Cover Page

A Little Book of Individual Problem Solving Techniques

Or

Making Sense of a Non-Sensical World

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A Note About UK v US English

“The British and Americans are two people separated by a common language” said Winston Churchill. Some words are spelt differently “colour and color”, and some words have different meanings – “momentarily” for instance. Grammer has its differences as well with the US collective nouns as singular, whereas in the UK collective nouns are usually plural.

If you really want to learn how the differences between the 2 forms of English can cause serious problems, then I refer you to a book published a few years back called “Masters and Commanders” – not to be confused with the Russell Crowe film “Master and Commander”. One is concerned with the wartime relationship between the US President Roosevelt and the British Prime Minister Winston Churchill, and their respective Chiefs of Staff (head of the Armed Forces); the other is a film set at sea during the Napoleonic Wars of the early19th century.

Spelling Mistakes

If you find any spelling mistakes, please email me

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URLs

Because you can’t click a shortened URL in a paper-based book, in the way that you can an eBook, I will type in full, any URLs required. RussellCollinsArt.com is my original domain that I set up when I became and aspiring artist but is now moving to be “MY” personal web site.

There are numerous links in this book that take you to websites that will explain, in more depth, (if you are interested), many of the techniques and concepts mentioned here.

The full email address of my website is **www.russellcollinsart.com** and will then be followed by a short identifier.

I have linked this book to a page on my website where you can see further information, examples and case studies on the subjects described. This page is at:

www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

Why not pay a quick visit now to familiarise yourself with it?

The Author Russell Collins - Me, Myself and I

A degree in Civil Engineering from City University in London, then 18 years in the Construction Industry, first making sure that very large buildings went together the way the drawings said they should have done. Then a few years in the UK, Spain and Saudi-Arabia making sure that everything was planned out and occurred on time. Lots of problems that required creative ways to solve.

At the same time, I had a parallel career as a Territorial Army (now Army Reserves) Sapper, NCO and Officer with The Royal Engineers. I started off in Commando Squadron (Sapper equivalent of an Infantry Company) – providing combat engineer support to 3 Commando Brigade and ended up running Commando Training for the squadron. Then it was off to a Field Regiment providing combat engineer support for the Army and finished off in Bomb Disposal. Lots of problems of a different sort that required solving.

It was back to City University in my mid-30s to do an MBA with a difference. Rather than force feed us case studies and financial reports to decipher, our course was Systems-Science based and very problem solving related. We were taught/trained to look at the whole situation at the same time, not just a particular part of it in isolation from the rest at any one time. I got to learn lots of interesting ways to analyse complex situations and how to help resolve them.

John Major's recession meant that I spent a good year scraping a living working in a clothing distributor warehouse, the Royal Mail sorting office, and in a recruitment and advertising agency. I also spent a 3-month attachment with a Regular Army Headquarters.

Then followed 3 years at Henley Management College, one of our main business schools, where I ran the Innovation Research Centre. This was a great time. I had to read loads of papers about creativity and innovation, was involved in the creation of college modules on creativity and innovation. I was involved with lecturing foreign students in other countries who were doing the distance learning modules of Henley

Then it was a full-time self-employed career running a small business in the Events sector. I became the 2nd largest non-USA distributor for an American manufacturer of audience voting systems similar to those used in "Who Wants To Be A Millionaire" when they "Ask The Audience". Eighteen great years doing that cam end to an unfortunate end when I went into business with someone, with hindsight, I shouldn't have done

Now, I'm a franchisee with a company that is a specialist domestic cleaning organisation (**www.ovenclean.com**) – I can assure you that women stop me in the street and ask me for my phone number, - an artist who runs painting nights in pubs and restaurants, now a book writer, and still an entrepreneur.

Introduction

I was originally going to call this book something like “A Little Book of Personal Problem Solving”. But that made it look like it was some self-help book that would teach you about affirmations, getting a healthy lifestyle, changing jobs to get more money, sort out your relationship problems, make better use of your time etc. I thought though that I could do something better.

We now live in a complex world, but when I was born in 1956, life seemed so much easier, or it appeared to be. Dad went to work at 8.30 to start at 9, kids WALKED to school, and Mum stayed at home doing Mum stuff. Kids left school at 3.30ish and either played football in the park, got involved in a fight, or went home to Mum, who often didn’t work. Dad left work at 5 and got home at 5.30 with tea on the table at 5.45. In fact, my early life mirrored the events of the lovely TV programme “Call the Midwife”.

Ok, I didn’t live in the East End of London, but we did have a family doctor who smoked during your visit to him, offered your Mum a cigarette when she took you to see him, AND did house calls. The family doctor also gave blunt and down to earth advice as well. I have a pathological hatred of custard, put it in front of me and I can be very “sick”. My Mum took me to the doctor and said that the school asked her to bring me to see him as every time I had to eat custard, I was “sick”. The good doctor wrote a letter to the school that said: “If understand that Russell Collins vomits every time he is made to eat custard. Don’t make him eat custard”.

The life above was not for me. My Dad was Royal Navy for 21 years, so he was either at home or he wasn’t. Mum also worked and sometimes she dropped me off at school on the back of her motor scooter on the way to work. I still had to walk home though and let myself in - I thought I had it tough. Life is rather more complex now and many people don’t have the tools, or the time to try and sort out that complexity.

I thought that I could review some of those problem-solving tools and techniques that I learnt over the years into a little book. That book could be printed by Amazon and distributed by them as well. Maybe it could make me rich – no harm in trying.

The aim of this book is to help the reader to make complex situations simpler. To help them look at issues/problems in new ways and hopefully go some way to help people make their lives a little easier, whether it is in a personal area, or a work-related area. It will cover areas such as creative problem-solving tools and techniques, idea generation techniques, and modelling techniques.

Every so often I will throw in little stories and anecdotes I have picked up, read about or experienced personally, and I hope they liven this book up a bit.

This book is aimed at helping the INDIVIDUAL make sense of a non-sensical world. So, that is why this book is entitled A Little Book of INDIVIDUAL Problem-Solving Techniques.

I hope to expand the scope of this book and write a second book that does the same thing for groups of people.

I don't like the term businessperson, so will use the terms businessman or businesswomen, using one gender term automatically includes the other gender term.

A WORD OF WARNING. Complex Problem Solving takes time. Some issues you can resolve almost immediately, others can take hours of work spread over a few days, and days of work spread over a few weeks.

Now read on!

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Chapter 1 An Introduction

There are many books available that say that they can help you solve problems using Creative Problem-Solving techniques, so what makes this book different? I think that most of the books on the subject are too academic in their approach. This book though, is designed to be a practical book that shows how you as an individual, can use simple techniques to help you sort out the difficult, time-consuming problems that you face whether as an individual, or a small businessman/woman.

A Director of a company could be trying to understand how one of the markets the company is operating in changing because of new technology, and how that new technology will affect the company.

A small businesswoman could be trying to grow her business in some way. She could be looking to introduce new products or services, or by demonstrating the added value she gives, so that she can charge more than her competitors.

An individual could be a single parent trying to juggle life's pressures involving work children, social life (or lack of it), career and financial issues.

Whatever the problems you face, this book is designed to help YOU, the individual, make your life a little easier.

How to Use This Book.

This is a book for practical use and a little bit of practice, as you read it, will help you understand how the techniques work. Before you go any further, get a piece of paper and think of a problem area that you know of. Write down on that piece of paper 10 – 20 issues relating to that problem area. As you go through the book, take a few of those issues and apply some of the techniques I describe. If you can't think of a problem area, ask yourself the question "What is wrong now with my country?" Please, no more than 10 – 20 issues.

Kit List.

You need some materials and equipment and most of it will be stuff that you either have available or can easily buy at a local shop or store. Although the techniques described in this book can be used with groups, this book is aimed at INDIVIDUAL problem solving - you, the reader, analysing problem areas by yourself. This means that you can operate at a smaller scale, such as at your desk, or in your office, rather than a meeting room.

You only need low-tech equipment and materials, but you can use high-tech equipment and materials.

Low-Tech Materials and Equipment.

Post-It™ Notes. A few words about Post-it™ Notes by 3M. Post-It™ notes have been around for decades now and although the term Post-it™ note has now been taken to mean some sort of re-stickable paper, the term Post-it™ is a registered Trademark and should only be used when being used to describe the real Post-it™ Note. Every time I write the words Post-it™ Note, I need to add the Trademark sign™ and that gets very tedious. So, I shall only use the word Note (with a capital N), and this will signify anything that is, or looks like the original Post-it™ Note.

A Surface to Put Things On. A large area on which to stick things. It could be a fridge, a wall, a white board (preferably magnetic), a flip-chart sheet, a large sheet of paper made up of flip-chart sheets taped together that you can fold up, put away and come back to later. It could be vertical such as fastened to a wall, or horizontal and laid on the table. I'm going to refer to whatever you use as a surface, as "**The Board**".

Things to Write With. Different coloured pens for instance, magic markers (be careful as they can bleed through paper to the surface below), crayons, pencils. Make sure the magic markers you use are erasable as you will be changing a lot of things.

Things to Write On. Sticky Notes of different sizes and colours – the most popular colour is yellow, so get lots of these (but you will need some different colours such as red, blue and green), paper sheets, thin card sheets. If you have a magnetic white board then you can buy thin magnetic card or paper sheets that you can cut to shape and size and use on the magnetic whiteboard.

Additional Nice to Have Items.

Magnetic Whiteboard. A whiteboard with a magnetic surface so that you can stick magnets on it. No need to stick and unstick bits of paper, but slide things around.

PVC type whiteboard sheets. You can buy a product known as Magic Whiteboard ™, which is a form of reusable, impervious, vinyl sheet that sticks to a flat surface, such as a wall, by using static electricity.

Hexagon shaped paper and notes. Hexagons are good problem-solving tools as their 6-sided shapes make them easy for the brain to cluster – more on this later

Scissors. To cut things with.

