Thinking Skills

Using Your Brain in the Information Age

Eric Garner

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ISBN 978-87-7681-966-8

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Preface

Introduction to Thinking Skills

Thinking Skills are some of the most valuable skills you can learn today. The reason is simple. While in the past, people went to work for their manual skills, today they go to work for their mental skills. We live in an Information Age, no longer an Industrial Age. That's why brain has replaced brawn, and strength in thinking has replaced strength in muscles. No matter what kind of business you work for, nor what kind of job you do, today you are expected to apply a range of thinking skills to the work you carry out. This includes using your judgment; collecting, using, and analyzing information; working with others to solve problems; making decisions on behalf of others; contributing to ideas to innovate and change; and being creative about how your job can function better.

This book covers all of these skills. It will show you that, whatever you think about your mental abilities or the level of your IQ or your formal education, your brain is the most powerful organ you possess. It is the tool that, if used skillfully, can help you perform better in your job, better in your team and better in your organization. By developing your thinking skills to meet the needs of the modern world, you are guaranteed to succeed.

Profile of Author Eric Garner

Eric Garner is an experienced management trainer with a knack for bringing the best out of individuals and teams. Eric founded ManageTrainLearn in 1995 as a corporate training company in the UK specialising in the 20 skills that people need for professional and personal success today. Since 2002, as part of KSA Training Ltd, ManageTrainLearn has been a major player in the e-learning market. Eric has a simple mission: to turn ManageTrainLearn into the best company in the world for producing and delivering quality online management products.

Profile of ManageTrainLearn

ManageTrainLearn is one of the top companies on the Internet for management training products, materials, and resources. Products range from training course plans to online courses, manuals to teambuilder exercises, mobile management apps to one-page skill summaries and a whole lot more. Whether you're a manager, trainer, or learner, you'll find just what you need at ManageTrainLearn to skyrocket your professional and personal success.

http://www.managetrainlearn.com

1 What Are Thinking Skills?

Few of us spend much time consciously practising thinking skills. We believe that thinking is either a natural function or believe that the great thinkers among us are gifted. Nothing could be further from the truth. All research shows that each of us has a hugely powerful potential in our brains that lies vastly under-used. Moreover, when faced with a wide range of unsolveable problems in our lives, the need to use this potential has never been greater.

1.1 The Potential of the Brain

The facts about the brain are truly stupendous. For example, did you know that the human brain takes up a fifth of all the energy generated by your body in its resting state? It is similar to a 20-watt light bulb continuously glowing. How big do you think the brain is? Well, if you can imagine it, your brain consists of 100 billion cells, each one of which connects to 1000 other brain cells making a total of 100,000 billion connections. There are more cell connection points in the human brain than there are stars in our galaxy. As Norman Cousins put it, "Not even the universe with all its countless billions of galaxies represents greater wonder or complexity than the human brain."

1.2 Brain Power

Here are some more astonishing facts about your brain. Although the brain weighs just 3lb, it contains 12 trillion nerve cells (more than two and a half times the people on this planet). It contains 1000 trillion trillion molecules (way beyond our ability to compute), and can process 30 billion bits of information a second. Your brain has 10 billion neurons and the range of connections all the neurons in the brain could make would amount to one with 28 noughts after it. Just stop and write that down to get a feel for what that is. Your brain has enough atomic energy to build any of the world's major cities many times over. Unsurprisingly, no human being has yet existed who has been able to use all the potential of the brain. How about you?

1.3 Exploding the Myths

One of the reasons we fail to make the most of our brain and, therefore, our thinking skills, is that we hang on to a range of inherited assumptions about our brain and our capacity to think. Many of us believe that, contrary to the facts, we are either born bright or stupid. We think that we are only as intelligent as our measured Intelligence Quotient (IQ) and that this is fixed throughout our lives. We think that, when we run up against big problems, they just can't be solved. We fret over taking decisions and bemoan our ability to choose wisely. We think that we are stuck with the way we think and that we cannot change it. And to top things off, we think that, as we age, our brain declines and with it, our abilities to remember things. The only one of these assumptions that is true is that it is only our thinking that limits the power of our brains.

1.4 Brainworks

A simple look at what we ask of our brains is enough to show us what a wonderful organ this is. First, unlike other species (at least to our knowledge), we are the only species that can think in the 3 dimensions of past, present, and future. We can use our brains to interpret our world in any way we choose, at one extreme, positively and, at the other, negatively. We can use our brains for working out answers to logical problems as well as using it imaginatively to work out answers to

illogical problems. We can imagine with our brains, invent and innovate. We can learn, change and develop. We can use our brains to interpret, understand, and become wise. We can use our brains to analyse things and to synthesise things. And, again, uniquely for species on this planet, we can use our brains to think about our thinking. The brain is truly the most complex and versatile tool we have in our bodies.

1.5 Brain not Brawn

Given the wonderful instrument that our brains are, it is astonishing that, until very recently, thinking was regarded in industrialised countries as a second-class skill. For several centuries, people were employed first for their manual labour, secondly, for their machine-operating skill and lastly, and only if called upon, for their thinking ability. Today, all that has changed. We no longer live in an industrialised age but an information age. Instead of brawn, the successful companies and economies of today and the future need brains. They are the ones that will harness, use and reward the combined thinking abilities of everyone in them.

1.6 Management Thinking

So what kind of thinking skills do we need in the Information Age? Mike Pedler and Tom Boydell are researchers who have studied the qualities needed by successful workers. They found that at least half of the key skills are those that relate to how we use our brains. Their list reads:

1. command of basic facts
2. relevant professional understanding
3. continuing sensitivity to events
4. analytical, problem-solving, decision-taking and judgment-making skills
5. social skills and abilities
6. emotional resilience
7. proactivity: an ability to respond purposefully to events
8. creativity
9. mental agility
10. balanced learning habits
11. self-knowledge

1.7 Thinking Matters

All of us are capable of developing our thinking in all these different skills. But we are slow to change. Percy Barnevik, former chairman of ABB says, "Organisations ensure people only use 5 to 10% of their abilities at work. Outside of work, the same people engage the other 90 to 95%." By contrast, Jack Welch, former CEO of General Electric, says that encouraging ideas was one of his top three tasks, (the other two were, selecting the right people and allocating capital resources). One of Welch's typical approaches was to ask his managers not only what their ideas were, but who they shared them with, and who adopted them.

When the factory of American entrepreneur and founder of IBM, Thomas Watson, burnt down, Watson was surprisingly unfazed. When asked why, he said that the wealth of his business was not based in his offices, assembly lines, and buildings but in the intellectual capital of his employees. He said, "I can re-build the offices and buildings. But I could never replace the combined knowledge, abilities and thinking skills of my people."

1.8 Key Points

1. The human brain is so powerful that few of us come anywhere near to using it as well as we could.
2. Every person has the ability to think intelligently and creatively.
3. The brain is the source of key mental faculties such as memory, imagination, creativity and innovation.
4. The brain is the key tool for mastering the modern information age.
5. Everyone in a modern organisation is a knowledge worker to some extent.
6. According to research, half the skills needed by successful workers involve the use of thinking skills.

2 Positive Thinking

For much of the time our thoughts let us down. They are confused, disjointed and reactive. They don't have to be. Through training our thoughts to be positive, focused and assertive, we can at a stroke improve the quality of our thinking.

2.1 Untrained Thinking

When we treat the brain as an unknown quantity that we cannot manage, then our untrained thinking is likely to consist of all or some of the following:

1. doubts, fears and catastrophising: the phenomenon of letting one bad thought colour the rest of our thinking
2. fantasising: imagining the worst is likely to happen and directing all our thoughts to planning for it
3. self-deprecating: letting mistakes and failures lead us to believe we're not good enough
4. remembering the worst: worrying about something we did in the past that we can't change
5. confusion: having no clear goals or plans
6. reactive thinking: thinking in habitual or limiting ways
7. distraction: the inability to concentrate and direct our thoughts at will.

2.2 Distorted Thinking

There are many common types of distorted thinking. Here are four. First, there is lazy thinking where we think in habitual ways rather than in questioning our thoughts. Second, there is compulsive and obsessive thinking where the same thoughts reverberate in our heads again and again. Third, we continually think in musts, should, and oughts when we use our brains to judge what we do and how we think. Fourth, there is black-and-white thinking, where we swing from believing that things are wholly good one minute and wholly bad the next. All of these are negative and limiting types of thinking.

