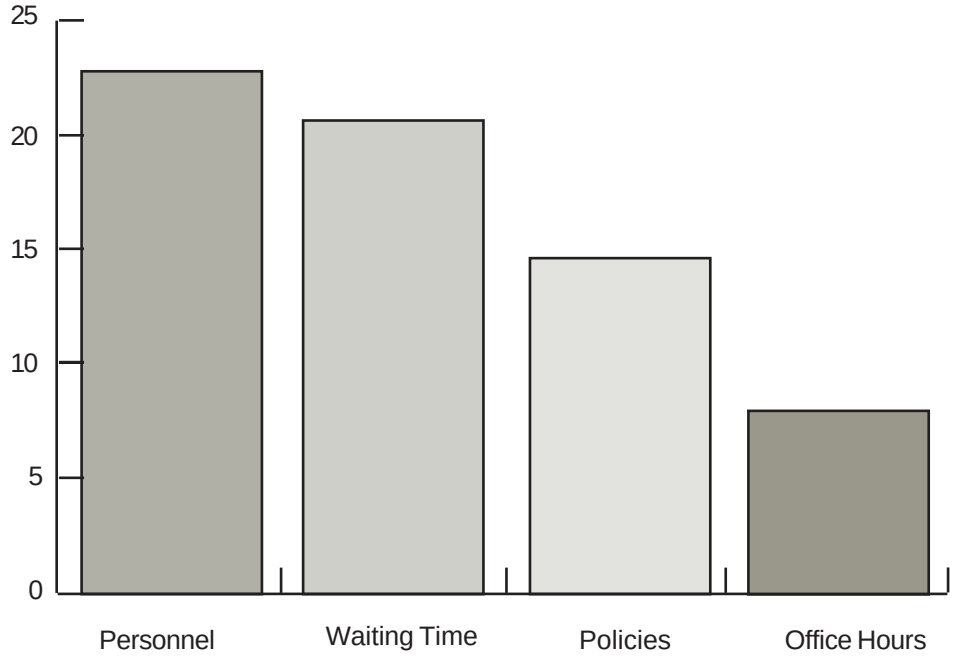
A Pareto chart (named after the 19th-century economist who devised this type of analysis) is a vertical bar graph used to determine the most serious of a group of problems, so that priorities may be set. This analysis is based on the assumption that problems have different levels of importance, and that organizations always face more problems than their time and resources can address. Pareto analysis is responsible for the famous “80/20” doctrine, a rule of thumb that holds that about 80 percent of the problems in any organization are created by 20 percent of its employees. The review can focus on the most vital problems by using a Pareto chart.

Suppose an organization is suspect to take too much time to issue permits. Then, it is necessary to identify problems causing this delay and correct the most significant ones. Studying the problem may indicate that the highest number of delays occur because of incorrectly completed applications. Now the review can focus on improving the accuracy of applications to resolve the most significant reason for delays. This is the sort of judgment facilitated by Pareto charting.

To construct a Pareto chart:

1. Select the issues or causes to be ranked.
2. Select a measure for comparison, typically frequency (number of occurrences) or cost. If you do not have a direct measure for a cause or problem, try using a percentage.
3. List the issues or causes from left to right on the horizontal axis in order of decreasing frequency or cost.
4. Analyze the chart and choose the most significant issues for review.

**Number of Complaints from January - March 1993**




## 3. Flow Charts

Flow charts are analytical tools commonly used to identify problems. They illustrate the flow of an activity, a process or a set of interrelated decisions or communications from beginning to end.