Post-It™ glue., Yes you can buy Post-it™ glue sticks that you can apply to the back of paper or card, and place and remove repeatedly on a surface without leaving a residue.

High-Tech Equipment and Materials.

You might have some of these, so why not use them.

Computer. It could be a notebook, or a PC equipped with Microsoft Office™. PowerPoint can be used as your board, and this means that you can use many of the inbuilt PowerPoint features, such as the different shapes available, as problem solving aids.

Projector. If you have one, connect it to a computer with an HDMI cable, or wirelessly, and you have a bigger board.

Touchscreen Interactive Whiteboard. Connect it to your computer and it as your board.

Portable Interactive Whiteboard. If you have a projector, then combine it with a portable interactive whiteboard, such as a Mimio, and you can turn any surface into an interactive whiteboard.

Widescreen TV Set. Connect your computer to your widescreen TV set, either by an HDMI cable or wirelessly. You can show your computer screen on your widescreen TV set.

Multiple Monitors. Multiple monitors attached to your computer means that you can increase the width of your screen by spreading it over 2 or more screen. Great for gaming as well.

Chapter 2 Problems or Symptoms?

I'm going to go just a little bit academic here as I am using several terms and definitions.

The Mysterious Case of the Radiator Coolant Levels.

You realise that you haven't checked your car radiator coolant level for some time. You check it and see that the level is below what it should be, so you top it up to the correct level using rather more coolant than you expected. You aren't really bothered about it but resolve to check more frequently.

You forget about it for a few weeks, then you remember to check the level again and you find the level has dropped again. You top up the level and resolve to check more frequently - again. You remember to check most weeks, and over time, the level drops again. You think you have a leak somewhere, but don't know where, so you buy a small bottle of radiator leak sealer, pour it into the radiator and hope that does the trick.

Everything is fine for a few weeks, and you check your coolant levels every week. You then find that the coolant level has dropped quite dramatically, and you seem to have a dried puddle under your car. Maybe now is the time for you to take your car to the garage to let a specialist look at it.

You take the car to the garage and a mechanic tells you it could be one of several things and he will look. 1) It could be a small split in a radiator hose that is leaking coolant and can be replaced quickly for a low cost. 2) It could also be a hole(s) in the radiator leaking in several areas and needs immediate replacement at a medium cost, as it could fail suddenly; another tin of radiator leak sealant might give you a little more time though. 3) Your water pump needs replacing at a reasonable cost. 4) The head gasket is leaking coolant into the cylinders and the work needs to be done ASAP before the engine block needs replacing at a very high cost.

The mechanic looks, explains the problem to you, and you must decide what to do next.

What Exactly Is a Problem – An Academic Explanation?

Firstly, there is a gap between what things should be, and what they are – a problem gap. In this case the radiator coolant level should remain constant, but it doesn't.

Secondly, there must be an awareness that a problem gap exists. If there is no awareness of a problem gap, then no problem exists. Take the car example mentioned earlier, you hadn't checked your coolant level for some time, so you weren't aware it is losing coolant – you aren't aware you have a problem. Therefore, in your mind, you don't have a problem.

Thirdly, there must be a need to solve the problem. Using the radiator example; if you don't resolve the problem of low coolant levels then there could be damage to the car which could be expensive to fix. You initially resolve the problem of low coolant levels by adding coolant fluid – problem fixed. You eventually check coolant levels every week, adding coolant when necessary.

Another issue to consider, is that the cost of solving the problem, must be less than the cost of the problem, and this must be considered over time. If the problem is costing **X** per year, and the cost of solving the problem is 3 x **X**, then the problem is only worth solving if the benefits of solving the problem will extend for 3 years or more, to make the savings 4 x **X**.

Fourthly, the size of the problem gap should be measurable in some way. You notice over time that the amount of coolant you are adding every month is increasing and you think you might have a major problem with the car that needs specialist help.

Fifthly, you need to have the ability and resources to close the gap. The mechanic tells you the problem and you must decide what to do. You probably can't do it, but the mechanic can.

Problems Or Symptoms?

What exactly is the situation, do you have a problem? Consider that what you notice first is more likely to be a symptom of the problem, and you need to delve deeper to discover the actual problem that is causing the symptom. You might see the reduced coolant levels as the problem, but the reduced coolant levels are the symptom of the problem, and by adding more coolant you are treating the symptoms. The problem is a fault somewhere in the engine cooling system of the car. If you keep treating the symptoms and don't address the problem, then things usually will only get worse.

We often mix up symptoms and problems. The problem in the business environment might be seen as falling profits. Falling profits are not the problem, but a symptom. Falling profits could be due to falling sales due to a poor marketing plan or better competitive product. Falling profits could also be due to high warranty costs, increased interest charges on large outstanding loans, manufacturing machinery breaking down, or numerous other causes.

Having said that, there are situations where treating the symptoms can be treated until the problem goes away. There is a Japanese fish delicacy called Fugu. It is the flesh of a particular Puffer-Fish, and the meat is supposed to be superb. The closer the meat is to the liver of the fish, the more divine the taste, but the greater the danger of being poisoned. The problem is that the liver is poisonous, the poison of the liver works by paralysing the body muscles. You die through suffocation as your chest muscles stop working whilst you remain conscious. There is no antidote to Fugu poison, but you can be kept alive "mechanically", whether by machine such as a ventilator or iron lung, or CPR until the body has metabolised the poison from your system by

natural means. The symptoms of Fugu poison, paralysed muscles, are treated until the problem goes away.

You could properly identify the problem and put measures in place to fix the problem, but the fix might take a while to work through the system. The symptoms though might be alleviated in some way though.

Recognise the difference between symptoms and problems causing the symptoms. Doctors do it all the time, you go to the Doctor with symptoms, and hopefully they will diagnose the problem and deal with it in some way.

Planned and Unplanned Problems.

You don't have to have things going wrong to have a problem, you might have a situation where you need something that you don't have now, but know you need. It's a gap between what you have, and what you need.

An example of a **BUSINESS PLANNED** PROBLEM might be that you need to develop a marketing plan for a new product launch. You don't have it yet; you need it by a certain date, and you have set aside time to do it.

An example of a **PERSONAL PLANNED** PROBLEM might be that your car is coming up for an MOT. You notice that you have a tyre that is worn to the level that your car will fail its MOT test. You make a booking to have the tyre replaced.

An example of a **BUSINESS UNPLANNED** PROBLEM could be that you are a manufacturer of high-quality oven meals, and that you suddenly start getting numerous complaints about one of your bestselling meals. You need to find the problem and fix it.

An example of a **PERSONAL UNPLANNED** PROBLEM might be the radiator example stated above.

Problems and symptoms are closely entwined, and it isn't clear which is which. We need to look at all issues and factors related to the problem area, analyse them to see what the symptoms are, and what the problems are. We then need to resolve the recognised problem area. This should reduce, and hopefully remove, the effect of the symptoms. It would also be helpful if, at the same time, we can reduce the effect of the symptoms until the benefits of solving the problem have worked through the system.

This where Creative Problem-Solving tools and techniques can be used.

Chapter 3 Introduction to Creative Problem Solving

The important word in Creative Problem Solving is the word "**CREATIVE"**. Being creative, or the act of creativity, is about using your imagination to come up with new ways of resolving, or solving, a problem. It requires you to think of things you never thought before, without judging those thoughts you have. Yes, you will come up with wacky ideas that some people will laugh at, or say cannot be done, but sometimes those wacky ideas become reality and produce a successful solution.

Memory and The Magic Number 7, Plus or Minus 2.

Research carried out in 1956 argued that the human mind can only hold, and process, in short-term memory 7 + or – 2 items of information at any one time (Miller's Law) – yes, you can fill up part of your short-term memory. Bearing in mind that life is getting more complex, this gives problems of comprehension when dealing with complex problems where many items of information impact upon each other. I'm going to call those items of information "**ISSUES**", and the type of issue they are, will depend on the context in which they are used. If we are looking at problem areas, then they will be problem issues for instance. If they are issues related to solutions, they are solutions issues.

Funnily enough, the film **Inside Out** gave a very good explanation about how memory works and what can be done to improve it.

Therefore, we need to get a little creative in how we look at the complexity that affect us, whether in raising those issues, and/or seeing the effect they have on each other. We deal with this complexity by writing these issues down on something like a Note, and sticking them to a large, surface which we call our board. We can then move those issues around to put them in some sort of order. Writing things down on Notes and putting them on our board means that we don't need to fill up our short-term memory.

The Creative Problem-Solving Process.

Divergence and Convergence. Creative problem solving revolves around two simple concepts – Divergence and Convergence. Divergence refers to the raising of issues affecting your situation and Convergence refers to the reducing of those issues raised, to a more manageable number of recognised important issues that must be acted upon.

Problem Solving Model. A simple model of problem solving involves 4 factors: Problem identification, development of alternative solutions, choosing the solution to implement, putting the solution into practice.

Further problems might arise from the implementation of the solution, so the problem-solving process can be said to be a circular one.

When analysing any situation, whether a problem area, or an action area we need to raise as many issues as we can. Remember that we are looking here at INDIVIDUAL problem-solving methods and techniques and by this, I mean techniques that can be used by an individual, YOU, working to great extent by yourself, trying to solve a problem.

GROUP problem solving, involving others as part of a team, requires a different approach to problem solving, and this will be the subject of a follow-up book.

An issue with you, THE INDIVIDUAL trying to solve a problem is that YOU might not know much about a specific problem area, so might need to get input from others who do. Asking specialists in certain areas for advice about a subject that you don't understand is recommended. You are asking for their specific advice, but you still make the decisions.

The 4 Factor Problem Solving Model.

Problem Identification.

There is something you aren't happy about, but don't know what it is. You think things could be better than they are, but you don't know how. You think you are doing all the right things, but things aren't going right.

