

PROBLEM SOLVING AND DECISION MAKING

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Abstract

Problem solving is a key skill, and its one that can make a huge difference to our careers. At work, problems are at the centre of what many people do every day. Supporting those who are solving problems, or discovering new problems to solve. Problems are always bound to occur in a business, regardless of the nature of the problems, a fundamental part of every manager's role is finding ways to solve them. While decision making usually need a simple decision-making process.

1.0 Introduction

The importance of and the need for complete problem solving and decision making

In Research Briefings (1986), Nobel Laureate Herbert Simon (father of Artificial Intelligence) states: The work of managers, of scientists, of engineers, of lawyers – the work that steers the course of society and its economic and government organisations – is largely work of making decisions and solving problems. It is work of choosing issues that require attention, setting goals, finding or designing suitable courses of action, and evaluating and choosing among alternative actions.

The first 3 activities

- Fixing agendas
- Setting goals - problem solving
- Designing actions

The last 2

- Evaluating and
- Choosing - Decision Making

Important for the wellbeing of society that this work be performed effectively to address successfully the many problems at all levels.

- Better problem solving and decision making by managers can greatly Improve an organisation's effectiveness and goals attainment...
- Studies show that managers and leaders do not achieve much over 50% correct results in their decision making and problem solving...
- This percentage is worrisomely low

1.1 Decision Making in Management

- Decision making is fundamental in management
- Management is the practice of consciously and continually shaping formal organisations, and the art of decision making is central to doing that

Identifying and selecting a course of action to deal with a specific problem or take advantage of an opportunity – is an important part of every manager's job. We all make decisions, of course. What sets the practice of management apart is the systematic, specialised attention that managers give to decision making.

1.2 Intuitive Decision Making

- We make hundreds of decisions and solve many problems daily, usually based on: Intuition
- Otherwise called instantaneous decisions, gut feelings, leaps of understanding, hunches, sixth sense, quick guesses, etc.
- Many intuitive thoughts may be important, so too many errors of intuition can hurt.

- Intuitive Decision vs Analytical Decision – which is best?

1.3 Your Intuitive base or brain skill

A good intuitive base depends on a great number of things, such as:

- Curiosity * A good memory
- Emotional * Freedom from biases
- Body of knowledge * Memories of experience
- Creative ability * Accurate interpretation of experiences
- Ability to distinguish between relevant and irrelevant concepts
- Good reasoning and analytical ability

Note: The above attributes also describe a person with wisdom as well as good judgement.

1.4 Problem and Opportunity Finding

- Decision making deals with problems. A problem arises when an actual state of affairs differs from a desired state of affairs
- Arguably, managers face many problems and opportunities, but how do effective managers recognise both problems and opportunities?

1.5 Problem Finding Process

Four situations usually alert managers to possible problems

1. A deviation from past experience – previous pattern of performance has been broken
2. A deviation from a set plan – manager's projections or expectations are not being met
3. Other people often bring problems to the managers – customers complains, employees resign

4. The performance of competitors – other companies develop new process or progress.

1.6 Critical Thinking

Critical thinking is defined as that mode of thinking – about any subject, content, or problem – in which the thinker improves the quality of his or her thinking by skilfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them.

Critical thinking aid creativity and improve decision making

Critical thinking is the thought process of selecting a logical choice from among the available options involve:

- Weighting the positives and negatives of each option
- Considering all the alternatives
- Be able to forecast the outcome of each option
- Determine which option is the best for that particular situation

Critical Thinking using Edward de Bono's DATT – Direct Attention Thinking Tools

DATT is a critical thinking framework with a set of 10 thinking tools, that when combined into thinking patterns allows for highly effective thinking and decision making by individuals and groups. DATT has been used for more than 40 years around the world.

1.7 DATT – Direct Attention Thinking Tool

Edward de Bono's Direct Attention Thinking Tools – Think in steps, think more comprehensively

- Tool to help guide and change perception
- Evaluates ideas thoroughly and objectively
- Target your thinking at specific areas

Direct Attention Thinking Tools to help you think thoroughly about issues.

1. AGO – Aims, Goals and Objectives – ensure that the long, medium and short term goals are

clarified and considered during the thinking and in decision making.