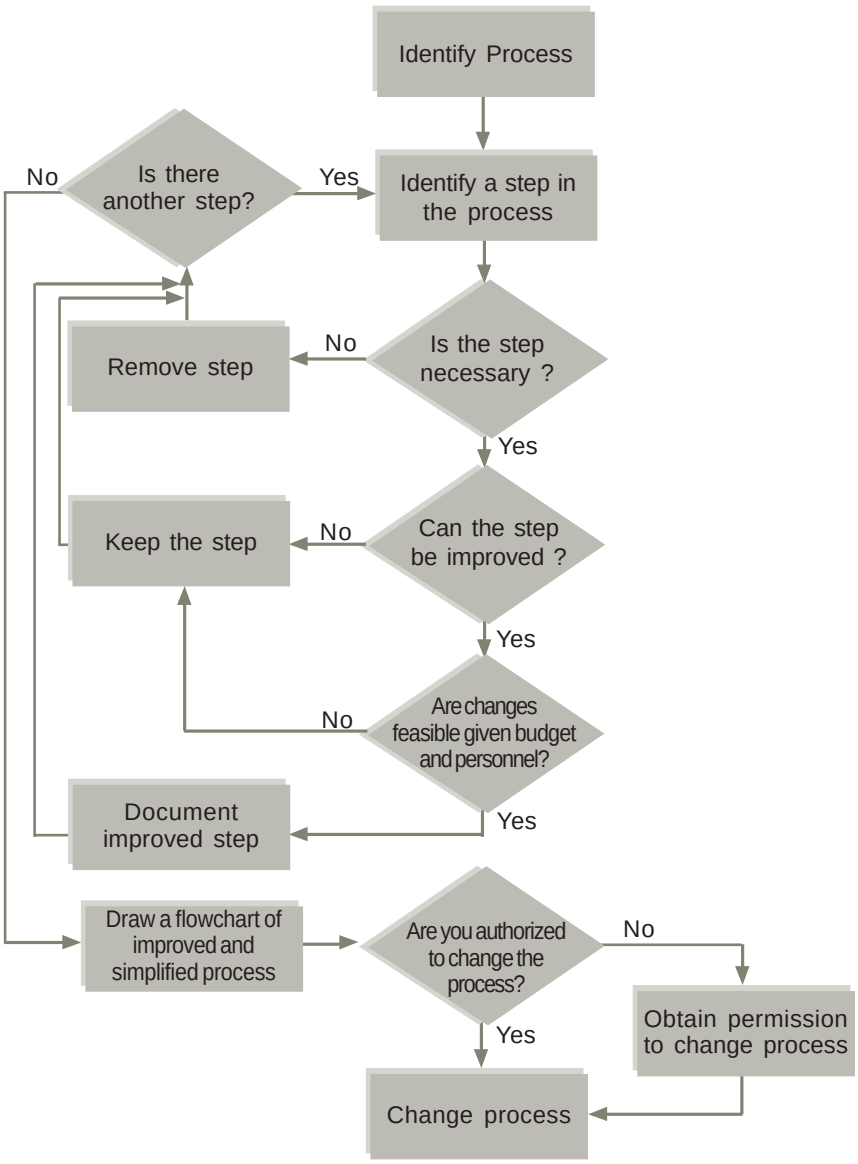
Flow charts can be applied to anything from the processing of a tax return to the flow of materials in a manufacturing process. The major benefit of flow charting is that the process forces analysts to understand all the steps of a process and to ask questions about the sequence of events in a process.

Flow charts are prepared from information gathered through interviews or observations. If an organization under review has already prepared a flow chart of an activity, verify the steps involved. Activities should be shown in sequence and significant time lapses during and between processes should be noted. It is best to use common, agreed-upon flow chart symbols so that the work will be readily recognizable to team members.

The layout of a flow chart can be either vertical or horizontal. After the chart has been drafted, its contents should be reviewed by those who provided the information involved. This review will often produce modifications to the flow chart. Once the chart's accuracy is verified, the analyst is ready to analyze the process it portrays.

In this analysis, look for duplicated activities, activities that should be performed but aren't, unnecessary activities, misuse of time and any unusual occurrences. For example, look for any obvious bottlenecks in the process, anything that interrupts the orderly and efficient use of personne resources to produce the desired end.