First of all, you go through a process of divergence by raising all the issues that you think are related to the problem situation. You then go through a process of convergence, in several different ways to reduce the number of issues to a smaller number of important issues. You look at the effect of those issues on each other to see if you can find the main issues that are driving others. You will frequently find that the issues you think are the most important are just the most visible issues – the symptoms and not the causes or drivers. I repeat; diagnose the problem.

By the end of this phase, you should have a good idea of the actual problem issues, and what their effect is on each other (if any).

Alternatives Development.

This is where you need be creative with your thoughts about resolving the problem. Once the problem has been understood and evaluated, you can then devise alternative solutions to the problem. You diverge by raising activities that could be carried out to help solve the problem. You then go through a process of convergence, in several different ways to reduce the number of activities to a smaller number of important/feasible activities from which you can develop your plan. You look at the effect of those activities on each other to see if you can find the activities that you can implement in such a way, "a correct order", that they can help the implementation of other activities.

By the end of this phase, you should have a good idea of activities that can be done to overcome the problem.

Alternative Selection. From the activities generated in the previous part, you develop several different alternative solutions or plans that you could implement. You consider each plan against the criteria you set for a successful plan to choose the best plan. You could also pull the best activities out of alternative plans to see if you can combine them to produce a better plan than all the alternative plans.

By the end of this phase, you should have developed a plan, or plans to overcome the problem.

Stress Testing the Plan. Having developed a plan, you then need to stress-test it. The future isn't going to work as you want it to work and something is bound to come up that either you never thought would happen or didn't even consider happening – the Unknown Unknowns. It could be a major financial crash such as the financial crisis of 2008, or it could be a personal or family illness or tragedy that blows you completely off course – pandemic anyone? How future proof is your plan?

By the end of this phase, you should have a good idea of what could disrupt your plan, and a few ideas on how to mitigate the disruption.

Solution Implementation. This involves the implementation of the chosen solution and monitoring its progress. The monitoring of its progress might raise some more problem areas that need to be resolved. The new problems might be related to the original problem, or they might be new problems related to the solution implementation. It is important that, in this stage, that any problems are properly evaluated – the solution could fail, not because it was a bad plan, but because it was implemented badly.

By the end of this phase, you will hopefully have mostly resolved the problem area.

Chapter 4 Defining the Question.

Historical Quotes.

But first of all, some quotes from history, and an interpretation of them, with my comments in *(italics).*

Donald Rumsfeld, former Defence Secretary of the USA talked about truths, and said at the time of 9/11; "There are known knowns, things we know that we know *(This really should be the things we think we know, because we could be wrong)*; and there are known unknowns, things that we know we don't know *(An individual might know what they don't know, but a group of problem solvers might have the information buried in the depths of their memory).* But there are also unknown unknowns, things we do not know we don't know *(These can be called the Black Swan events; an unpredictable event that is beyond what is normally expected from a situation and that has potentially severe consequences. Black swan events are characterized by their extreme rarity, severe impact, and the widespread insistence they were obvious in hindsight." These events are never expected or planned for, but then blindingly obvious after the event.).*

This ignores another truth on the Known/Unknown matrix and that is of the "Unknown Knowns", and we go to Mark Twain for a comment on that.

Mark Twain said, "It's not what we don't know that gets us in trouble. It's what we know for sure that just ain't so" suggests that it is dangerous to hold onto certain beliefs and ideas as absolute truths, especially when those beliefs are not based on solid evidence or are proven to be false.

Mike Tyson. It was the famous global analyst and trend forecaster, boxer and ear biter Mike Tyson, who once said: "Everyone has a strategy until they get punched in the face."

To Be or Not to Be – What Is the Question?

If you recognise you have a problem, then you have a question that needs to be answered, and the first question is "What is the problem?" Those of us who read Douglas Adams' "Hitchhikers Guide to the Galaxy" will remember that a group of hyper-intelligent mice built a massive supercomputer, called "Deep Thought" to find out the meaning of life, the universe and everything. Deep Thought, after 7.5 million years, gave the answer as "**42**".

The hyper-intelligent mice were very disappointed with the answer, but Deep Thought told them that the question was vaguely formed and if they wanted to find the correct question, they would need to build a bigger super-computer. The mice did this and called this new Super-Computer "Earth".

After 4.5 billion years Earth discovered the question to which the answer was 42. The 2 heroes of the book, Arthur Dent and Ford Prefect, discovered that the question to which 42 was the answer, was “What do you get when you multiply 6 by 9?”. This rather confused the mice, and Deep Thought stated that the answer can be whatever you want it to be, and the answer won’t make sense without knowing the context of the questions.

Just because you have a problem area doesn’t mean that things are going wrong, they might just not be going as well as they should do. Yes, you could be a successful engineering company trying to speed up its assembly process to cut costs, or a successful ready meal manufacturer trying to make the high selling Peking Crispy Duck ready meals go a bit crispier when cooked. Both companies are doing well, they could do a bit better though.

Possible Problem Situations.

This section will give some examples of problems that need to be resolved by individuals – all suggestions welcome.

Chapter 5 Problem Identification - Issue Generation

I am going to run through a generic problem situation over the next few chapters that could be any problem and introduce some tools and techniques that can be used to analyse the problem. Then I will introduce further creative tools and techniques to help generate ideas that solve or help overcome the problem.

I will introduce some more tools and techniques in later chapters of the book.

I'm keeping it simple in this first example – remember, this book is a guide to individual problem-solving techniques. Not group based techniques – that will be the subject of another book. Remember that you can, if you want at various times, ask others for their opinion on the situation, what they think of the issues you have raised, what they think of your understanding of the situation. You though, are the one doing the problem solving.

The Problem Question: The question to be set for this generic problem-solving example is:

With Regards to the Situation Regarding YYY, What Are the Problems I Currently Face.

Notice the word problems, not issues. We are looking for the negative issues and factors. A different question such as "What are the issues/factors affecting our current situation" would mean that we want to look at negative AND positives issues/factors – more on this in Chapter YYYY

Issue Generation Techniques.

This is the Divergence phase where you list as many of the issues that you can think of that affect the problem areas. You have identified a problem area, now write it down and keep it visible. Put it in large words where you can easily see it.

With Regards to the Situation Regarding YYY, What Are the Problems I Currently Face.

Now you need to start writing problem issues that you think relate to the problem, down on sticky Notes, and there are several techniques you can use to maximise the number of issues you think relate to the problem area.

Divergence Phase.

Brain Writing.

Basically, a brain dump of all that you think you know about the problem situation. Write down ALL the issues you can think of that relate to the problem. Write 1 issue per sticky Note, number them consecutively, and stick the sticky Note on the board. Issues raised should be in the form of a short sentence that is easy to read and no more than 5 or 6 words. If

you are using hexagon shaped tools, write the issue with a point of the hexagon upwards, and another downwards, not sideways. Writing with the points vertically means that it is easy to cluster the issue (LATER, NOT NOW), but writing with points horizontal leads to the forming of lists and not clusters.

Do not use the words “and”, “or”, “because” in your written issues. Using the word “and” means you have written 2 issues and not 1. Using the word “or” means that not only have you written 2 issues, but you are also stating that you must make a choice between them. Using the word “because” means that not only have you written 2 issues and not 1, but you have also assigned a cause and effect.

Be specific about meaning. Although this book is aimed at being of use for the individual, groups might be involved. “We” cannot do X. Who is “We”? Is it my family, my team, the division, the membership, I (meaning myself)?

Don’t say “We don’t communicate well” say “The committee doesn’t communicate well”.

Number every issue you write and place randomly on the board – DON’T LOOK FOR ANY LINKAGE OR SIMILARITY. Each issue on the board can be seen as the hook on which you hang the meaning. If you are asked to explain what you mean by what you have written, then you could spend a minute or so using far more words than you wrote down to give a full explanation of what you meant. Don’t change the meaning.

You will run out of steam eventually and run out of issues to write. Because you are raising issues that you know about, there is very little scope for creativity in this phase. You are simply raising the issues that you see as the problems you face. There is though, a couple of more creative techniques that can help you look at the problem issues in a different way, raise some more issues that you hadn’t thought about. One is “**Focused Concentration**”, and the other is a “**Rich Picture**”. Although the Rich Picture method should really be in Chapter 6 – Problem Identification – Issue Analysis, I have described it here, as the technique can be used to raise problem issues that have been missed.

Focused Concentration. A technique I have named. It involves focusing your concentration at certain areas of the problem situation and coming up with problem issues related specifically to that area. By concentrating on issues related to specific areas, you could raise issues that you overlooked in the first part of this brain writing phase. Maybe take the area of money and concentrate on this subject only to raise more problem issues, then move to marketing, etc.

Rich Picture. A rich picture is a method of exploring, acknowledging and defining a complex or badly defined situation and presenting it as a sketch, or drawing, to create a visual picture of the

situation. It helps show the issues, how they affect each other and makes it easier to describe the situation.

Sketch out a drawing that shows issues affecting the problem and use that to generate additional issues related to the problem. What you could also do is develop a Rich Picture that shows the situation as you would like to be.

For further information, and to see examples of Rich Pictures go to:----

www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

Convergence Phase.

You now move to the Convergence phase where look at all the issues we have raised and look at them in some depth, both individually and collectively. You have raised numerous issues and now you need to home in on the correct and real issues and you start by using THE FOG INDEX.

The Fog Index.

FOG index stands for FACT, OPINION and GUESS. Garbage in means Garbage out, so you need to work with FACTS and FACTS alone.

A FACT is incontrovertible and can be proven in a court, or scientifically – Newton's Laws of Motion are FACTS they have been proven scientifically. FACTS can be proven qualitatively and quantitively. Qualitatively by interviewing witnesses or reading reports, quantitively by numerical analysis.

An OPINION is a considered thought, it might be a fact but hasn't been proved. It might be easily proved, but until then it is an OPINION. Einstein's Theory of Relativity is an OPINION, although it appears to hold good in certain areas, it has never been proven (and probably never will – just my opinion). You can research OPINIONS and decide they are FACTS, and similarly an OPINION might have no basis in FACT at all. It could be worthwhile though discovering why the OPINION holder has that opinion.