2. FIP – First Important Priorities – has two valuable applications. At the beginning of the thinking it aids in separating and prioritizing issues – what must be done first, what depends on what, where do the priorities lie? And later when planning decision implementation it is applied again to set the order of action steps.
3. RAD – Recognise Analyse Divide – aids in understanding a challenge so an approach to resolving it can be better mapped out.
4. Consider All Factors – all excellent tool to thoroughly gather all relevant information on an issue – vital to good analysis. By understanding the categories of factors involved in an issue, and identifying all the specifics within each category, the thinking is enhanced, options opened up, and decision making is more robust.
5. OPV – Other People’s View – first, how do different stakeholders see the problem? While developing ideas to solve a problem, consider each potential solution from the standpoint of other people impacted by it. Lastly when implementing chosen solutions do an OPV to clarify the role and impact the decision will have on others involved. How often have decision been made that have negatively impacted others.
6. C & S – Consequence and Sequel – has value at different stages of the critical thinking process. Could do a C & S to assess what might transpire if the issue is left unattended. To consider the impact they might have over the short, medium and long term.
7. APC – Alternatives Possibilities Choices can be used in a number of ways. To resolve issues quickly when time, resources and information are limited an APC ensures that options are considered, rather than jumping to obvious ‘fixes’. A tool for robust ideas generation.
8. PMI – Plus Minus Interesting allows much more than a simple weighing up of positives and negatives, which is often limited, what is working, of value, and still strong; what is not working, is wasteful, or is weakening the process and, the best part of PMI is to look at what is interesting – what is unusual, strange or stands-out; what would be interesting to know.
9. KVI – Key Values Involved is perhaps the most important of all. After all the analysis and consideration of pulses, minuses, consequences and sequels, alternatives, possibilities and choices, it all comes down to values. What do the stakeholders value the most?
10. DOCA – Decision/Design Outcome Channel Actions – a fantastic tool, useful or the end of a critical thinking process. Often individuals and teams undertake considerable thinking only to be let down by a lack of action at the end. Sometimes decisions are even made, but never get implemented – how much time do we see wasted in meeting every day?
 - a. DOCA is a staged tool – first we ask if a Decision has been made or a Design agreed?
 - b. Identify what outcome has been reached
 - c. Explore what needs to be done to progress it, involves identifying the channels a decision might need to follow to be successfully implemented. (Too often decisions are made and not implemented because of unanticipated blocks).
 - d. Does a decision or design need to be reviewed and approved by any internal or external parties (regulators, finance, IT, Audit, Board, etc)

Using the DATT framework is a perfect example of how the thinker improves the quality of his or her thinking by skilfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them’.

1.8 Problem solving Skills

- “Problems are only opportunities in work clothes.” – Henry Kaiser (American Industrialist)

Problem solving is a key skill, and its one that can make a huge difference to your career. At work, problems are at the centre of what many people do every day. You’re either solving a problem for a client (internal or external), supporting those who are solving problems, or discovering new problems to solve.

- Problems are always bound to occur in a business --- Regardless of the nature of the problems, a fundamental part of every manager’s role is finding ways to solve them. So, being a confident problem solver is really important to your success.
- You will always need a good problem solving process
- There are several problem solving models for example the Min Basadur Simplex Process

1.9 Simplex Problem-Solving Model

- When you’re solving business problems, it’s all-too-easy to skip over important steps in the problem-solving process, 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 the Simplex Process. This powerful step-by-step tool helps you identify and solve problems creatively and effectively.
- This model is suitable for problems and projects of any scale. It uses the eight stages shown on the next slide

- 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.

2.0 Five Basic Steps in Problem Solving

- Defining the problem
- Understanding the problem environment/complexities
- Generating alternative solutions
- Evaluating alternatives solutions (Analysing risks, hidden assumptions and unexpected impacts)
- Selecting a solutions (Decision Making)

2.1 Defining the Problem

Often, finding the right problem to solve is the most difficult part of the creative process. A very significant part of this involves making sense of the complex situation in which the problem occurs, so that you can pinpoint exactly what the problem is. The key to a good problem definition is ensuring that you deal with the real problem. When problems exist, you have opportunities for change and improvement. This makes problem finding a valuable skill. Ask questions and ask questions. Useful tools: like 5 whys, appreciation, drill down and root cause analysis.

Toolbox 1

- 5-whys – Helps to get to the root of a problem quickly; looking at a problem, ask: “why – what caused this problem,” followed by series of whys as you drill deeper into the cause of the problem.

- Appreciation – Understanding the full implication of a fact; used for extracting the maximum amount of information possible from a simple fact or statement; involves asking the “So=what” questions.
- Root Cause Analysis – Tracing a problem to its origin; help avoid treating symptoms while the problem persist; look for 3 basic type of causes – physical, human or organisational (process)
- Drill Down – This would help you split your problem into smaller parts, each of which can then be solved appropriately.