2.3 Catastrophising

In an untrained person, doubts and fears can form a large part of what passes for thinking. Doubts and fears start small but can feed on themselves until they take over. It's what happens when having left home, the thought occurs that we left the gas or electric on: very soon all our thinking is swamped by this one fear of catastrophe. Here is an anecdote that shows what can happen in the untrained thinking mind.

A woman is driving along the motorway at night. Her thoughts start to race:

"What if I get a puncture on the motorway? I'll have to stop and walk through the dark to the nearest garage. Then I'll have to ask someone to come out and fix the tyre. They're bound to charge the earth at this time of night. They're bound to look down their nose at me as well. What a nerve!"

Just then she arrives at the garage, still thinking these thoughts, fills up her tank, and as she goes to pay her bill, blurts out to the astonished cashier: "...and you can keep your bloody jack as well."

2.4 Confusion

A good exercise to find out what you habitually think about is to take time out to sit and relax and jot down the kind of thoughts you automatically get. A series of such "soil sampling" usually produces a mixture of thoughts: we have thoughts about things on our mind, thoughts about pressing needs such as "I'm hungry" and thoughts coming in because of external interference. For many people the content of what normally goes on in their heads is jumbled and confused.

"Life does not consist mainly - or even largely - of facts and happenings. It consists mainly of the storm of thoughts that is forever blowing through one's head." (Mark Twain)

2.5 Distraction

The human brain connects to 24,000 ear fibres, 500,000 touch detectors, 200,000 temperature sensors and 4 million pain sensors. It is no wonder that with this capacity to absorb information, we find it hard to concentrate on just one thing at a time. So, instead of focusing, we let our minds wander. Instead of thinking what we need t say, we say the first thing that comes into our heads. Instead of getting to the point, we let our minds go walk about.

2.6 Yo-Yo Thinking

As well as being distracted, many of us have a tendency to swing from a positive mood to a negative one in what we might call "yo-yo thinking": one minute up, the next minute down.

The story is told of the farmer whose ox died and, in panic, went to the wise man of the village and wailed: "I will be ruined. Isn't this the worst thing that has ever happened to me?" The wise man replied: "Maybe so, maybe not". A few days later, the farmer caught a stray horse on his land and used it to plough the fields in half the time he would have taken with the ox. He returned to the wise man and said: "Isn't this the best thing that has ever happened to me?" Again, the wise man replied: "Maybe so, maybe not". Three days later, while still overjoyed with his good fortune, the horse threw the farmer's son into a ditch and broke his leg.

Moral: Things are rarely as good - or as bad - as we think.

2.7 The Self-Image

The self-image is the key player in our thoughts. To understand its importance we need to turn Rene Descartes' maxim, "I think, therefore I am", back-to-front into: I AM WHAT I THINK.

Whatever we think we are, we are. Our self-talk creates our self-image. This is because our thoughts are always directed to proving what we want to believe. So, if we think we are stupid at maths, our thoughts will automatically seek evidence that proves it and ignore evidence to the contrary. Similarly, if we think we are quite clever at maths, we will seek evidence to prove it. So, the key to releasing the potential of our thinking is to build a confident self-image in which our thinking is a partner in describing who we see ourselves to be.

"Life consists of what a man is thinking about all day." (Ralph Waldo Emerson)

2.8 Positive Re-Framing

The reason why a positive self-image and positive thinking succeeds isn't only mental. It is also physical. Studies have demonstrated that the neurons in the hippocampus (a part of the brain responsible for day-to-day memory and new learning) can shrink when we are stressed. Dendrites, the connecting wires between brain cells, have been known to permanently shrivel in response to negative thinking. On the other hand, love, affection and happy moods can strengthen these dendrites and enhance our ability to solve intellectual and practical problems. The negative thinker's answer to: "Can you play the piano as well as Barenboim?" is probably, "No, I never could." The positive thinker's answer is "Not yet."

2.9 Expecting the Best

Most of us find it easy to worry, but we invariably worry about the worst that might happen to us. By changing our thought direction, we can replace worrying about the worst into worrying about the best.

Worrying positively has the same characteristics as negative worrying: nagging thought patterns; visualising ourselves in the situation; playing and replaying every possible angle; hearing what we will say, feeling what we will feel, saying to ourselves what we will say.

Olympic javelin thrower Steve Backleypractised positive worry when he sprained his ankle four weeks before a major competition. Instead of giving up, he mentally practised his throws from his armchair until he had made over a thousand throws. When the competition came, Backley made the throws he had mentally made and won.

2.10 Your Brain Wants Success

For much of the 20th century, it was thought that the brain was a trial and error mechanism: we tried something and if it worked, fine. If it didn't work, too bad. End of story. We now know differently. The brain is not a trial and error mechanism but a trial and success mechanism. When set a clear goal, it actually seeks out not error but success. Error is not incorrect or faulty programming but simply deviation from the correct course. We set our goals. We try, succeed, succeed, succeed, succeed, succeed, make an error, check, adjust, succeed, succeed. Your brain actually wants you to succeed and it lets you know that you can succeed through training your brain to think in constructive, creative, and positive ways.

2.11 Key Points

1. Untrained thinking is often confusing, distracted and negative.
2. Trained thinking is usually focused, confident and positive.
3. The human brain believes what we let it believe rather than what it knows to be true.
4. Worrying negatively is the same process as worrying positively so just change your focus.
5. "Yo-yo thinking" is alternately thinking things are very good or things are very bad.
6. The key to making the best use of our thoughts is to build a positive and confident self-image.

3 Improve Your Memory

Most of us complain at some time about our poor memories - especially when we forget things that are important, such as birthdays, anniversaries and meetings. But it is not memory that lets us down. Our brains remember everything we have ever experienced; we know this from near-death experiences, hypnosis and feelings of déjà vu. What is at fault is our ability to recall.

Here are 7 ways we can help our ability to recall facts and experiences of the past.

3.1 Synaesthesia

Synaesthesia is the association of memory with our senses. Dr Frank Staub of Yale University demonstrated that you can easily improve your memory when you link the things you want to remember with a memorable sight, sound, feeling, taste or smell. In one experiment, he wafted the aroma of sweet chocolate over a group of students who were preparing for an exam. On the day of the exam, he released the same aroma while the students were taking the exam. The result was that these students out-performed everyone else.

3.2 Landmarks

The reason why synaesthesia works is because what we want to recall is associated with a striking landmark. Landmarks don't have to be limited to the five senses. They can be anything emotional, shocking, funny, unexpected, silly, embarrassing, or outrageous. That's why people can recall precisely what they were doing at the time of shocking news events, such as the assassination of John Kennedy or the death of Diana, Princess of Wales. It's also why we never forget our first day at school, a beautiful romantic holiday, and our first teenage kiss.

3.3 The Peg System

The peg system is a great way to remember a sequence of numbers, for example the phone number 302187. All you do is give each number a rhyming "peg" word and then make up a crazy, silly or exaggerated story about it with the words in the right order. So, let's say 3 = knee, 0 (nought) = wart, 2 = glue, 1 = sun, 8 = gate, and 7 = heaven. We could then make up the following story: "First I wrote the phone number on my knee around a wart. I put some glue on it to keep it in place. Suddenly the sun came out, so I went out the gate and found myself in heaven." Try it. You'll find the story is always easier to remember than the numbers.

3.4 Rhymes

The Peg System works because we associate a number with a rhyming word, eg 8 and "gate", 2 and "glue". The same principle holds true for much more complex pieces of information. So rhymes help us remember that "In fourteen hundred and eighty two, Columbus sailed the ocean blue" (and discovered America); that "i before e, except after c" (for spelling words like "believe" and "receipt"); and that "30 days hath September, April, June and November…" (for remembering the days of the months).

3.5 Mnemonics

Rhyming words like these are known as mnemonics, after the Greek goddess of memory, Mnemosyne. Another type of mnemonic is associating letters with names in a certain sequence. So, "My Very Educated Mother Just Served Us Nine Pizzas" will instantly help you remember the sequence of the nine planets of the solar system, simply be looking at the first letters of each word. Making the sequence: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. The great thing with mnenonics is that you can make up your own sentences for things you want to remember and you can personalize them to your own situations or make them as silly as you want (remember, silly is memorable).