Someone who holds a strong opinion on something will see it as a FACT - it isn't a FACT. No matter how senior the OPINION holder, or how strongly the OPINION holder holds that OPINION, an OPINION is not a FACT until proven otherwise.

A GUESS is an uncertain thought or idea and although they should be ignored during certain parts of the creative solving process (Divergent phases), GUESSES have their uses though. It's not unknown for a GUESS to turn out to be a FACT. The guesser might, through luck, have made the right connection and their GUESS turns out to be a fact.

Where GUESSES are important is in the Divergence part of the Alternatives Development stage of the creative problem-solving process. Being creative is about using your imagination to come

up with ideas – ANY ideas. It doesn't matter how strange, childish, impossible those ideas are, you need to generate as many ideas as you can. The more ideas you generate or GUESS, the more chances you have of getting the ones that help you resolve the problem area.

Look at the issues you have written on your sticky Notes and stuck on your board. Get 2 more pads of sticky notes in in 2 different colours. Look at each of the issues you have put on your board and decide if it is a FACT, OPINION or a GUESS – remember the definitions of FACTS, OPINIONS, and GUESSES. If it is a FACT, then leave it on its current sticky Note. If it is an OPINION, transfer the wording to, say, a blue sticky Note and bin the original relevant sticky Note. Anything you know as a GUESS should go on another coloured, maybe green, sticky Note. You now have your issues divided into FACTS, OPINIONS and GUESSES and I expect that your biggest group is OPINIONS.

If you don't have different coloured sticky Notes then put an "F" in the corner of a FACT, an "O" in the corner of an OPINION and a "G" in the corner of a GUESS.

You now need to research your OPINIONS and see if they are FACTS. Those that turn out to be FACTS should be written back onto the FACT coloured sticky notes, and those that are not, can either be left as OPINIONS, or transferred to the GUESSES coloured sticky notes.

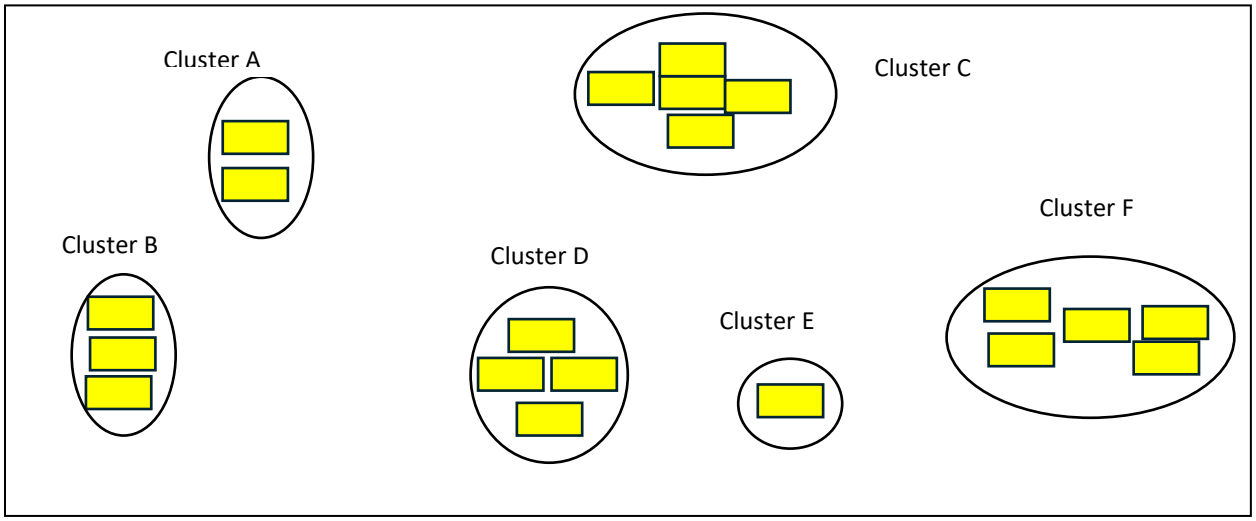
You have reduced the number of issues by applying the FOG index - a process of Convergence. You can now converge further by clustering or grouping issues together

Clustering. When you cluster issues, you are looking for a connection or association between them, you are not categorising them, and don't try to name the cluster. Don't try to force a connection or an association, if there is a connection then it will become apparent. Don't say "issue 10 and issue 15 are marketing issues, I will put them together and call this cluster Marketing" – this is categorising, not clustering. They might be marketing issues, but there could be either no link, or a very weak link, between them. Those issues might be more strongly connected with other issues.

Pick up a sticky note with an issue on it, put it next to another issue and ask yourself "Does this issue belong with this issue?". If it does put the 2 issues next to each other to form your first cluster, if it doesn't belong then find another issue it does belong with. Pick up another issue and do the same thing. Continue with this exercise until you have associated all the issues. You can change your mind and move issues between clusters.

By the end of this phase, you will have on your board several clusters that vary in size from maybe 10 issues, down to 2 or 1 issues.

Now name the clusters. Look at the issues that make up the clusters and see what name you can give them.



Take the names of your clusters, and put the cluster name on separate sticky notes

Hexagon Shapes. This is where the Hexagon shapes, I mentioned earlier can be so useful. If you could write your issues on to hexagon shaped sticky notes, magnets etc. then the clustering phase becomes much easier as the hexagons cluster easily, and you can arrange the issues in such a way as to tell a story. In fact, the use of Hexagons shapes deserves further explanation as there has been a significant amount of research carried out into how using Hexagon shaped tools can help with creative problem solving.

For further information, and case studies, on Hexagon Thinking----

www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

Chapter 6 Problem Identification – Issue Analysis

By this stage you have arranged your issues into clusters, and now you must look at the way those clusters, and issue relate to each other. These techniques are aimed at helping you understand more, the dynamics of your problem area.

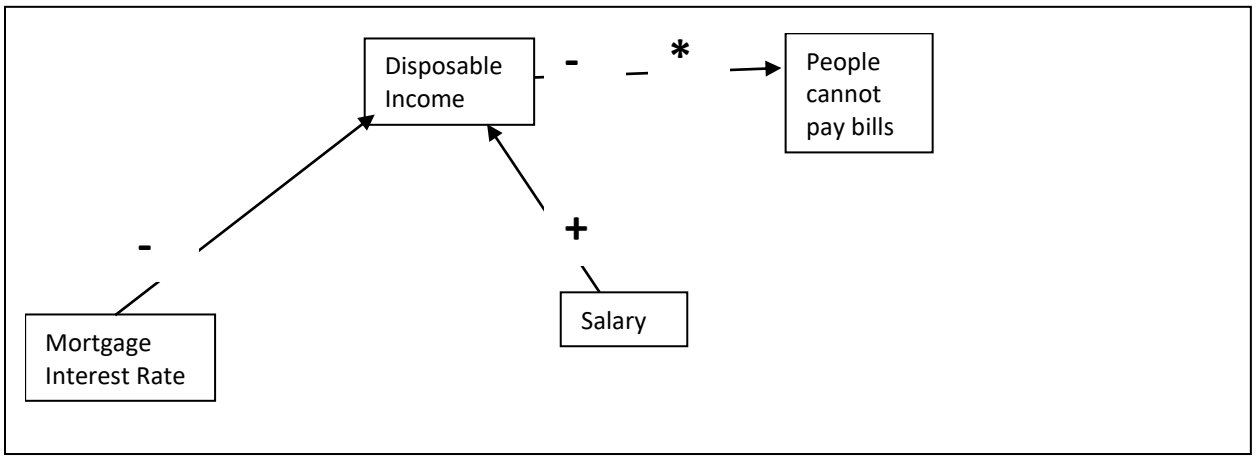
Modelling

Signed Digraphs.

Take your sticky notes which represent the clusters, put them on the board and draw arrowed lines between them to show which cluster affects each other cluster. The tail of the arrow should start at the cluster that is influencing another cluster, and the point of the arrow should be on the cluster which is being affected. So, if the tail of the arrow is on "Cluster B, and the head of the arrow is on Cluster D, we say that Cluster B has an influence on Cluster D

You can add icons to the arrows to help us with our cause-and-effect analysis. Put on the arrow either a positive sign "+" sign or a negative sign "-" depending on the direction of the effect. If changes in the "cause" cluster (beginning of arrow) produces a change in the same direction on the "effect "cluster (head of the arrow) then use a "+" sign. If a change in the "cause" cluster produce a change in the opposite direction on the "effect" cluster use a "-" sign. In the example below: A rise in the mortgage interest rate usually reduces personal disposable income, whereas a fall in the mortgage interest rate increases personal disposable income. – therefore we use a "-" as cause and effect are in the opposite direction. As salary, increases, disposable income increases (theoretically), if salary decreases, then disposable income decreases – therefore we use a "+" sign as cause and effect is in the same direction.