2.2 Understanding Environment and complexities

- Research the problem as fully as possible. 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
- Create a clear visual representation of the situation, so that you can better understand the “what, when, why, whom, where and how” if the problem.
- Identify the exact problem or problems that you want to solve. Big problems are normally made up of many smaller ones.
- Useful tools: like SWOT Analysis, value chain analysis, flow charts, pest analysis and porter’s five forces.

Tool Box 2

SWOT Analysis: enable you think about

- What strengths and opportunities can you build upon to come up with a solution
- What weaknesses or threats are there to address/counter when you evaluate and eventually choose a solution

PEST Analysis: helps you understand the fundamental forces behind the problem – political, economic, socio-cultural and technological.

Porter’s Five Forces:

- An analysis of supplier power, customer power, threat of substitution, ease of new entry, and competitive rivalry
- Allows you to see where power lies in the situation;
- Fundamental to understanding what to expect from others

2.3 Generating Alternative Solutions

Generate as many problem-solving ideas as possible. Ways of doing this range from asking other people for their opinions, through programmed creativity tools and lateral thinking techniques, to brainstorming. Organise the ideas – many ideas are likely to be different versions of the same basic concept. Use affinity diagram to help you group the ideas and show how to create relationships between them – leads to further insight into the problem by revealing hidden linkages which may lead to some great new alternatives not initially identified.

Useful tools: Brain-storming, reverse brain-storming, scamper affinity diagram, Delphi method

Tool Box 3

- Affinity Diagrams: great for organising many different pieces of information into common themes, and for discovering relationships between them.
- Brain-Storming: useful when you need to break out of state, established patterns of thinking in order to develop new ways of looking at things
- Reverse Brain-Storming: Think of how to cause the problem and list ways of making the situation worse; then change each cause to a

solution by adding “Don’t” to the beginning of each.

- SCAMPER: can encourage lateral thinking that stimulates fresh perspectives; prompts you to develop a solution by substituting, combining, adapting, modifying, putting to another use, eliminating, or reversing elements of the existing situation.

2.4 Evaluating Alternatives

- Testing the ideas to make sure they are sound
- Once you have a number of possible solutions to your problem, it’s time to select the best one.
- The best solution may be obvious... if it’s not, then it’s important to think through the criteria that you’ll use to select the best idea.
- Involves understanding the risks involved in each alternative, checking that the assumptions behind them are sound as well as realistic, and projecting the likely outcomes of the change to make sure there are no serious negative consequences.
- Useful tools: Risk Analysis, failure mode effect analysis (FMEA), ladder of inference and impact analysis.

Tool Box 4

2.5 Risk Analysis

- Risk – probability of event x cost of event
- Helps you decide which risk are worth taking and determine how you will manage the risk
- Help sieve out the highly risky alternatives

2.6 Failure Mode Effect Analysis

- Helps you systematically identify all the points at which a solution could fail, how likely is the failure to occur, how severe the failure might be, and what is the mitigant

2.7 Impact Analysis

- A structured method for looking in detail at the positive and negative consequences of a solution
- Help spot in advance the “unexpected consequences of a decision that can cause so much pain.

2.8 Selecting the Best Solution

- Where all the preparatory work sees a payoff – at this point there is high confidence that the solutions evaluated are appropriate, i.e.
 - They can solve the real problem
 - They are consistent with the strategic direction of the organisation
- Which of the solutions offer the greatest benefit or the least cost
- Useful tools for selecting the best alternative: cash Flow Analysis, Financial Returns Analysis (IRR or NPV), Decision Tree Analysis, The Delphi Technique, six thinking hats, paired comparison analysis.

Tool Box 5

Paired Comparison Analysis

- Usually there are a number of factors that need to be taken into account when you are choosing between several alternatives; cost, impact, timing, style, ease of access to resources, etc.
- PCA is a powerful tool for assessing the relative importance of each and helping you identify the best solution.

The Delphi Technique

- Works through a number of cycles of anonymous written discussions and arguments, especially amongst experts, managed by a facilitator.
- Participants in the process do not meet, or even necessarily know who else is involved

- The facilitator controls the process, and manages the flow and consolidation of information
- The anonymity and remoteness of the process helps to avoid issues of groupthink and personality conflicts.

Edward de Bono's Six Thinking Hats:

- Framework to help think clearly and thoroughly
- Direct thinking attention in one direction at a time.
- Facilitate focused parallel thinking in a group setting
- Allow for each point of view
- Thinking becomes more thorough
- Time-tested, proven and practical.