3.6 Remembering People's Names

The idea of associating something we want to remember with personal, silly, or funny associations is the key to remembering people's names. Let's say you're introduced to a MrLazenby. All you need to do is picture him lazing on a summer's day on a B road and you'll remember his name. Similarly, a MrsPakenham could be imagined packing 'em in in a fish factory and a Mr Forsyth could be pictured as a gardener with four scythes. The reason why these associations work is that you're using both sides of your brain. Your left brain holds the name. Your right brain remembers the silly image. Together they help you recall.

3.7 Repetition

One of the important keys to all these memory tricks is repetition. When we first collect a new piece of information, it goes straight into our short-term memories. This can only take 8 seconds. The trouble is, the short-term memory is a holding area for new information and unless we move stuff out, it will quickly be replaced with newer information. Moving information out means moving it into our long-term memories where it can remain indefinitely. The problem here is, it can take anything up to 6 hours to get something firmly embedded. And that's where repetition, review, and replay come to the rescue.

Some scientists regard memory as the Rosetta Stone of the brain: the key that unlocks all the secrets of the mind. In an age of information, where most people are knowledge workers of one sort or another, having a good memory and being able to make the most of what you know isn't just nice to have; it is essential.

3.8 Key Points

1. When we forget something it is not because of a poor memory but because of our inability to recall.
2. There are various ways to increase our power of recall, all making use of our imaginative right brains.
3. Events that are shocking, emotional and silly stay in the memory longer than things that are mundane and normal.
4. You can remember an event more vividly when you associate it with one or more of your five senses, such as smell or taste
5. Mnemonics are one of the best ways to remember lengthy or complex information by associating numbers with rhyming sounds.
6. To move information from your short-term memory into your long-term memory, you need to repeat it enough times to make it stick.

4 Blocks to Thinking

Thinking, like communicating, is one of those functions we think we should be good at because we do it all the time, do it without effort and have done it for all of our waking lives. But there is a difference between just doing something like thinking or communicating and doing it well. Just as with communicating effectively, what stops us from thinking effectively for much of the time are the perceptual, emotional, cultural and environmental blocks that get in the way. Here are 7 of those blocks.

4.1 Assumptions

When we assume, we often make an "ass" out of "u" and "me". Assumptions are examples of lazy thinking. We simply don't wait to get all the information we need to come to the right conclusions. There is the story of the customer at the bank who after cashing a cheque and turning to leave, returns and says: "Excuse me, I think you made a mistake." The cashier responds, "I'm sorry but there's nothing I can do. You should have counted it. Once you walk away we are no longer responsible." Whereupon the customer replies: "Well, okay. Thanks for the extra $20."

Tip: When you feel yourself wanting to draw conclusions, just wait until you have all the information.

4.2 See Things from Other Points Of View

A truly open mind is willing to accept that, not only do other people have other just as valid points of view from theirs, but that these other points of view may be more valid. A story is told that the modernist painter Pablo Picasso was once travelling on a train across Spain when he got into conversation with a rich businessman who was dismissive of modern art. As evidence that modern art didn't properly represent reality, he took out a photo of his wife from his wallet and said: "This is how my wife should look, not in some silly stylized representation." Picasso took the photo, studied it for a few moments and asked: "This is your wife?" The businessman proudly nodded. "She's very small," observed Picasso wryly.

Tip: Don't have a monopoly on how things are. Things aren't always what they seem. Be ready to consider other points of view.

4.3 Thinking and Doing

It is part of Western intellectual tradition that the thinking part of a decision is separate from the implementation part of the decision, as if the decision was one thing and the implementation something quite different. Hence the gulf between those who take decisions, often in positions of authority, and those who carry them out: thinkers and doers.

In Oriental philosophy, which has a much longer tradition than Western philosophy, the gap is not understood. Here there is no gulf between thinking and doing. There is only process. A decision and its implementation are part and parcel of the same thing. This means that the decision can be changed as the implementation proceeds, just as the method of implementation can be changed if the decision is reviewed in the light of new information.

Tip: Involve implementers in the decision process.

4.4 Get Rid Of Lazy Thinking Habits

Habit can be a major stumbling block to clear thinking and another example of laziness. Try this experiment. Write down the Scottish surnames Macdonald, Macpherson, and Macdougall and ask someone to pronounce them. Now follow these with the word Machinery and see what happens. Most people are likely to mis-pronounce it. This is because we tend to think in habitual ways and don't like what doesn't fit.

Tip: Don't think that, just because things happened in a certain way once before, they will happen like that every time.

4.5 Think like A Child

Research shows that the number of synapses, or connections, in the brain is greater in a child of two than in an average adult. The reason for this is that a child of two has no limiting world view, as adults do. It's like a sculptor who starts off with a large block of clay that can become anything. As he gradually removes the clay, the possibilities in his sculpture become less and less until it represents just what he's looking for. If we use our brain like a child, accepting everything without judgment, we can actually halt and reverse the brain ageing process and become fully open-minded again.

Tip: With the right stimulus and a passion for wonder, you can think like a child again.

4.6 See the Detail As Well As the Big Picture

There is a poem by John Godfrey Saxe called "The Blind Men and the Elephant". It tells how six blind men of Indostan go to see an elephant and each try to work out what it is from touching it. One blind man touches the tusk, another the trunk, another the tail, and so on. Of course, not being able to see the whole elephant, they disagree about what the animal is. When we see the detail and the full picture, it is easier to give everything its right context.

Tip: Try to keep the big picture in front of you while looking at the details. It will help to put everything in its proper place.

See the full poem here: http://www.noogenesis.com/pineapple/blind_men_elephant.html

4.7 Think For Yourself

Taking time out to think is still frowned on in many organizations that prize activity over creativity. People who work in creativity-constrained organizations are likely to think the way they are supposed to think, or as others think, or as has always been the way to think. It's like the blinkered thinking that Hans Christian Anderson describes in his story of "The Emperor's New Clothes". Everyone in the land refuses to see that the emperor is naked and has been duped into believing he is wearing a splendid costume for his coronation. Only a young boy who has been ill and not party to the cultural brainwashing can see the truth and cries out: "Look, everyone, the Emperor is wearing no clothes!"

Tip: Don't let others tell you how to think. When others ask your opinion, tell it to them straight.

4.8 Time to Think

One of the biggest stumbling-blocks to thinking is that, in many organisations, we still don't recognize that it is sometimes more important than activity. Here is a story that illustrates an anti-thinking attitude.

The car-maker Henry Ford hired an efficiency expert to go through his plant. He said: "Find the unproductive people. Tell me who they are and I'll fire them!" The expert made his rounds with his clipboard in hand and finally returned to Henry Ford's office with his report. "I've found a problem with one of your managers," he said. "Every time I walked past his office, he was sitting with his feet propped on the desk doing nothing. I definitely think you should consider getting rid of him." When Ford asked who the man was, he shook his head and said: "I can't fire him. I pay that man to do nothing but think. And that's what he's doing."

Each of us has the power to think clearly. It's part of our natural make-up as human beings. The trouble is that, too often, we block our natural thinking ability and so make errors in judgment. By unblocking your thinking, by not judging, not making assumptions, and not blindly accepting the views of others, you can access the full creativity of your thinking.

4.9 Key Points

1. We often make wrong assumptions about what we see because of prejudice and false expectations.
2. We each see the world differently because of our thoughts; every "thing" is a think".
3. Thinking like a child is more open and creative because it is not layered with years of learning and habit.
4. Culturally-accepted ways of thinking can sometimes limit us to thinking in familiar ways.
5. Well-directed and well-trained thinking is always more productive than activity.
6. Successful enterprises need original thinking if they are to avoid blindly following the thinking of the majority.

5 Logical Thinking

Logical thinking is to think on the basis of knowledge, what we know, and certainties, what we can prove. The past two centuries have witnessed an unparalleled reliance on the logical approach to thinking. It is the basis on which modern technology is founded. But the flaw in logical thinking is that it relies on the conscious brain and this is the most limited and vulnerable part of our thinking.

5.1 Left-Brain Thinking

Logical thinking is the part of the brain that relates to its left-hand side ("l" for "left" and "l" for "logical"). It was Professor Roger Sperry of the University of California who discovered that different sides of the brain were responsible for different functions. He discovered that the left-brain...

- governs the right side of the body
- governs the right field of vision
- deals with input sequentially
- perceives the parts more than the whole
- perceives time
- is the seat of verbal skills

- is the seat of logical and analytical thinking
- sets goals, plans and reviews: the managerial mind
- formulates evocative language

The left side of the brain is the chattering mind, thriving on, but limited by, information.