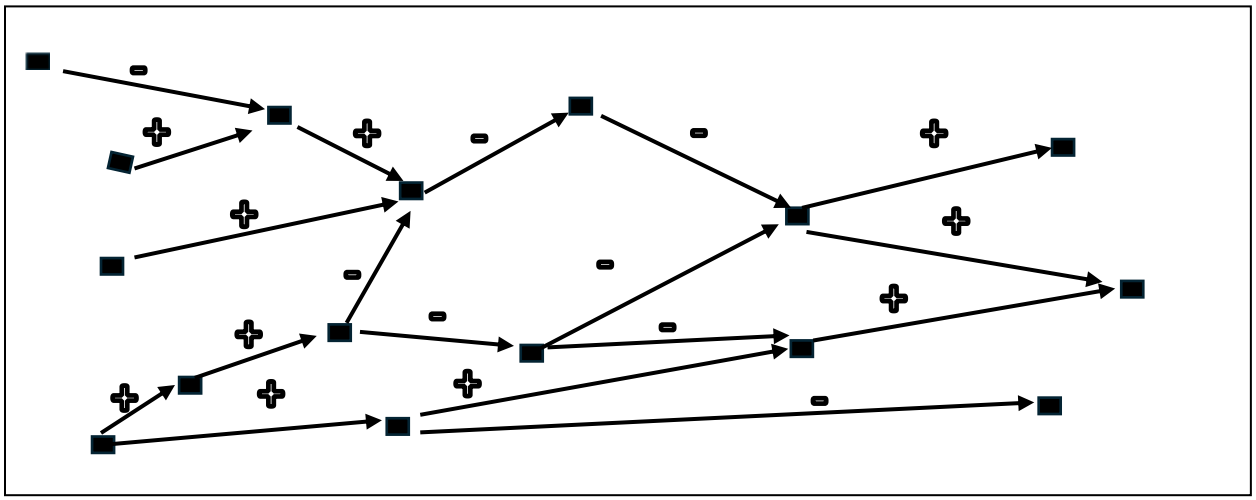
You could add other signs to signify different properties. Maybe a double "-" or "+" could mean



that a small cause has a large effect Maybe an "*" signifies a time lag between cause and effect – an increase in food costs might not lead immediately to an increase in menu prices in a restaurant. Carry out this exercise with the cluster names. You can also carry out this exercise

using the individual issues that make up individual clusters to gain an understanding of the dynamics of the problem area. As you develop the digraph further, you will see that the issues at the heads of the arrows tend to be affected more by the events at the tail of the arrows. Move your Notes and arrows around so that the causes are more to the left of the board, and the effects to the right.

Eventually you should end with the issues that have no arrows entering them at the left of your board, and the issues that have no arrows leaving them at the right of your board – you can call this the SIGNED DIGRAPH MAP. Looking at the map example below, the problem issues are those to the left of the digraph, and the symptoms to the right. Recall that each arrow in the signed digraph has an indicator or such as the "+" sign or "-" sign that indicates if a change in the issue at the tail of the arrow has an effect in the same direction, or opposite direction on the issue at the head of the arrow.



By the end of this stage, you should have raised most of the issues that you think are related to the problem area. You have looked at those issues in several different ways, that should give you a deeper insight into the problem area, and help you understand the problem area better. You could have analysed both the effects the clusters have on each other, and the effects the individual issues that make up clusters have on each other.

Now to use a different technique – SWAP SORT to look at the problem in a different way. Before you do that though, you need to keep a record of the map, either by photographing it, or even better leaving it in place and duplicating the cluster names and individual issues.

Interpretive Structural Modelling. Interpretive Structural Modelling, or ISM for short is a method where you take 2 issues and ask if there is a simple yes/no relationship between them. These are known as PAIRED COMPARISONS. When considering problem areas then the question could be "In the context of understanding our problem, does Issue AAA **substantially aggravate**

Issue BBB?". The answer is either a YES or a NO, but you must understand that the important word is "SUBSTANTIALLY". Issue AAA might aggravate Issue BBB, but AAA might not SUBSTANTIALLY aggravate BBB; there might be other issues affecting BBB as well, or that changes in AAA simply don't have much of an effect on BBB.

The importance is in the context. If you are trying to analyse a problem area, the question should be "In the context of understanding our problem, does Issue AAAA substantially aggravate Issue BBB?". If looking at a situation where you are considering positive and negative issues, the question could be: Does Issue AAA substantially ameliorate Issue BBB?

Large numbers of issues means that many numbers of paired comparisons must be considered. If you have 20 issues, then the maximum number of paired comparisons is 20 x 19 = 380 paired comparisons. BUT we can assume that if AAA has a significant effect upon BBB, and BBB has a significant effect on CCC, and CCC has a significant effect upon DDD, then we don't need to ask if AAA has a significant effect upon CCC or DDD as we can infer that AAA does. There are software programmes available that will carry out this inferring for you, thus reducing dramatically the time required for the process.

Interpretive Structural Modelling is part of a generic complete problem-solving methodology that can be used in many areas such as legal case preparation, new product design, academic course syllabus design, and many more.

For further information on Interpretive Structural Modelling and case studies----

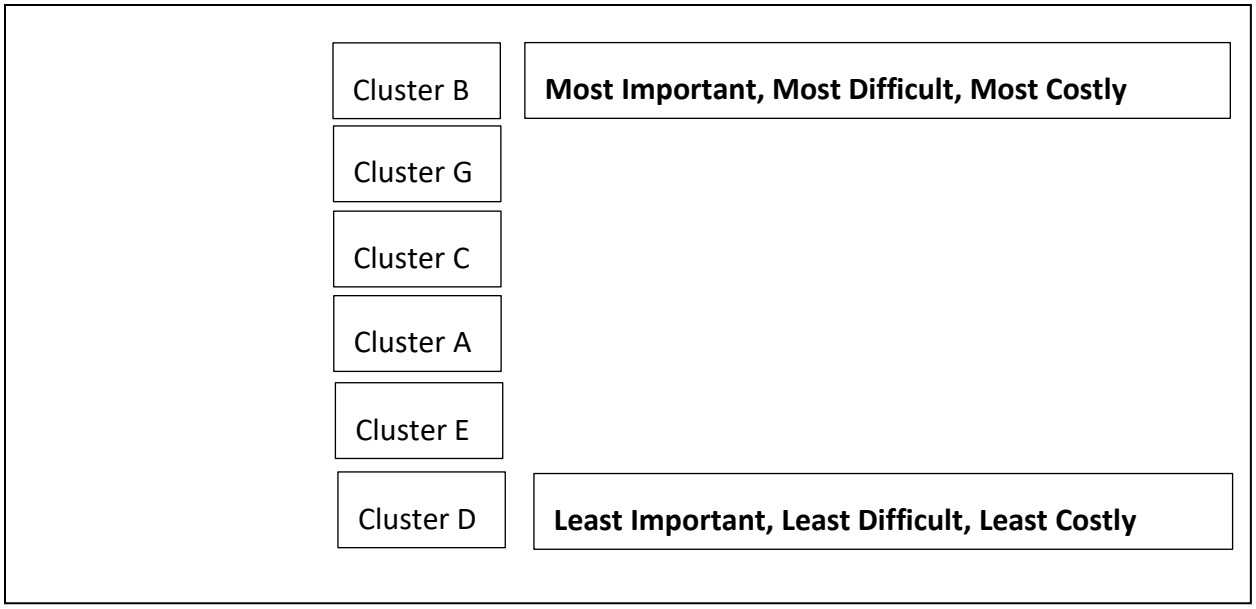
www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

Categorising

Swap Sort. Place your cluster names around your board and imagine your cluster names arranged vertically in a column by a chosen criterion. You could have multiple criteria: Importance, easiest to resolve, cheapest to resolve, greater impact, more complex etc. If you decide that your criterion will be "more important than". Pick the cluster name that you think most important and put it at the top of the column. Then pick the cluster name you think the least important and put that at the bottom of the column.

From the remaining names, pick the cluster name you think the most important, and put that underneath the one you originally considered your most important. Similarly, from the remainder, pick the cluster name you think the least important, and put that above the one you originally considered, your least important.

Work through the shrinking list of cluster names, choosing most important/least important, until



you have everything stacked in the column. Now look at your column and ask yourself if the order of importance is correct. If it is then great, if it isn't, move cluster names up the list until you are happy that the order is correct. Always move cluster names upwards to sort, never downwards, this way you are always saying "Is this more important/more difficult/more costly than that".

Don't forget to look at individual issues within each cluster as well and swap sort those

Now comes the difficult part – overcoming the problem area.

Chapter 7 Alternatives Development – Solutions Generation

Issue/Idea Generation Techniques.

Having now (hopefully) gained a greater understanding of the problem area, you need to generate some solutions to the problem area to help you resolve it. You now move back into the DIVERGENT mode where you generate as many potential solution ideas as you can. From these solution ideas you generate some alternative plans, and from these, develop the best plan.

The solutions generation process to produce new ideas is very similar to the problems generation process. You initially use the same basic idea generation techniques to raise ideas and put them on your wall. Then you use creative idea generation techniques to come up with new, and previously unthought of ideas.

I'm not repeating the instructions for Brain Writing and Rich Pictures, as these have been covered in Chapter 5.

When identifying the problem area, you were interested in the FACTS of the situation and not OPINIONS or GUESSES.

In the development of solutions, you need to be comfortable with generating ideas that are based around OPINIONS or GUESSES – sometimes called CREATIVITY and for this you will be using several creative problem-solving techniques to generate ideas.

Principles of Using Creative Problem-Solving Techniques

There are several recognised principles for a successful idea generation session.

Suspend Judgement.

When generating ideas suspend and defer all judgement. When ideas come just write them down and put them on the board, don't think for one moment that an idea is good or bad, just write it down and put it on your board.

Although this book is aimed at individuals trying to solve a problem, you can get others involved if you want. If you do, then double down on the suspension of judgement. "Oh, that's a good idea" leads people to think that they have suddenly developed a solution. "Oh, that's not a good idea" leads other to think that it isn't worth saying anything because they will be shot down as soon as they speak.

As Stalin Said "Quantity Breeds Quality".

. As that great democratic, open-minded and generous world leader Josef Stalin said, "Quantity has a quality of its own", though he meant it in a different context. The more ideas that you generate, the higher the probability of generating the good ideas that help resolve the problem area. Remember to SUSPEND JUDGEMENT. More ideas can be generated when judgement is deferred.

The Wilder the Ideas, the Better. Idea generation (the divergent process) requires risk taking to be successful. Breakthrough ideas are needed, and these ideas are unlikely to be generated if a risk-averse or cautious attitude is taken. The value of wild ideas lies in their ability to stimulate unique possible problem solutions. Einstein, for instance, developed his Theory of Relativity because he imagined himself riding on a sunbeam, and letting his imagination take him on a journey around the Universe where he imagined things he hadn't thought of before.

You are generating as many ideas as you can, you aren't implementing them (yet).