## QUALITY MANAGEMENT PROCESS FLOW CHART

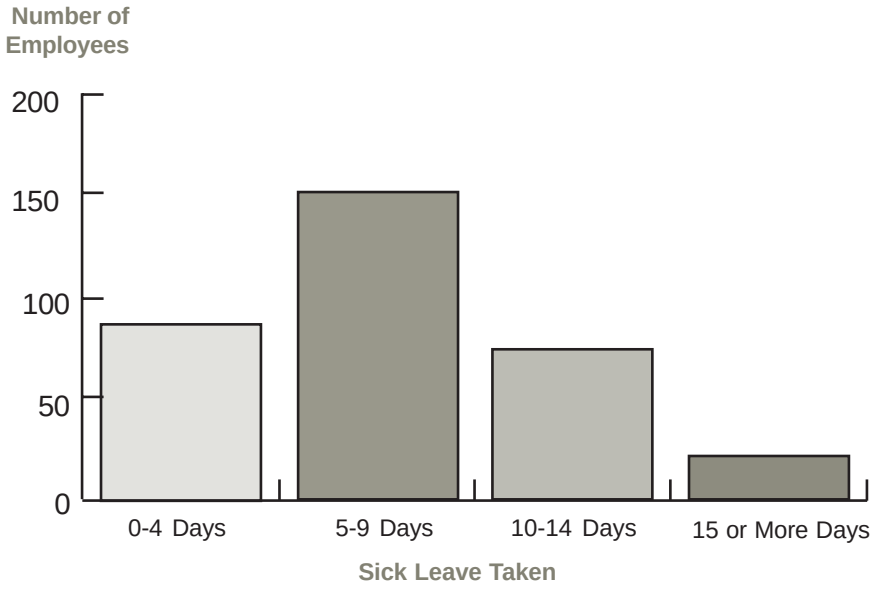


## 4. Histograms

A histogram is a bar chart mainly used to show the frequency of certain activities. In a histogram, the horizontal axis signifies some quality being measured, while the vertical axis measures frequency. For example, an analyst could use a histogram to chart employee use of sick leave. To construct a histogram for this purpose:

1. Gather data.
2. Divide the data into manageable categories. The number of categories (the bars in the graph) will determine how much of a pattern will be visible. For example, appropriate categories might be zero to four days' leave used per year, five to nine days' leave per year, 10 to 14 days' leave per year and 15 or more sick days used per year.
3. Construct the histogram based on your data, with the vertical axis representing frequency, and in this case, the number of employees. The horizontal axis would represent the categories of leave used as established above.
4. Analyze the histogram to determine whether employee sick-leave patterns seem unusual or problematic.

**Employee Sick Leave for FY 1993**




## 6. Check Sheet

A check sheet is used to compile, summarize and track observations, interview results or other data. It can help translate opinions into facts by showing how often an event occurs or the amount of time an activity requires.

Visually, a check sheet is simply a series of rows and columns denoting activities and categories. Creating one involves the following steps:

1. Determine the activity you wish to track.
2. Design a form that is clear and easy to use, making sure that all columns are clearly labelled, with enough space to enter the data.
3. Record the data on the form in a consistent manner.
4. Analyze the data.

### Check Sheet of Complaints by Field Offices

| | Location of Offices | | | |
|---|---|---|---|---|
| **Type of Complaints** | Austin | Houston | Dallas | Total |
| Personnel | 𝍸 𝍸 \|\| | 𝍸 𝍸 | \|\|\|\|\|\|\|\|\|\| | 24 |
| Policies | \|\|\| | 𝍸 𝍸 \|\|\| | \|\|\|\| | 15 |
| Wating Time | \|\|\|\| | 𝍸 𝍸 \|\|\| | 𝍸 𝍸 \|\|\|\| | 21 |
| Office Hours | \|\| | \| | \|\|\|\| | 7 |
| Total | 16 | 21 | 28 | 67 |

Data collected from January through March of 2000

### 7. Scatter Diagram

The scatter diagram is another tool for determining cause-and-effect relationships. A scatter diagram charts two variables on vertical and horizontal axes to determine whether there is a relationship between them—typically, whether one variable is a cause of the other.

An example of a use for the scatter diagram could be an analysis of the relationship of overtime to processing errors among workers. To create a scatter diagram:

1. Collect the data and construct a data table. For the example cited above, the overtime hours worked and errors made over a given time period for a selected group of employees may be assembled.