5.2 Right Brain Thinking

Just as he explained the workings of the logical, left-sided brain, so Roger Sperry also discovered that the right-hand side is responsible for romantic types of thinking ("r" for "romantic" and "right-sided"). In contrast to the left, he discovered that the right brain...

- governs the left side of the body
- governs the left field of vision
- deals with inputs simultaneously
- perceives the whole more than the parts
- perceives space
- is the seat of visual skills
- is the seat of intuitive and kinaesthetic perception
- is responsible for imagination and visualisation
- formulates symbol and metaphor.

5.3 Managerial Thinking

Managerial thinking tends to use the functions of the left brain more than those of the right brain. The sort of workplace issues that use left-brain thinking are analysing and detecting faults in mechanical processes through collecting, checking and testing information; investigating problems of the "what went wrong?" variety; learning from how things have been done in the past to improve the way we do them next time; and obtaining information that answers "what?", "where?", "who?" and "why?" questions. All of these issues rely on information and on information being correct, complete and understood.

5.4 Logical Thinking

Logical (or left-brain) thinking comes into its own when we are working with verifiable and reasonably certain information. This is information we can be sure about because it has been confirmed scientifically. Using "scientific" information allows us to develop our knowledge by making logical deductions. It is the kind of thinking used in playing games of chess, (where there are quite definite rules) and solving puzzles for which there is an answer.

Logical thinking uses 5 steps:

1. a clear goal or solution
2. systematic planning
3. using information
4. reasoning
5. checking conclusions

5.5 SMART Goals

The first step in logical thinking is a clear goal. Working towards clear goals is often described by the mnemonic SMART. These are goals which are Specific, Measurable, Achievable, Realistic and Time-bounded. For example, it may be a department's goal to produce 30 tons of product a day from 28 tons after upgrading its machinery. SMART goals are managerial goals. They lend themselves to plans and the application of a step-by-step thought-and-action process. Clear goals work from a known starting point (that is, now) in a series of steps and sequences until the goal is reached. SMART goals assume that the future will be the same as now, that resources will stay the same and that nothing will interrupt the execution of the plan. If anything changes, then so will the SMART goals.

5.6 Systematic Planning

Systematic planning is the second step in the SMART process towards a goal. We know the "what?" because we have defined a clear goal; systematic planning tells us the "how?" to get us there. Systematic planning aims to find the correct method, the correct procedure, the correct system that can logically take us to our goal. In SMART goal thinking, planning is "systematic" because we can try it out in different circumstances, repeatedly and with different kinds of information. It is like a computer programme into which we type our formula and apply our information to come up with THE answer.

5.7 Using Information

The remaining steps in the SMART process involve using our left-sided brains to work towards our goals. Information is key to this process. We need to group it, organize it, rank it, fit it into the bigger picture, and make connections with it. It needs to be as accurate and verifiable as possible or else there can be no basis for further logical thought. Where information is uncertain, difficult to check, subject to change, not easy to understand, then it is of limited use.

5.8 The Limits of Information

Logical thinking relies wholly on how reliable your information is. But, in a fast-changing world, information presents us with a number of problems.

5.8.1 there is too much of it

We are bombarded today with huge amounts of information, much of it contradictory. It is calculated that one copy of the British Sunday Times contains in it more information than a medieval man would have had access to in a lifetime.

5.8.2 it gets distorted easily

All knowledge comes to us via someone else's perception and is filtered by our own perception. Even the most unbiased of television news-readers cannot avoid an occasional voice inflexion or raised eyebrow when they deliver a story. We can never be absolutely sure of the motives and thinking behind the information we receive. "Never ask a hairdresser if you need a haircut."

5.8.3 it is incomplete

We can never know whether the information we receive is complete or incomplete. In the hours after the death of Diana, Princess of Wales, in a car accident in 1997 everyone believed that she had been a victim of pursuing photographers. Later it was discovered that her chauffeur had excessive levels of alcohol in his blood.

5.8.4 it is quickly outdated

In today's world of instant access to information via world-wide communications, knowledge quickly becomes outdated, obsolete and forgotten. All through history, when a craftsman learned his trade after a period of four, five or six years of apprenticeship, he had learned everything he would ever need to know. It would be sufficient for the rest of his working life. Today, this is no longer enough. We need updates every few years to keep abreast of what is happening in our chosen field. The giant American corporation, General Electric, has speculated that a newly-recruited engineer's knowledge will be out of date within five years of starting in the job.

5.8.5 our conscious brains can only hold a limited amount of information

Our knowledge-holding brains - the conscious thinking parts - are only capable of holding a limited amount of data at any one time. Most of us find it hard to keep more than about 7 or 8 facts in our conscious brain at any one time. To test this, deal someone 7 or 8 cards from a pack of playing cards; allow them 15 seconds to memorise them in their heads; and then ask them to turn the cards over and recall them. Very few people can successfully remember every single card. Now contrast this with the sub-conscious brain which stores every single experience and thought that we have ever had and still has room for a huge amount more.

The logical, or scientific, approach to thinking relies on information about the world around us. From it, we can create the most wonderful inventions and manifestations. But, in a fast-paced world, this information is quickly out-of-date, quickly inaccurate, and quickly useless. If we are to rely on logical thinking to succeed in life, then we need to be masters of left-brain thinking.

5.9 Key Points

1. Ordered thinking is thinking that is analytical, sensible and systematic.
2. The left side of the brain is the seat of logical thinking.
3. The right side of the brain is the seat of imaginative thinking.
4. Logical thinking allows us to make incremental progress based on verifiable information.
5. While logical thinking relies on facts and information, information itself can be unreliable and inaccurate.
6. The analytical conscious brain is limited in the amount of information it can hold; while the creative subconscious is unlimited.

6 Creative Thinking

In our Western systems of thinking, there is a strong bias towards using the left-brain. We tend to prefer ideas that fit pre-conceived patterns, systems that have been proved and solutions that are low-risk. But in a time of change, where we need to solve major intractable problems, we need to be more creative and instead of known thinking and known solutions, develop new thinking and new solutions, ie using the right-brain. Here are 7 ways to be more creative.

6.1 Think like A Child

As adults we tend to think in a conditioned way aimed at showing how clever we are. Yet, as children, we are simply spontaneous and far more curious in our thinking. To re-capture your childhood curiosity, allow yourself to just wonder at things, to be completely present in the here and now, and to detach yourself from what you thought was real.

Why are leaves green?
Who is Father Christmas?
What makes us yawn?
Where do people come from?
Why do we have to go to sleep?
What's at the end of a rainbow?
What happens when we die?
What makes us laugh?

Why do people fight?
What makes the light go on?
Where do animals go when they die?
Why do we have to work?

6.2 Be More Curious

The search for new answers to old problems starts with being curious about the problem and looking at it with fresh eyes. Sigmund Freud said that such curiosity came more naturally to children than adults.

Other great inventors have also recognised the importance to creative thinking of being curious about the world. This is how Leonardo da Vinci described his endless curiosity: "I roamed the countryside searching for answers to things I did not understand. Why shells existed on the tops of mountains along with the imprint of coral and plant and seaweed found in the sea. Why the thunder lasts a longer time than that which causes it and why immediately on its creation the lightning becomes visible to the eye while circles of water form around the spot which has been struck by a storm and why a bird sustains itself in the air. These questions and other strange phenomena engaged my thought throughout my life."

6.3 Play with Ideas

The route to creativity is to see things in ways that nobody has seen before. Albert Einstein, the father of modern science, imagined how his theory of relativity could work by lying on a grassy hillside and picturing himself riding on a sunbeam into the universe. Steven Spielberg, director of the science fiction film "Close Encounters of a Third Kind", imagined the spaceship he used in the film by standing upside down on his car bonnet and looking at the night lights of Los Angeles.

The great comedian, Buster Keaton, was one of the most original and inspired creative thinkers of the era of silent movies. He was once asked onto the set of a film to help a director who had put a character into a predicament from which there appeared no logical escape. The character had to get out of a room through one of two doors. One door led into an adjoining room where there was a group of people whom he did not want to meet. The other door led to the outside where the plot had inconsiderately placed a vicious barking dog.

Without even stopping to think, Keaton provided a solution. All the character had to do was to take the door off its hinges, open it a bit to let the dog into the room and then escape the snatches of the dog's teeth by swivelling the door around full circle, leaving the dog on the inside and himself on the outside.