Combine and Improve Ideas. Generate new ideas by combining ideas together. The lion is poorly and needs life-saving surgery. We have 2 possibilities 1.) The vet goes in, sedates the lion and operates. 2.) Shoot the Lion to spare it a painful death. Daniel the vet thinks the 1st option is a little risky and politely declines the invitation, so the 2nd option is the only realistic solution. "Hang on" says someone, "Can't we shoot the syringe into the lion and sedate it that way"? Thus, was born the Dart or Tranquiliser Gun.

Take a Break from the Problem. Creative problem solving is a tiring process, don't work until you are tired. If you do, then the quality of thinking will fall off and tempers could be lost. With a group have a break every 20-30 minutes, as an individual 10 – 15 minutes.

Defining the Question.

Once again, you need to define the question, and for this example it will be kept simple. The original problem question was

With Regards to the Situation Regarding YYY, What Are the Problems the Situation Currently Faces.

Now that you have raised the problem issues and looked at them in several different ways to (hopefully) get a better understanding of the problem, it is a fair point to say that a simple question to generate possible solutions could be:

With Regards to the Situation Regarding YYY, What Are the Possible Solutions?

Go Forward To The Past. So, we now do another Brain Writing exercise where you think of any possible action or issue you could carry out that could overcome the problem.

Go back to the process you carried out in Chapter 5 – the Brain Writing exercise. The same rules apply and keep writing until you run out of steam. When you have finished, you will probably notice that most of the possible actions you have written down are things that you either know you can do or are quite sure you can do. Number the possible solutions as you write them.

Divergence Phase.

Now you need to start getting creative and think of the things you never thought of. But firstly, let's look at the PAPERCLIPS exercise. The paperclips exercise is an exercise that a facilitator or trainer sometimes uses as a warm-up exercise and to get people thinking creatively.

A Creativity Exercise - Paperclips.

The human brain works best when it is in negative mode. Put an idea to people and they will immediately come up with all the reasons why it won't work, and all the obstacles you will face when putting the idea into practice. This can be shown with a very simple demonstration/warm up exercise where participants are asked by a facilitator or moderator to write down all the things they can do with paper clips. Participants write furiously for about 20 seconds, then they stop. They will have written about 5 things they can do with paper clips. Hold paper, clean out your ears with them, pop a pimple, scrape a hole in a black fingernail, use to put a cord back in a hoody, pop-out a stuck CD. They will think of the things they have used paperclips for.

The participants are then asked to write down all the things they think they cannot use paperclips for. After a few minutes of furious writing, they must be told to stop. Participants then read out their list of things they cannot do with paperclips, and the lists go on and on. The most common things that you don't appear to be able to do with paperclips is: Eat them, have sex with them, wear them, ride on them. The moderator then shows how you can do all these things with paperclips.

Paperclips hold paper, right? Hold paper between 2 biscuits – the biscuits become a form of paperclip you can eat, ask someone else to hold some paper for you and they become a human paperclip, and you can (only if they say yes) have sex with them. You can link a lot of paperclips together and make a chain mail type garment you can wear. Melt a lot down and make a bike out of them you can ride. You can do almost anything with paperclips, you must just apply a little imagination.

Participants are then asked again to write down all the things they think they can do with paperclips, and after a few minutes of furious writing they are told to stop. The thing is, that you can do so many things with paperclips.

So, you have written down all the things that you think you can do to overcome the problem situation. Now to move on to some creative problem-solving techniques for generating new ideas.

Creative Idea Generation Techniques

Your brain writing exercise should have produced many possible ideas to help solve the problem, but the ideas produced, have come from your current understanding – they are old knowledge,

or existing knowledge. You need to produce NEW ideas that you have never thought of, and creative idea generating techniques are what you use to produce new knowledge.

One book on creative problem-solving techniques (Techniques of Structured Problem Solving; Van Gundy) lists more than 60 creative idea generation techniques. The same book also describes 16 techniques for evaluating and selecting ideas and 4 ways of planning the implementation of ideas. The techniques mentioned below are some of the simpler techniques and are recommended for individual use.

Remember you need to suspend judgement, quantity breeds quality, the wilder the ideas the better, combine and improve ideas and take a break from the problem.

GUESSES and OPINIONS are positively welcomed in this phase – get those wild, wacky, improbable ideas out there.

Number all ideas as you produce them.

Assumption Reversal. Think paperclips. Write down a list of the things you assume you cannot do to resolve the problem area. Reverse those assumptions to say you can do them and come up with ideas to make it happen. Ignore the constraints that you think you have – "Senior management won't allow it" – how do you know? It doesn't matter if you come up with odd or silly ideas, you are generating ideas that might lead on to something else that might (in your OPINION) be more realistic.

Idea Association. Combine any 2 ideas you have on your board together and make a 3rd idea from them. Think syringe and gun to produce a dart gun to anesthetise wild animals. If you cannot think of anything for a 3rd idea, try and force yourself to generate a 3rd idea, even if it sounds stupid.

Role Storming. This involves looking at the problem from the point of view of another person. It could be a customer, a business partner, a person from history, or a fictional person. It could be anyone – Winston Churchill, Bart Simpson, George Washington, Robin Hood, Bilbo Baggins – your choice. Put yourself in their shoes and try and think what they would suggest.

Superheroes. A variation on Role Storming. Adopt the persona of a Superhero and see how he or she would use their superpowers to resolve the problem. What would Batman do? What would Superman do? Make it a Super Villain – What nefarious things would Lex Luther or The Joker do?

Rudyard Kipling. Also known as 5W and H. "I keep 6 honest serving-men, (they taught me all I knew); Their names are What and Why and When, and How and Where and Who". *The full poem is very funny and refers to the questions that little children keep asking.* Look at some ideas you

have put on your board and ask yourselves questions about them. Start the questions with one of the 6 honest serving men – How could it be done? Who would be involved? When could it be finished? You are generating more ideas.

Wishful Thinking. Exactly what it says. Put yourself into a perfect world where you could do what you wanted to do – everything is possible. When you have done that, think of ways you can make it happen. Don't though put yourself into a world that is so perfect that everything you do succeeds.

The aim of using creative techniques such as these is to generate ideas that can be used to help overcome the problem area. It doesn't matter if those ideas are, in your opinion, realistic or not. The aim is to generate as many ideas as possible.

Other Methods. If you need more ideas, then have a drink – a nice double Gin and Tonic might help those creative ideas, alcohol is an inhibition reducer. When I was at Henley Management College, I suggested a small research project that tried to find the optimum amount of alcohol, that would produce the most number, and most creative, of ideas. Unfortunately, it got turned down.

If you still need more ideas then get hold of a child, preferably related to you, and ask them for their opinions, if they are anything like my children used to be (and still are) they will give you an honest opinion that will make you wish you never asked.

Having exhausted yourself and your creativity by getting lots of ideas up on your board, take a break before you move to the CONVERGENCE part of this SOLUTIONS GENERATION phase.

Ignore the FOG index, you aren't interested in FACTS only here, you are interested in all the ideas that have surfaced to help overcome the problem.

Convergence Phase

It's now time to move back into a CONVERGENCE phase where you reduce the number of ideas to ones you think most realistic. In Chapter 5, the first convergent technique was the FOG index where you reduced the number of issues by describing them as FACTS, OPINIONS or GUESSES. You wanted FACTS, and you researched the OPINIONS and GUESSES to see if they were FACTS. If they weren't FACTS then the issues were discarded.

You can't use the FOG index at this stage because you have actively generated OPINIONS and GUESSES as potential solution ideas. You must use some new techniques into the process to see how realistic the ideas you have generated are. Some good techniques for this converging stage are "Creative Evaluation", "Highlighting" and "Reverse Brainstorming".

Creative Converging Techniques

Creative Evaluation. You have your list of ideas generated. Using Roman Numerals, categorise each idea in one of 3 ways: I (simple), II (hard) and III (difficult). The simple ideas are those which can be implemented with minimum spending of time and money, the hard ideas are those that require a greater spending of time and money, and the difficult ideas are those that require greatest spending of time and money. This technique is another form of clustering. This technique grades against simple criteria. You could use other criteria such as technically easy, technically more challenging, and technical difficult.

Use a few different criteria to evaluate the ideas.

Highlighting. This is an efficient idea and evaluation technique. 1) You should have numbered your ideas consecutively, as you wrote them. Mark those that look intriguing or interesting – these are your "hits". Don't think about their workability. 2) look at all the hits and identify those that seem to be related to each other in some way. Clusters of hits are called "hotspots". List the hits identified for each hotspot 3) Investigate each hotspot and what it represents – the meanings, implications and possible consequences. 4) Select the best hotspot to satisfy your needs for the problem. Maybe combine 2 or more hotspots to produce a "final" possible solution to the problem.

Hits and hotspots don't need to be identified, maybe a hit will jump out right away, maybe there won't be any hotspots, just a few hits.

Reverse Brainstorming. Sometimes known as negative creativity, or the tear-down method. Look at the 1st idea and write down a list of what could go wrong with it. When you have written down all the criticisms you can think of, go to the next idea and write down all the criticisms you can thinks of. Carry on until all ideas have been fully criticised.