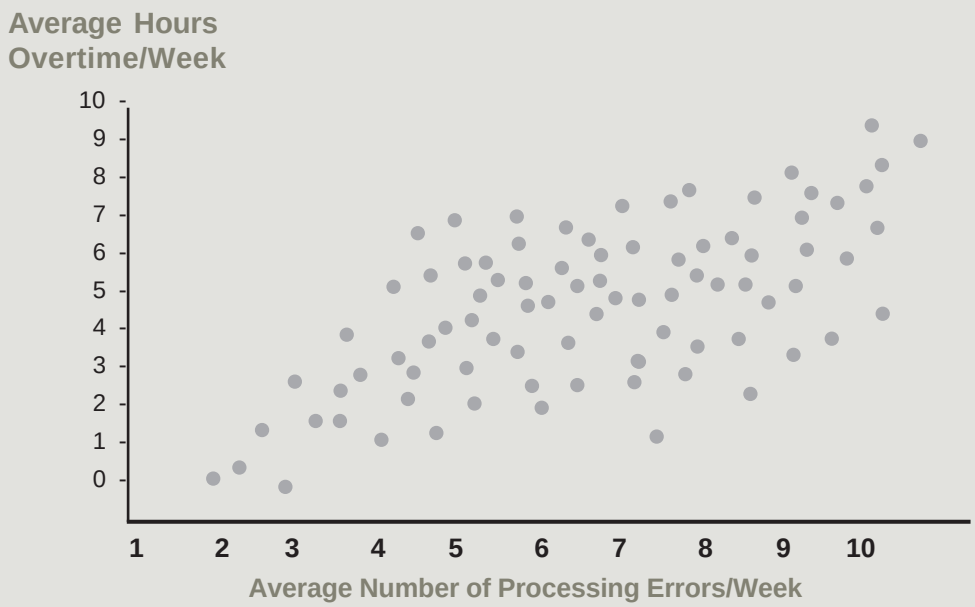
2. Draw the horizontal and vertical axes of your diagram, with values rising as the reader moves up and to the right. Place the possible “cause” variable on the horizontal axis (in this case, overtime worked) and the “effect” variable on the vertical axis (the number of errors made).

3. Plot the data on the diagram.

Interpret the diagram. A cause-effect relationship is indicated if the plotted points form a clustered pattern. The direction and tightness of this cluster determines the relationship between the two variables. The more the cluster resembles a straight line, the stronger the relationship between the variables. If the cluster rises diagonally to the right, the suspected factor appears to be a cause of the problem. If the cluster falls diagonally, the suspected cause actually appears to discourage or suppress the problem. If the data points are scattered over the whole diagram, no correlation between variables is indicated.

**Exhibit 4 : Scatter diagram**

**Relationship of Overtime to Processing Errors**




## 8. Brainstorming

“Brainstorming” is a technique for generating useful ideas through open, freewheeling discussion among team members. Brainstorming is intended to expand available alternatives, look beyond obvious solutions, encourage innovation, shift points of view, challenge tradition, reduce inhibitions and tap the team’s creative resources.

The three basic brainstorming methods include:

i) the unstructured approach in which everyone contributes ideas spontaneously, with a designated scribe or “facilitator” recording them;

ii) a structured format, in which each team member takes a turn at presenting ideas; and

iii) a written, or “pen-and-paper” method, in which participants record their ideas on slips of paper and submit them to a facilitator or team leader.

After choosing an appropriate brainstorming method, the team leader should state a problem or discussion topic. This topic or problem should be clear and concise. Place the statement on a flip chart so everyone can refer to it and then solicit ideas from the group members.

Some tips for successful brainstorming include:

i) Never criticize or evaluate an idea when it is first presented, and record all ideas;

ii) appoint a good facilitator to ensure that everyone participates and that questions that need to be asked are actually addressed;

iii) keep the setting informal;

iv) encourage offbeat and unconventional ideas;

v) combine and build on ideas, and move quickly from one member to the next.

The brainstorming session is complete when all the participants’ ideas are recorded.

After all ideas are recorded, select the most fruitful alternatives, either by having participants vote for the best ideas or by reaching consensus through discussion. The top choices should be discussed in detail. Try listing each idea’s advantages and disadvantages.

## Additional Tools of Problem-Solving

### 1. The APC tool For Problem-Solving

APC stands for:

- Alternatives
- Possibilities
- Choices

The three words are close in meaning, although one or more may be more appropriate in a given situation.

Doing an APC means thinking of alternatives, or different approaches then, with these multiple choices before us, we can select what seems to be the best solution.

Generating alternatives opens up possibilities. It requires special mental effort as the human brain naturally looks for patterns and certainty rather than alternatives.

That is why a thinking tool such as APC forces the mind into new directions, into actually focusing, concentrating on alternatives.

### 2. “The Ideal Solution Method”

In this method the alternatives are listed and then ignored. Instead, an ‘ideal solution’ is fashioned for the situation.

Once that is considered, the list of alternatives can be consulted again to see which one of them comes nearest to the ‘ideal solution’.

So the alternatives are now considered not on their own individual merit but according to how close they come to the ‘ideal’.

### 3. The TEC Framework

- T stands for Target
- E stands for Expand and Explore
- C stands for Contract and Conclude

This framework can be put into a time-limited 5-minute problem-solving session.