6.4 Make New Connections

To be innovative doesn't require a university degree; it simply requires making a connection between existing ideas. For instance, did you know that ice cream was invented in 2000 BC yet it took another 3900 years for someone to come up with the idea of a cone? It's when you take two seemingly unrelated items and use the spark of creativity that inventiveness happens. This is what one inventor did when he was puzzling one lazy morning in bed about how to invent the perfect egg-cup that would adjust to fit all shapes and sizes of egg. Suddenly a bed-spring collapsed with a twanging sound, and the perfect egg-cup, a coiled metal spring to support any kind of egg, was invented.

Try this trick for yourself. Put together two unconnected objects in the room right now - such as a stapler and a pair of scissors - and find a use for them.

6.5 Be A Little Illogical

One of the least logical thinking systems in philosophy is the Oriental school of Zen Buddhism. Zen attempts to go beyond the confines of logic to enlightenment.

Zen means "meditation". It takes problems and presents them in ways that make you think. One "koan", or problem, with no intellectual solution, asks: "what is the sound of one hand clapping?" and another: "when a finger points at the moon, the imbecile looks at the finger."

A Zen tale tells of a Zen master who came across a disciple walking on water. "What are you doing?" he cried. "Crossing the river," replied the disciple. "Come with me," ordered the master and together they walked a great distance until they found a ferryman. As they climbed onto the boat, the master said pointedly: "This is the way to cross a river."

6.6 Laugh More

Tom Peters says that the creativity of a workplace can be measured by a laughometer, ie how much people in the organisation laugh. Humour is one of the greatest creative devices. It jolts us out of our normal patterns and puts ideas together that shouldn't go together. It has been found that after listening to comedy tapes, students' ability to solve problems rises by 60%. "I like nonsense, it wakes up the brain cells. Fantasy is a necessary ingredient in living, it's a way of looking at life through the wrong end of a telescope and that enables you to laugh at life's realities." (Geisel Theodor Seuss)

6.7 Think Outside Your Limits

Many of the products we take for granted today are the result of people thinking outside their limits. John Lynn recalls attending a computer conference in the 1980's at a hotel when someone joked that the next thing they'd be thinking of would be computerised doors. When he went back to the same hotel 20 years later, all the doors used computer-programmed key cards. You can practise this kind of thinking with these pointers:

- let go of old ways of seeing, thinking and doing
- question what you see, remembering that we distort what we see with our perceptions
- have a clear understanding of what outcome you desire but divorce the outcome from the method
- be aware that thinking in familiar patterns can limit your options of what is possible
- free yourself from judging your own ideas
- find a stream of creative ideas by thinking more like a child
- take risks and dare to do things differently
- be absolutely sure that you will succeed.

When we think vertically, we limit ourselves to what we already know, what's been done before and the old ways of thinking. We can build upwards as a result but our progress is more of the same, or vertical evolution. The alternative to vertical thinking is lateral, or horizontal, thinking. It is also outrageous thinking, curious thinking, thinking the unthinkable, and creative thinking.

6.8 Key Points

1. Creative thinking at all levels has become a necessity for organisations to stay ahead in the modern business world.
2. When you're in the wrong hole, it's no good digging deeper; you need to get another hole.
3. Children tend to be more curious about their world than adults.
4. One simple way to increase your creativity is to make new connections between unrelated objects and ideas.
5. Creativity requires us to open up our minds to experiences and ideas we don't usually have.
6. A creative workplace is invariably one in which there is a large amount of humour and irreverence.

7 Brainstorming

Brainstorming is the most widely known and used method of group thinking. Thinking with others has a number of advantages over thinking alone. It increases the number of ideas we can have; it increases the quality of ideas; it allows us to scrutinise ideas more carefully; and it ensures that ideas that get supported have a better chance of successful implementation.

7.1 Brainstorming

The name "brainstorming" was originally used in the 1950's by Alex Osborn, the founder of an advertising firm. The aim of brainstorming is to produce the largest quantity of ideas concerning a problem in the shortest possible time. Osborn proposed 5 rules in brainstorming:

1. no evaluation of ideas
2. wild ideas to be encouraged
3. quantity of ideas is important
4. participants should build on each others' ideas
5. apart from the above four, there are no other rules.

7.2 A Brainstorming Session

A brainstorming session can be applied to both problems which have a single solution waiting to be discovered, eg a machine fault, as well as situations where there is no known solution, eg how to improve your customer relations. The following are the steps in a brainstorming session:

a) select a scribe to write down the ideas (speedily)
b) create a relaxed climate
c) start with a brainteaser to warm people up
d) use flipcharts to record ideas that everyone can see
e) ensure nobody dominates
f) encourage a free flow of ideas
g) use a facilitator to guide and support
h) have a set time limit, say, of 10-15 minutes
i) only evaluate ideas once you have finished.

7.2.1 Sparking

The first stage in brainstorming is to spark as many different ideas as you can about the problem. For example, in response to the problem, "How can we improve the paperwork systems in the office?", these ideas might be suggested:

- buy a concertina file
- colour-code the paper files
- microfilm them
- burn them
- place them on computer
- code them according to the Cyrillic alphabet
- hang them on a line
- put them in pigeonholes
- spread them over the walls
- send them back to where they came from
- put them in colour-coded wastebins.

7.2.2 Paradoxical Intention

Paradoxical intention is a brainstorming technique for sparking more ideas by deliberately thinking of ways to make the problem worse. In the example of how to improve the paperwork in an office, you could add the following to the list:

- tell everyone to put things in writing
- mix the files up
- leave them in untidy piles
- remove the filing cabinets
- don't have a clerk
- collect others' bills as well.

and so on.

It is possible that one idea might paradoxically have the basis of a solution: in this case, the office could agree to collect others' bills and turn itself into an archive-centre.

7.2.3 Seeding

Seeding is a brainstorming technique that takes a word that has nothing to do with the problem and seeing what connections you can make between it and the problem. For example, if we were looking at ideas to improve the way we organise office systems, we could at random propose the word "breakfast". This could then seed the following ideas:

- keep all the paperwork files in empty cornflakes packets
- sort the papers out over breakfast
- stick the papers together with marmalade
- hold a breakfast meeting to discuss ideas
- devise a filing cabinet in the shape of a breakfast bar
- have a daily breakfast-time clear-out of files
- have a deadline on all incoming paperwork by breakfast time each day.

  and so on.

7.2.4 Wording

Wording is a brainstorming technique that takes each word or group of words that spell out what the problem exactly is and seeing what ideas each word sparks. For example, in the case of ideas to improve the way we organise our office paperwork systems, the following might be suggested:

"How...": are there different methods we could try out? How do others do it? How are we in this mess?
"can...": are we capable? do we need expert help? what skills don't we have that we need?
"we...": is there someone else we can pass the problem to? do we need to change?
"organise...": why do we need to organise the papers?
"the paperwork...": why papers? can't we computerise?
"in the office...": why do they have to stay in the office? why do they have to come to this office?

7.3 An Example of Brainstorming: The Honey Pot

Pacific, Power and Light (PP and L) is the electric utility responsible for providing power to the NorthWest Cascade Mountain area of the United States. This area faces severe weather in spring and autumn each year resulting in heavy ice deposits on power transmission lines. Lines frequently come down under the weight of the ice.

The company's method of removing the iced lines is to send linesmen through the snow and up the icy pylons and to physically shake the ice off the lines. It is a long, arduous, costly and unpleasant way of dealing with the problem.

A brainstorming session is held to look at what can be done.
The PP and L group spend a whole morning looking at the problem but get nowhere. Frustrated and running out of ideas, the group decide to take a coffee break.

During coffee, Bill, a linesman, has everyone in fits of laughter.
"Last week I was chased by a bear. It even climbed a pylon after me."
As the laughter dies down, someone suggests,
"Why don't we get the bears to climb for us?"
"How?"
"We could put honey pots on top of the pylons."
"No, the raccoons would get there first."
"Anyway we'd need helicopters to put the pots in place and they'd frighten the bears," says one of the secretaries. "I remember the vibrations from helicopters in the Vietnam war when I was a nurse."
There was silence as everyone realises they've struck gold.
Today it is standard practice in PP and L to use helicopters to remove ice from frozen cable lines.