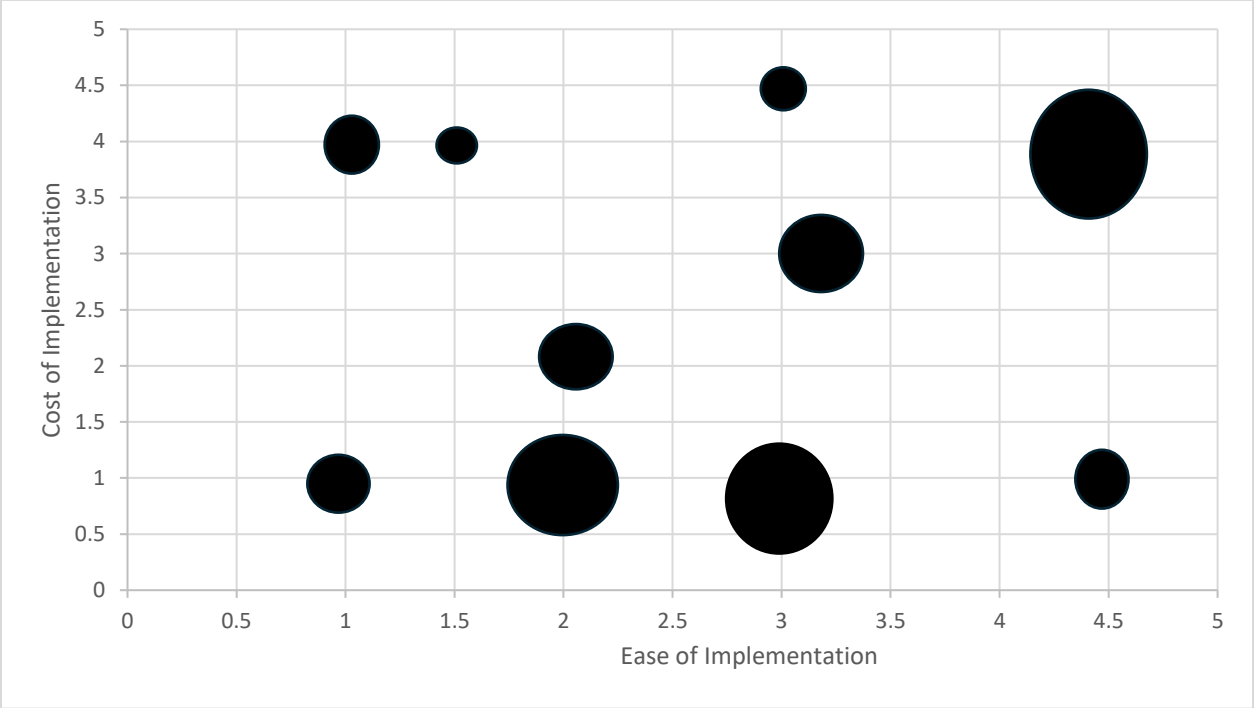
Carry out another Brain-Writing exercise on the original ideas (not the criticisms), to produce solutions to the criticisms raised. The idea(s) that possess the lowest numbers of criticisms, and most likely to resolve the problem can then be taken forward.

Some words of warning. You really need no more than 10 ideas to criticise, or this process could take rather a long time to carry out, also, as the number of ideas criticised rises it adds complexity to the process. This method then is best used towards the end of the converging process.

Although Reverse Brainstorming gives an emphasis on the negative, it is important that good ideas are not rejected simply because you have identified weaknesses in the idea. Certain ideas might have a high number of criticisms against them, but those high number of criticisms could be easy to overcome. Other ideas might have very few criticisms, but those few criticisms, could be very difficult to overcome.

Don't let the negative feelings generated by this technique, overcome the positive feelings you have for an idea. Too many people don't consider what could go wrong as it might appear negative. Negativity does have its place at certain times, as ignoring what can go wrong with implementation means that you don't have a Plan B.

X-Y Chart. An X-Y chart is a chart that shows the position of individual issues on a 2-dimensional chart. You consider the criteria that you want to consider your ideas or plan against. You might say that you want to consider them against "Ease of Implementation" against the X-Axis, and "Cost of Implementation" against the Y axis. You set your scale for the axes, with a scale usually being between 1 – 5 or higher. You might think that Idea 1 has a low Cost of implementation, and a low Ease of Implementation, so you put it in the lower left-hand quadrant. Issue 2 might have



a high Cost of Implementation, but a low Ease of Implementation, so that goes in the upper left-hand quadrant. Continue this exercise with all the criteria, or ideas that you have.

Your criteria will be whatever you think important. Examples of other criteria could be "Expected Resistance of Management", "Return on Cost over 12 months", "Time Frame to Implementation".

The chart could be an X-Y-Z chart on 3 axes where the 3rd Axis could be signified by different sized Notes (in the above example, different sized circles). When put on the X-Y chart, the larger notes could signify a higher value that comes out of the chart towards you. Different coloured sticky Notes could signify a 4th dimension, with low numbers being blue and high number being red.

In Risk Management exercises the idea being measured would be the risks being faced. The X axis could relate to PROBABILITY of the risk occurring, and the Y axis would be the IMPACT if it occurs. The Z axis could be how well the risk is CONTROLLED now.

You will find that Microsoft Excel™ and Microsoft PowerPoint™ have features that will produce graphs in these formats.

Clustering. It's back to clustering again as described in Chapter 5, where you look to sort the ideas into clusters based on perceived connections or associations. As before, name the clusters, then apply the techniques, to the cluster names. You can also apply the techniques to the ideas within the clusters.

Idea Analysis Techniques. Then apply the same techniques as described in Chapter 6 – Signed Digraphs and Swap Sort as you need to bring some order to the ideas you have generated. Cluster by using the same process as before to bring ideas together. You can then apply the analysis techniques described to see how the activities in various clusters can support and enhance each other.

With the Signed Digraph technique, you are looking to see a form of cause-and-effect structure that helps other ideas.

With the Swap Sort technique, you sort several times by using different prioritisation criteria such as, political acceptability, financial cost implication, ease of implementation, need to involve other people

You have generated the ideas, analysed them and formed categories of ideas. Now you need to generate some alternative plans.

Chapter 8 Alternatives Selection – Plan Development

By this stage you will have analysed your problem area, developed ideas to overcome the problem area, and reduced them to a reasonable number of ideas that can help you plan the solving of the problem. Now you must come up with a plan, or alternative plans.

Much like in Chapter 6, you have taken your ideas and applied various techniques to them to rate the ideas, group the ideas and see how the ideas affect each other. Now you must use the ideas to generate alternative plans. Ideally you will produce 3 or 4 separate plans that you can rate against criteria that can be weighted, with some criteria having a different weighting (or level of importance) than others

Prioritising.

Prioritising Your Possible Ideas.

You should have your ideas in clusters at this stage, with each cluster made up of individual ideas. Look at the possible actions in each cluster and prioritise those possible actions as described in Chapter 6. Those ideas could be prioritised by whatever criteria you think important. It could be ease of implementation, speed of implementation (not the same as ease), cost of implementation, order of implementation.

Prioritising your Clusters.

Now prioritise your clusters of ideas as described in Chapter 6. Your priorities for clusters could be the same as those for prioritising the ideas as mentioned above.

Plan Development.

You have prioritised the clusters from which you will you take your ideas. Now you develop your plan by taking the ideas that you think, when implemented, will provide the best solution to the problem. Look at each cluster in turn and separate the ideas, then start taking your ideas, in order, from the clusters starting with the most important cluster first. You can take multiple ideas from a cluster or take none. Once you are happy with the ideas you have chosen to implement, you must plan the process of implementing them.

Multiple Plans.

It could be wise to develop 3 or 4 separate plans based on different criteria for success: Speed of implementation, lowest cost, fastest generation of revenue for instance. You could do this for several reasons. You might want to see if you can pull the best of each plan out and combine them to make an improved final plan. You might want to generate multiple plans that you can judge against weighted criteria, as in a Pugh Matrix.

Comparing and Evaluating Plans

Pugh Matrix. A Pugh Matrix is a criteria-based matrix that is used to compare and evaluate multiple plans against a set of criteria. Each criterion is given a weighting dependent on its perceived importance.

You have developed your plans and have decided to evaluate them against the following criteria which have been given and associated weighting of importance.

Before you start, see implementation of your final plan as a PROJECT. A project has a specific start and a specific finish. The criteria for a successful project are that it must be completed on time, within budget, and be fit for purpose. The most important of these criteria is on time, the 2nd most important criterion is fit for purpose, and cost comes at the end.

Criterion 1: Speed of Implementation. Given a weighting of 4 – time is of the essence, the faster the better

Criterion 2: Total Financial Cost. Given a weighting of = 2 – cost has the lowest ranking weighting as (within reason) other criteria are more important.

Criterion 3: Fastest Generation of Revenue. Given a weighting of = 3 – quite important as the faster the revenue starts coming in, the better.

You then consider each plan on its performance against the criteria on a scale of say 1 – 5, where 1 means very poor and 5 means very good.

Looking below, Plan 1 ranks poorly on speed – it will be the slowest to get up and running, it will be the lowest cost though. It will also be quite slow in bringing in the money.

	Speed Criteria = 4	Cost Criteria = 2	Revenue Criteria =3	TOTAL
Plan 1	2 x 4	5 x 2	2 x 3	**24**
Plan 2	3 x 4	1 x2	2 x3	**20**
Plan 3	4 x 4	1 x 2	4 x 3	**30**

When looking at the total ranking, it appears that despite performing poorly with regards to cost – i.e. the most expensive, plan 3 is the preferred because it has the highest points overall.

For further information, and case studies, on the Pugh Matrix----

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Chapter 9 Plan Implementation –

Bearing in mind that this book is aimed at the individual problem solver, and not a problem-solving group, then plan implementation should be a relatively straight-forward process.

Implementation Techniques

You need to plan the work and work the plan – in other words you need to sort out what needs doing and get on with it. The best plan in the world will come to nothing if you don't do anything about it.

Now, you need to take the plan you have decided to be the best and turn the ideas in that plan into TASKS that need to be carried out to fulfil the plan.

A task might be an idea by itself, but it is likely that you will need to carry out several tasks to turn an idea into reality.

Getting On With It.

You the individual, have been working on a problem area that involves you alone. It could be a true personal area that involves you improving your personal situation, or you could be a small businessman/woman looking to improve your business situation. Either way, you just need to sort out the order you need to do the tasks required and get on with them.

You might need the help of others to implement the plan. At the personal level you could need the help of family or friends in some way. At the small business level, you might need to involve both suppliers, customers and associates to ask for help with implementation. n.