Spend 1 minute on Target and Task: The target is the precise focus of the thinking and the task is the thinking task to be performed.

Spend 2 minutes on Expand and Explore: Open up the phrase, explore the territory, pull in information and concepts.

Spend 2 minutes on Contract and Conclude: Try to make sense of when you have come to a definite conclusion or solution.

By strictly timing ourselves according to this framework the mind really focuses and produces results!

## PROBLEM SOVING WORKSHEET

Problem Solving Skills Worksheet Name : _____

Problem _____ Date _____

| **IDENTIFYING** Circle your response to these questions | Identifying the Nature of an Open-Ended Problem and Related Information Write your thoughts and feelings here |
|---|---|
| A. Did you identify important information that might be helpful in thinking about this problem ?<br><br>No Week Yes Strong Yes | List source(s) of information : |
| B. Did you identify different opinions about the best way to deal with this problem ?<br><br>No Week Yes Strong Yes | Why are there different opinions ? In other words, what uneertuinties are there about the information related to this problem ? |
| **FRAMING** Circle your response to these questions | **RESOLVING** an Open-Ended Problem Write your thoughts and feelings here |
| C. Did you think about the problem beyond your first impression ?<br><br>No Week Yes Strong Yes | Explain your first impression.<br><br>What are some strong points or benefits of each possible solutions ? |
| D. Did you think about how others could look at information about this problem differently ?<br><br>No Week Yes Strong Yes | Give some examples |

## PROBLEM SOVING WORKSHEET

Problem Solving Skills Worksheet

Name : _____

Problem _____

Date _____

| **RESOLVINGS** Circle your response to these questions | **RESOLVING** an Open-Ended Problem<br>Write your thoughts and feelings here |
|---|---|
| E. Can you explain how you decided what was most important in solving this problem ?<br><br>No Week Yes Strong Yes | Explain |
| F. In coming to your solution, did you carefully consider more than one opinion or solution ?<br><br>No Week Yes Strong Yes | Explain |
| **RE-ADDRESSING** Circle your response to these questions | **RE-ADDRESSING** an Open-Ended Problem<br>Write your thoughts and feelings here |
| G. Have you thought about what you learned as you worked on this problem ?<br><br>No Week Yes Strong Yes | What have you learned about this kind of problem ? |
| H. Have you considered what you need to do next related to this problem ?<br><br>No Week Yes Strong Yes | What are your next steps ?<br><br>What other questions do you have ? |

## What's Your Problem-Solving Style?

Directions: Circle the correct letter, then distribute the 11 points among choices a, b and c.

For example: a: 8, b: 2, c: 1

1. When I am faced with a complex situation or problem, I tend to:

_____ a. Ask friends

_____ b. Solve it myself

_____ c. Seek professional help

2. People who are great problem solvers:

_____ a. Have very clear goals and objectives

_____ b. Find the best solution

_____ c. Ask the right questions

3. I am happiest when I am deciding:

_____ a. How things should be

_____ b. How to make things better

_____ c. How things are now

4. When I am bothered by something I look at:

_____ a. How I would like things to be different

_____ b. What I should do to make things better

_____ c. The cause of the problem

5. When I am under pressure, I

_____ a. Spend a lot of time thinking about it

_____ b. Solve it quickly

_____ c. Sit back and carefully examine the situation

6. I am most interested in:

_____ a. The way things could be

_____ b. How to improve things

_____ c. The way things are now

8. When I am in a group, I tend to help the group:

_____ a. Determine goals

_____ b. Take action

_____ c. Obtain the facts

9. When I find out that another person does not like me or is angry with me, I:

_____ a. Try to understand what that person wants

_____ b. Try to make things better between us

_____ c. Get more information

10. When another person asks me for help with a problem, I tend to:

_____ a. Find out what the person wants to accomplish

_____ b. Give suggestions

_____ c. Get more information

11. People in general are likely to get into trouble when they:

_____ a. Lack a vision for the future

_____ b. Don't take risks

_____ c. Act on impulse

Add the numbers you have written.

*Totals:*

A: _____

B: _____

C: _____

Now add 5 points to A and subtract 5 points from C.

A: _____

B: _____

C: _____

A= Idealist interested in values

B= Activist interested in proposals and ideas

C= Realist interested in information and situations

## Suggested Readings

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