7.4 Brainwriting

Brainstorming isn't always the best way to produce lots of ideas nor lots of good ideas. That's because group dynamics often affect how people contribute. A group with low trust is never going to do well using the standard approach to brainstorming. The way round this is to use the related technique of Brainwriting. In Brainwriting, the group don't work as a group, they work individually by writing their ideas down on a sheet of paper and then take turns in passing these round to others to add to the list. This way, people can share ideas anonymously and quickly and still come up with a large quantity of solutions to choose from.

Brainstorming, and brainwriting, arerecognised as two of the best ways to use groups to improve thinking and creativity. That's because everyone has the potential to be creative and imaginative rather than just the so-called "clever". Not only do you get more ideas and more options, you also get involvement and commitment to the final decisions.

7.5 Key Points

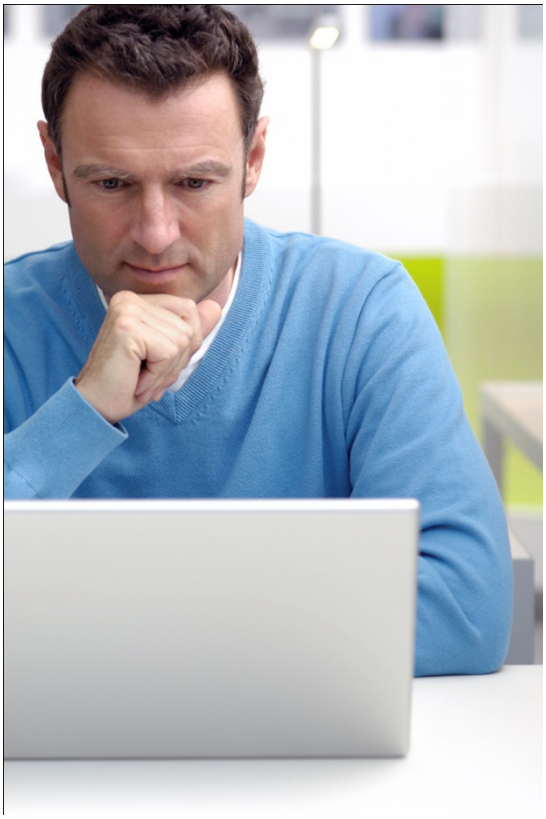
1. You are likely to get more ideas from working with a group than from working on your own.
2. The drawback to working with a group is that others may have different agendas from you.
3. For groupwork to succeed, there must first be agreement on how the group is to work and make decisions.
4. Brainstorming sessions should be held in a relaxed and non-judgmental climate.
5. Be willing to try out crazy ideas in a brainstorming session.
6. Brainwriting is an improvement on brainstorming when a group is not cohesive.

8 Decision-Taking

Managers, team leaders and their staff can take as many as a hundred or more decisions in the course of a day, each day and every day. Many of these decisions are, of course, no more than automatic responses to familiar situations in which they have to choose between two or three options. However, from time to time, we all have to take decisions on which the course of our future and that of others depends. Then, it is a question of making sure they are right. Here are 7 principles to guide you in right decision-making.

8.1 Time Them

There are two traps which people fall into when making decisions: making them too soon and making them too late. Some people make decisions too swiftly and without due thought. This may be because they are uncomfortable with the tension that is created when a decision has to be made but they don't have all the information needed. Instead of living with tension, they make the decision before time. Other people delay making decisions because they fear making a mistake or fear the changes that will result. The best decisions are hot-iron decisions: those that are well-timed, which you make when the iron is hot and the time is right.



8.1.1 Knowing Where to Strike

Decisions should be made with the precision that comes from knowledge and knowing where and when to strike.

A famous shipyard in the 1970's. One day before the maiden voyage of their biggest ship to date.
She wouldn't start. Something wrong with the boiler.
Checked every nut, tightened every bolt. Still nothing.
They sent for an expert. A guy from Hamburg.
Scratched his beard.Said: "My fee's £1000."
The foreman nodded frantically.
"Stand back," said the expert.
He gave the boiler an almighty wallop with his hammer.
It hiccuped, burped, chugged into life. The foreman stood aghast. "£1000 for one thump with a hammer?"
"No," said the expert. "For one thump with the hammer, one pound.For knowing where to thump, nine hundred and ninety nine."

8.2 Align Them

The more decisions you make consciously, the more you can align them with your goals and purposes. Studies show that the average person makes 612 decisions a day. Each one takes us closer or further from our ultimate goals in life. In a week that means 4,900 decisions. In a year, 254,800. Results are cumulative. Strategic thinking means looking at how your decisions today affect your tomorrows. When your decisions are in alignment with what's important to you, then life becomes meaningful, productive and satisfying.

8.3 Balance Them

There are three balancing acts to be aware of in taking a good decision. They are:

- Care and not care. Do all your worrying before the decision and once a decision has been taken, stop worrying.
- Think and act. Too much thinking puts off the action; too much action may be at the expense of thought. Seek the right balance.
- Look before you leap and leap before you look. See the possible risks of your decision but, once decided, take the plunge with courage.

8.4 Act When You Have To

You should only make decisions when you have to. Here are 5 "don'ts" to guide you.

- DON'T make a decision unless you have two or more equally valid options.
- DON'T make a decision if it's somebody else's responsibility.
- DON'T make a decision unless there is disagreement.
- DON'T make a decision about irrelevant matters.
- DON'T make a decision if it can't be turned into action.

"If there's one thing I've learned in politics, it is: never make a decision until you have to." (Margaret Thatcher)

8.5 Use a Decision-Making Model

There are no guaranteed ways to make a perfect decision. As Ian Wilson said, "No amount of sophistication is going to allay the fact that all your knowledge is about the past and all your decisions are about the future." However, there are decision-making systems that can help us in making important decisions. Here are a selection of the best models.

8.5.1 Decision Trees

Decision trees are diagrams which consider the different options of a decision by weighing up the likely outcomes and considering how desirable and probable they are.

Let's say you wanted to start up in business but couldn't decide whether to start now or in a year's time. On the tree you would first state what the outcomes could be of each course. For "starting up now", the outcomes could be "getting into the market early" which would be highly desirable and highly probable; and "over-stretching" which would be quite probable and not at all desirable. On the other hand, for "leaving it for a year", the outcomes could be "missing the market", which would be very undesirable and quite probable; and "better preparation" which would be fairly desirable but only fairly probable.

Weighing the options up, it is clear what the best course is.

8.5.2 Pros and Cons

One of the simplest ways to make a decision is to take a piece of paper and draw a line down the middle of the page. On the right side, list the pluses; on the left side, list the minuses. Weigh up the respective merits of each side, perhaps by giving each factor a weighting, and then decide. Aligned to this method are cost-benefit analyses, and force-field analyses.

8.5.3 Toss a Coin

When all other factors are equal and we can't make up our minds whether to say "Yes" or "No", "This way or "That way", the simplest solution may be to toss a coin. It is worth noting that when Albert Einstein had to make a choice, he would toss a coin and as soon as it landed, he would ask himself how he felt. If good, he would go with it; if bad, he would go against it.

8.5.4 The Equivalent Urn and the Probability Wheel

The equivalent urn and the probability wheel combine the ratings of the pros and cons method of decision-taking with pure chance. In the equivalent urn, which is any large container that can hold ping-pong balls, place black balls for every disadvantage in an option and white balls for every advantage in an option. You can rate each factor from 1 to 10 on the scale of desirability or probability and mark the rating on the balls. Now shuffle the balls and pick one out of the urn (or the best of three). Use these to decide whether to go for it or not. The probability wheel is similar to the equivalent urn, except that the options are drawn on the spokes of a spinning wheel and weighted according to their rating. The wheel is spun and the spoke that points to the winning arrow is the option to take.

8.5.5 Parent, Adult, Child

The Parent-Adult-Child decision-making model uses the Parent, Adult, Child concepts from Transactional Analysis to illustrate three approaches to making a decision.

Let's say we've seen a book that we want to buy at £29.00.

- the Child in us wants it; we love the thought of owning it, feeling it, enjoying it; the thought of owning it thrills us.
- the Internal Parent in us asks us what we should do, wondering whether the money couldn't be better spent elsewhere and whether it isn't a bit of a waste of money.
- the Adult in us weighs up dispassionately what the pros and cons are in the light of our other needs and goals.

We can now make an informed decision whether to buy it or not.

8.5.6 Six Thinking Hats

Edward de Bono's "Six Thinking Hats" and "Six Thinking Shoes" models are attempts to break out of traditional, logical decision-making. Both models use clothing and their colours to prompt us to think in certain ways when making a decision.