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|------------|---|--|
| Blue Hat | = | Organising the thinking process |
| White Hat | = | facts of the Matter – information and data |
| Green Hat | = | creativity, Ideas, possibilities |
| Black Hat | = | Difficulties, dangers, weaknesses |
| Yellow Hat | = | Being positive, logical reasons, plus points |
| Red Hat | = | Feelings, intuitions, hunches |

2.9 Decision Making Skills

How to make good decisions

Simple decisions usually need a simple decision-making process. But difficult decisions typically involve issues like these:

- Uncertainty – Many facts may not be known
- Complexity – You have to consider many interrelated factors
- High-risk Consequences – The impact of the decision may be significant
- Alternatives – Each has its own set of uncertainties and consequences
- Interpersonal Issues – It can be difficult to predict how other people will react

3.0 A Systematic Approach to Decision-Making

A logical and systematic decision-making process helps you address the critical elements that result in a good decision. By taking an organised approach, you're less likely to miss important factors, and you can build on the approach to make your decisions better and better.

There are six steps to making an effective decision:

- Create a constructive environment
- Generate good alternatives
- Explore these alternatives
- Choose the best alternative
- Check your decision
- Communicate your decision, and take action

1. Create a constructive environment

Do the following:

- Establish the objective – Define what you want to achieve
- Agree on the process – know how the final decision will be made, individual or a team-based decision
- Involve the right people – Stakeholder Analysis is important-consult stakeholders appropriately even if you're making an individual decision.
- Allow opinions to be heard – Encourage participants to contribute to the discussions, debates, and analysis without any fear of rejection from the group.
- Make sure you're asking the right question – Ask yourself whether this is really the true issue
- Use creativity tools from the start – The basis of creativity is thinking from a different perspective. Do this when you first set out the problem, and then continue it while generating alternatives.

2. Generate Good Alternatives

- The more good options you consider, the more comprehensive your final decision will be.

- Forces you to dig deeper, and look at the problem from different angles
- Key tools and techniques:
 - To generate good ideas – Brainstorming is arguably the most popular method. Consider reverse brainstorming
 - For considering different perspectives – reframing matrix uses 4 Ps (product, planning, potential and people) as the basis for gathering different perspectives
 - To organising ideas, especially when you have a large number of ideas use Affinity Diagrams to organise ideas into common themes and groupings.
 - Sometimes separate ideas can be combined into one comprehensive alternative.

3. *Explore the Alternatives*

Evaluate the feasibility, risks, and implications of each choice

- Risk: There's usually some degree of uncertainty, which inevitably leads to risk. By evaluating the risk involved with various options, you can determine whether the risk is manageable.
- Implications: Another way to look at your options is by considering the potential consequences of each
 - Six Thinking Hats helps you evaluate the consequences of a decision by looking at the alternatives from six different perspectives.
 - Impact Analysis is a useful technique for brainstorming the unexpected consequences that may arise from a decision.
- Validation: Determine if resources are adequate, if the solution matches your objectives and if the decision is likely to work in the long term.

4. *Choose the Best Alternatives*

After evaluating the alternatives, the next step is to choose between them. The choice may be obvious. However, if it isn't, these tools will help:

- Grid Analysis, also known as a decision matrix, is a key tool for this type of evaluation. It's invaluable because it helps you bring disparate factors into your decision-making process in a reliable and rigorous way.
- Use paired comparison Analysis to determine the relative importance of various factors. This helps you compare unlike factors, and decide which ones should carry the most weight in your decision.
- Decision Trees are also useful in choosing between options. These help you lay out the different options open to you, and bring the likelihood of project success or failure into the decision making process.

5. *Check Your Decision*

Look at the decision you're about to make dispassionately: has your process been thorough? Could common errors – (over-confidence, group think) have crept into the decision-making process.

- First use your intuition i.e. quietly and methodically test the assumptions and the decisions you've made against your own experience, and thoroughly reviewing and exploring any doubts you might have.
- Secondly use techniques like Blindsight Analysis to review whether common decision-making problems like over-confidence, escalating commitment, or groupthink may have undermined the decision-making process.
- Thirdly use techniques like the Ladder of inference to check through the logical structure of the decision with a view to ensuring that a well-founded and consistent decision emerges at the end of the decision-making process.

6. *Communicate your Decision, and Move to Action*

Once you've made your decision, it's important to explain it to those affected by it, and involved in implementing it. Talk about why you chose the alternative you did. The more information you provide

about risks and projected benefits, the more likely people are to support the decision.

Conclusion

Identifying and selecting a course of action to deal with a specific problem or take advantage of an opportunity is an important part of every manager's job. We all make decisions, of course. What sets the practice of management apart is the systematic, specialised attention that managers give to decision making.

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