- white hat. White is neutral and objective and like white paper, conveys simple facts
- black hat. Black is judgmental like the black hat a judge put on when passing the death sentence
- red hat. Red is fire, warmth and energy and represents intuitive thought. It is the colour of a witch's hat.
- yellow hat. Yellow is the colour of a straw boater and is summery, positive and optimistic.
- green hat. Green, the colour of a gardener's hat, represents new life and new ideas.
- blue hat. Blue is the colour of cool, detached thinking as if we were looking down from the sky.

8.5.7 Six Thinking Shoes

Here are Edward de Bono's six thinking shoes that develop the six thinking hats further.

- navy shoes. Navy blue is the colour of routines, the things that are necessary for survival
- grey sneakers. Grey is the colour of brainwork, as in "the old grey matter" and represents the things we need to know
- brown brogues. Brown is the colour of earth and represents what is practical and down-to-earth
- orange gumboots. Orange is the colour of warning signs, the thoughts we need to assess risks
- pink slippers. Pink is what is comfortable, caring and understanding
- purple riding boots. Purple is pomp and splendour and represents responsible thinking, what we should do.

8.5.8 Noisiced

NOISICED is "decision" spelt backwards. The letters spell out the eight steps in making a decision. An example is coming to a decision about a job move.

N - Needs: Why do I need to move?
O - Objectives: Does the new job help me achieve my ambitions?
I - Information: Do I have all the information I need? What are the key pieces of information?
S - Strategy: Does this move fit in with my life's plans?
I - Investigate: Check out other possibilities.
C - Choosing: What are the steps I need to take to make the move?
E - Ego states: How do I feel? What do I think? What should I do?
D - DECIDE.

8.5.9 On the Hoof

Some decisions can be made on the hoof, or as we go, as long as we are prepared to learn from wrong decisions and adjust our course in the process. David Kolb's experiential learning model provides a useful five-stage plan for "on-the-hoof" decisions:

1. take the decision to act on the best evidence to hand and with a clear view of what our overall objectives are
2. now, act. Do so confidently and with commitment.
3. assess the results. Has the decision brought us nearer our objectives? If not, why not?
4. think about it. What can we learn from the results?
5. devise a theory for use next time. From what happened, what do we now know that we didn't know before?
6. now take another decision but with the wisdom of having learnt from the previous experience and go round the cycle once more.

8.6 Instinct

No matter what method or model we use to make a decision, there comes a moment when we know instinctively whether the decision is right or not. Many of the biggest business deals ever taken were taken on instinct. But they were rarely taken on a whim. Intuition works best when we have done the groundwork, accumulated plenty of expertise and researched the field. Intuition is no substitute for hard work and planning. Take time to cultivate your intuition for it is never wrong and has your best interests at heart.

8.7 Don't Decide Without Acting

Eric Aronson tells this riddle: If 5 birds are sitting on a wire and one of them decides to fly away, how many are left? The answer is five. One bird's decision to fly away does not mean it did!

Theodore Roosevelt said that the worst thing you could do when you have to make a decision is to do nothing. Even if you make a wrong decision, the very making of it and the learning from it are steps forward. As Frederick Langbridge added, "If you don't follow through on a decision, someone else will pick it up and use it. When you make a decision, jump in with both feet, don't just stick your toe in the water. Be daring, be fearless, and don't be afraid that somebody is going to criticize you or laugh at you. If your ego is not involved, no one can hurt you."

8.8 Keep Your Decision under Review

Decisions are a mix of what we currently want (goals); what we currently know (information); what we believe (outcomes); and what we can do (actions). There is no guarantee that any of these will stay the same or that they will come right. No decision is perfect. This is because half-way through the implementation of a decision we may realise we don't want to achieve the goal after all. After taking a decision, we may stumble across more information which, had we had it before, would have totally changed our decision. A successful decision depends as much on motivation and skill in implementation as on getting it right.

Nobody who regularly makes important decisions affecting the lives of others will tell you hand on heart that they get it right every time. Decision-taking is more of an art than a science. But practice, and learning from our results, may at least take us closer down the road to a 100% strike rate.

8.9 Key Points

1. The best decisions are hot-iron decisions made just at the right time.
2. A right decision is one which meets your aims and resources and which you are prepared to act upon.
3. The time to worry about a decision is before you take it, not afterwards.
4. You should only take a decision if it can be turned into immediate action.
5. You should only take a decision if you have no alternative.
6. Use a decision-taking model such as the Six Thinking Hats to get all angles on an issue.

9 Problem-Solving

Problem-solving is the most widely-known and widely-used application of thinking skills. Problems can be any situation where we are prevented from moving forward or reaching our goals. Problems are caused by lack of information, lack of insight or lack of ideas. For many, a problem is a reason to give up. But for those with thinking skills, a problem is a challenge to be overcome.

9.1 The Problem with Problems

People usually respond to a problem in one of 3 ways:

1. they get uncomfortable and wish it would go away
2. they feel they have to come up with an immediate, and correct, answer
3. they look for someone to blame.

Most of us find facing a problem a problem. We think something bad is going to happen. The goal of any problem-solving process is to make us competent to handle conflict.

"How you look at a situation is very important, for how you think about a problem may defeat you before you ever do anything about it. When you get discouraged or depressed, try changing your attitude from negative to positive and see how life can change for you. Remember, your attitude toward a situation can help you change it. You create the very atmosphere for defeat or victory." (Franco Harris)

9.2 The Classical Approach

The classical approach to problem-solving is a step-by-step approach which makes use of the analytical style of left-brain thinking and the synthesis style of right-brain thinking. Here it is:

1. Become aware of the problem.
2. Define the problem and define the criteria for a solution.
3. Survey what you know (the clues).
4. Advance possible solutions using different approaches to thinking, including sounding others out.
5. Test them, either in your head, on paper or in practice.
6. Identify the best solution and carry it out.

The Classical Approach works best in stable environments where there is a known body of information about the problem and time to solve it. In unstable environments, eg those undergoing a large amount of unpredictable change, information may be uncertain and a decision needs to be made swiftly. In these situations, you may need to use some less conventional approaches to problem-solving such as the following.

9.3 Do Nothing

The psychologist Carl Jung suggested that we sometimes go looking for problems where none exist. Certainly some solutions to problems can cause more pain than the original problems. When a new situation arises that you think is a problem, ask yourself:

- is this a problem or just a new situation that we hadn't expected?
- is this a problem or an opportunity in disguise?
- if it is a problem, could I change my goals and plans to stop it being a problem?

"For every problem under the sun,
There is a remedy or there's none.
If there is, try and find it;
If there isn't, never mind it."

9.4 Take Your Time

Tim Hicks, founder of mediation business consultants Connexus, says that people are born problem-solvers but don't realise it. Our fear of conflict means we rush into solving problems when it is infinitely better to take our time. By being patient, we are willing to put the solution at the end of the process rather than at the beginning. It also means being willing to live with "life unresolved", not always a comfortable thing to do. Hicks says a problem is like a curve in the road where we can't see the straight road ahead. Take the bend too fast and you'll come a cropper. Slow down and you'll make it fine.

9.5 Sleep On It

We don't understand the full workings of the mind but we do know that forcing solutions can sometimes block creativity. This can sometimes happen when we are under time pressure or working with limited resources. The possibility of seeing our plans and goals ruined presses on us and, instead of freeing up our creativity, freezes it instead. By relaxing, going away and doing something else, or sleeping on it, the subconscious mind can work on the problem by itself and come up with an answer.

9.6 Attack the Problem

Attacking a problem is a way to tell yourself that you are not going to let a problem beat you. It is a good way to deal with people problems which are often ignored or dealt with only half-heartedly because we fear upsetting someone. If we battle fair and square with a problem and marshall all our resources to defeat it, we are sure to beat it. One way to do this is to use more than one approach, for example, first sleeping on it and then, if that doesn't work, analysing it, and then, if that doesn't work, using a creative approach.

9.7 Two Heads are Better than One

Most people like to help others with problems and there is usually a benefit in two heads being better than one. A synectic, or problem-solving, group following good groupworking guidelines can offer you quantities of ideas.

Use the following four questions to get the group going:

1. How would others solve this problem?
2. How did we solve this problem in the past?
3. How would we solve it if we had a magic wand?
4. What other situations is this like?

9.8 Occam's Razor and the Five Whys

Dissecting a problem into its barest essentials, razor-like, was a method advocated as far back as the 14th century by the scholar William of Occam. Hence, reducing a problem to its essence is known as Occam's razor. An example of Occam's razor is that, if you see four hoof-prints in the dust, you should start with the assumption they were made by one horse, rather than two standing on their hind legs. A similar approach is used in modern Japanese industry. When looking at quality defects, they ask at least five consecutive "why?" questions to get to the real cause. Let's say that customer Smith is getting the wrong product.

Why 1: Why is customer Smith getting the wrong product?
Because manufacturing are working on a special spec for customer Smith.

Why 2: Why?
Because the Sales Director spoke to the Production Director and by-passed the office.

Why 3: Why?
Because it was a rushed order and would have taken too long to go through the office.

Why 4: Why?
Because all orders are dealt with in order not by priority.

Why 5: Why?
Because the previous Production Director made this ruling and it has never been challenged.

Jack Foster tells the following story about getting back to basics in his book "How To Get Ideas".

An old office building with just two elevators now had too many workers who spent a lot of their time having to wait for the elevators to arrive on their floor.

The manager asked people using the elevators what the problem was with a series of Why-type questions. Why do you get annoyed at having to wait? Why are the elevators slow? Why can't you change your breaks? And so on. From the replies, she considered her options.Extra elevators? No room. A new stairwell?Far too expensive. Staggered starting and finishing times to reduce the crowds?Unable to fit in with office hours and cover. What did she actually do?

Well, first she realised that people weren't particularly bothered about having to wait (especially when returning to the office!). Nor were they prepared for the disruption of re-designing the system. What she found was that the biggest bugbear was that people had nothing to do while they waited for the elevators. So she installed ceiling-to-floor mirrors. Result? People were quite happy to wait as they didn't mind taking a peak at themselves and the others waiting with them.

How you look at a situation is very important. Many people see unexpected situations as problems and are defeated before they start. Above all, don't get discouraged or depressed. The unexpected situation may be telling you that there is a better way to get to your goals than even you had thought. Accept the situation, welcome it, be interested in it and you're halfway to solving it.

9.9 Key Points

1. A problem should be seen less as a threat and more as an opportunity.
2. The most important factor in determining whether you will solve a problem is your belief that there is a solution out there waiting for you.
3. Stating clearly what the problem is may lead you straight to the solution.
4. Problems are usually solved if you refuse to give up.
5. If a problem seems intractable, re-word it and look at it in a different way.
6. Reduce a problem to its bare essentials by asking successive "why?" questions.

10 Innovation

The giant packaging company 3m expects every one of their staff to spend 15% of their time on innovating. This is not just innovating about new products and services but about new systems, new methods, and new procedures. That's because in a fast-moving world, where people expect things to get better and better, and cheaper and cheaper, innovation is the answer to creative solutions and the route to getting ahead of the competition. The following are seven pathways to innovation.

10.1 Create an Innovative Climate

GoranEkvall of Lund University in Sweden has defined three conditions needed for a climate of innovation. They are: trust, dynamism, and humour. Ekvall came to this conclusion as a result of his research into the most innovative businesses in Sweden. One of Ekvall's case studies was a Swedish newspaper where the team working on the women's section consistently outperformed all the other teams. The reason? Quite simply, this group trusted one another, had a high level of energy and shared a common sense of humour.

10.2 Keep Your Eyes Open

Some of the major discoveries of the past have arisen by pure chance. In a lecture in 1822, the Danish physicist, Oersted, chanced to put a wire conducting an electric current close to a magnet and discovered an electric charge, thus paving the way to the discovery of electricity. In 1889, Professors von Mering and Minowski were operating on a dog when an assistant noticed a swarm of flies being attracted to the dog's urine. When Minowski tested it, he found that the urine contained sugar. This was the breakthrough step towards a control drug for diabetes. In 1929, Alexander Fleming noticed that a contaminated culture of bacteria had stopped growing. This observation led to the discovery of penicillin and anti-biotics.

10.3 Dreams and Daydreams

We know from research that while we all dream on average four or five dreams a night, most of us are poor at recalling and making use of our dreams. It is a good idea to keep a notebook handy beside the bed to jot down our dreams. Goodenough found that those who do recall their dreams are less inhibited, less conformist and less self-controlled than those who don't: in other words, dream-recallers are typical creative thinkers.

10.4 Develop Washing-Up Creativity

According to the Roffey Park Management Insitute, most flashes of inspiration come to people when they are away from work and not forcing their conscious brains to find solutions to their problems. For some, ideas come while mowing the lawn or taking the dog for a walk or playing golf or waiting on a railway station. For Isaac Newton, it was an apple on the head while sitting in the garden. For Archimedes, it was in the bath. For others it's while doing the dishes; that's why Roffey Park calls it "washing-up creativity".

10.5 Make New Connections

Making new connections between existing features of your product or service is a popular way to innovate. Akio Morita, chairman of Sony, said that he invented the Walkman because he wanted to listen to music while walking between holes on his golf course. His team simply put together two seemingly incompatible products: a tape recorder and a transistor radio.

Making new connections by forcing relationships can be a useful way to pick up on unconnected suggestions in a brainstorming session.

An ailing chain of hardware shops held a brainstorming session amongst its staff in which the following two suggestions, one serious and one silly, came up:

- No 73: "set up a 24-hour tool repair service"
- No 108: "put a trapdoor in the pavement so passers-by would have to drop in".

After some discussion, the group proposed the idea of installing an oversized letter box in the shop front. Through this customers could drop any tools at any time of the day and night to be repaired and sharpened with a guarantee that they would be ready for collection within 4 hours of the shop opening in the morning.

10.6 Necessity is the Mother of Innovation

Necessity is a great spur to innovation. Take, for example, writing paper. The Chinese had already made paper from rags around the year 100 BC but because there was no need for it, nothing came of it. When it did reach Europe in the Middle Ages when writing became all the rage, the supply of rags and worn-out fabric soon dried up. That's when a French naturalist made the discovery that wasps made their nests by chewing wood into a mash that dried in thin layers. Within 100 years, all paper was made using the idea of wood pulp.

10.7 Test, Test, Test

Product testing is the way most inventors and organizations go about innovation. It may not be the quickest route to success, but it is often the surest. Jonas Salk, for example, discovered the polio vaccine by spending most of his time testing and testing and continually finding out what didn't work. Thomas Edison, the inventor of the filament light bulb, recorded 10,000 experiments that were complete failures. But he was able to keep going because, as he said, he knew 10,000 ways that it wasn't going to work. As Woody Allen said, "If you're not failing every now and again, it's a sign you're not doing anything very innovative."

10.8 Adopt and Adapt

One relatively easy approach to innovation is to notice how others deal with problems and then adapt their solutions to your own. It's known as "adapt and adopt". It's what watchmakers Swatch did when they realized that the more reliable their watches became, the less people needed to replace them. Their solution? Borrow an idea from the world of fashion and collections by turning their watches into desirable fashion accessories. Now people buy Swatch watches not just to tell the time but because it's cool and trendy.

10.9 Take Lessons from Nature

If you really want to be inventive, you can't beat nature. The world of nature gives us an endless supply of prototypes to use in our own world. Take Velcro, for example. Velcro was patented by Georges de Mestral in 1950 after he returned from a hunting trip covered in tiny burrs that had attached themselves to his clothing by tiny overlapping hooks. De Mestral quickly realized that here was an ideal technique to fasten material together. A whole new way of doing things was suddenly invented.

The history of the world is the history of innovation. Thomas Kuhn called each acceptance of a new innovation a "paradigm shift". For once a new innovation becomes accepted, the world has changed forever and can never go back to the way it was.

10.10 Key Points

1. Innovation in products, services and ways of working is an imperative in the modern global economy.
2. One of the keys to innovative thinking is to have a creative sense of humour.
3. Many of the most innovative ideas come when we are away from the workplace thinking about something else.
4. Some of the best inventions come from combining existing products in new ways.
5. To be successful with new ideas, you should expect to fail on a regular basis.
6. Many of the most remarkable discoveries were made by imitating the natural world.

11 Web Resources on "Thinking Skills"

The following instantly-accessible website resources provide more in-depth information on some of the tips, techniques, and features in this book.

Take the ManageTrainLearn e-course on Thinking Skills for free here:
http://www.managetrainlearn.com/product-info/thinkingskills-ecourse/

Subscribe to the MTL "Innovative Thinking" online course here:
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Train others with a wealth of material in your copy of the Thinking Skills e-manual here:
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