Critical Path Analysis

Simple plans just need sketching out on a sheet of paper and implementing. More complex plans probably need a more rigorous process, and the CPA (Critical Path Analysis) technique is an implementation technique that helps you plan out the tasks you need to take. Sometimes, in Critical Path Analysis, the word ACTIVITY is used instead of task. Both "activity" and "task" mean the "work to be done".

I'm only going to cover the basics of CPA here, there is a link at the end of the chapter to some useful web sites.

With CPA, each task has a duration, and you arrange your tasks in the logical sequence in which they need to be carried out. Your first task starts at time "0" and has a certain duration. You might have several tasks that could start at time "0" and have different durations.

Some tasks can only be started when a previous task has finished. It might be possible to start other tasks, a short while after a previous task has started (no need to wait until the event of the previous task).

Once all the tasks have been laid out in order, a mathematical addition forward pass through is carried out, consisting of adding task durations to the previous task "end" time and ending with the last task. There is then a mathematical subtraction backward pass starting at the end of the project and subtracting task durations from previous tasks "start" time. These pass throughs can be carried out manually when there are a few activities, they are just addition and subtraction process.

A project management type software is preferred though, especially for more complex and numerous activities. Project management software also allows you to add costs and resource requirements to activities.

At the end of the pass throughs, each task will have an Earliest Start, and an Earliest Finish. Each task will also have a Latest Start and a Latest Finish. The differences between the respective figures will give you the amount of float (flexibility, or tolerance), you have regarding starts and finishes of the tasks (wiggle room as we say in the UK).

Where the Earliest Start, and Earliest Finish are the same, and the Latest Start and Latest Finish are the same then there is no flexibility, or tolerance, regarding the start and finish of the task. These tasks are called Critical Tasks and MUST be completed on time for the project to be completed on time – A line of Critical Tasks form the Critical Path, and the Critical Path forms a continuous line of tasks from the start to the end of the project.

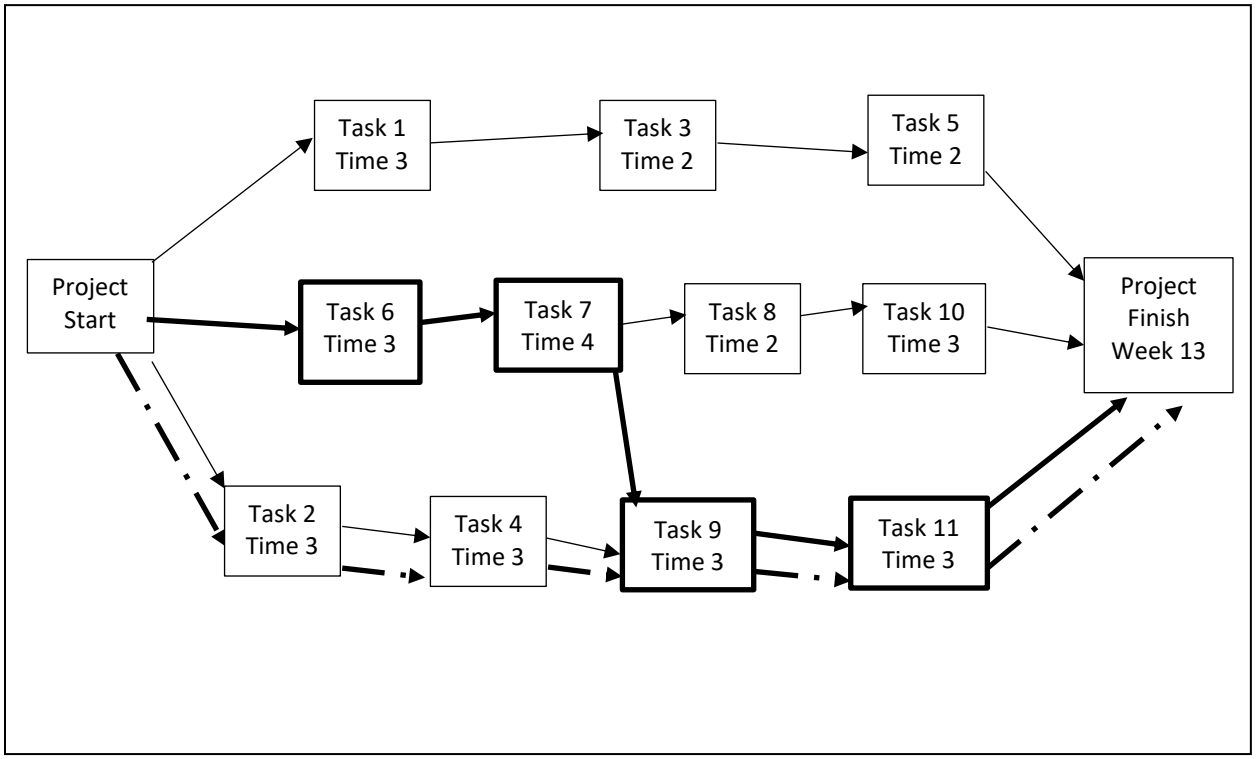
If Critical Tasks take longer to complete, the project end time will move back, and the project will finish late. If Critical Tasks are completed in less time than expected, the Critical Path will shorten, the project end time will move forward, and the project will finish early. If Critical Tasks take less time though, the original Critical Path might no longer be Critical, and a new Critical Path is formed.

If we look at the example below, the top line of tasks will take 7 weeks, the middle line 12 weeks and the bottom line 12 weeks as well.

BUT Task 9 cannot start until after Task 7 is completed at 7 weeks. This means that although Task 2 and Task 4 can take a week longer in total (they have 7 weeks in which to complete 6 weeks of work), this pushes the finish date out to 13 weeks, and the critical path is shown as solid heavily arrowed line.

If Task 3 was completed in 2 weeks and Task 4 was completed in 2 weeks, that means that the middle line will take 10 weeks to complete, and the bottom line 12 weeks. The project end date

is brought forward a week, and the Critical Path will then move as shown by the broken arrowed line.



You have developed your plan based on certain assumptions regarding the future. What if those assumptions are wrong though. What happens if something unforeseen (the unknown unknowns mentioned in Chapter 4) happens?

Stress Testing

Let us start with quotes related to stress testing:

Helmut von Moltke, a 19th Century German General said, “No plan survives contact with the enemy”.

Dwight D Eisenhower – American General and later President said “Plans are nothing, planning is everything.

Mike Tyson – Renowned boxer and strategist said “Everyone has a strategy until they are punched in the face.

Edward Murphy – Aeronautical engineer and developer of “Murphy’s Law” said, “Anything that can go wrong, will go wrong”.

Sods Law – Unattributed. There is an argument about the meaning of “Sod’s Law”. Some say that Sods Law is Murphy’s Law with the words “at the worst possible time with the worst possible

outcome" added to the end. Others say that whereas Murphy's Law is a general law, Sod's Law is more specific: "All traffic lights will be red when you are in a hurry", "you can never find a pen and paper when you want to take down an important phone number".

Now you must implement your plan.

What are you going to do if something goes wrong with your plan? As Mike Tyson said. "Everyone has a strategy until they get punched in the face". Sometimes the things that can go wrong are staring you in the face, but you don't want to notice them. Sometimes it can be something totally unexpected (the Unknown Unknowns) - curtesy of Mark Twain.

What if you are running a small business, and a major customer leaves you for some reason. Maybe the customer ceases trading, runs into financial problems, does it themselves, can't pay, or maybe even dies.

If you are dealing with a personal matter, then what happens to your plans if you have a major family illness or death, what about an unplanned incident such as being made redundant? What contingency do you have in place as a Plan B?

There are several recognised Stress-Testing techniques that help you test your plan, and these include Scenario Planning, Business Stress Testing and Financial Stress Testing,

Scenario Planning. You have the world as it is – the current reality, and if your plan works then you will occupy the world that you have planned for – a better future. Scenario Planning forces you to see how your plan works if the future world turns out to be very different to what you thought it would be.

You have developed your plan based on the current reality. Your plan requires you to do certain tasks at the correct time, have certain things available at the right time and in the right quantity. Nothing is certain in this world, and you will have had to make several assumptions, and each plan will have uncertainties about it.

Consider some of the major uncertainties in your plan – maybe 2 or 3. Magnify those uncertainties and assume that the worst situation occurs. How is your plan affected by those uncertainties now? Maybe a legislative or technical change means that the product or service your business provides is no longer needed. Maybe the career changes you planned and are working towards won't happen because the skills you are taking on are no longer needed. Think of something totally unexpected – pandemic anyone, surely not.

Business Stress Testing. Business Stress Testing is more concerned with issues that currently exist, you recognise, and you can have some control over. You just need to be aware of them.

Financial Stress Testing. Financial stress testing looks at how specific financial changes can affect you or your business. Many healthy businesses fail because others let them down financially, they can overtrade because they expand too fast and run out of cash. Interest rate changes can also have a major effect on heavily borrowed businesses

Individuals also need to know how changes in the financial environment can affect them as well.

Incidentally, the Microsoft Excel™ software has nearly 20 integral financial functions that help you calculate how changes in payments, interest rates and borrowing terms can affect loans, Internal Rates of Return, Net Present Value, Future Value and many more financial measurements. Google "Excel Financial Functions" to see the whole list.

For further information, and to see examples of Stress Testing techniques go to:----

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Chapter 10 – Other Analysis Tools

There are numerous creative problem-solving tools that you can use to help you with your problem solving. Here are a few simple ones that you can use, with some scenarios

SWOT Analysis

SWOT stands for STRENGTHS, WEAKNESSES, OPPORTUNITIES and THREATS. SWOT is usually used in the early stages of the decision-making process to evaluate the strategic placing of an organisation. It can be used to identify the same factors for an organisation or individual attempting to do something new. The organisation or individual who is attempting a new direction or objective, can use SWOT to identify the factors (both favourable and unfavourable) to achieving their objectives.

SWOT analysis is frequently used as a Divergence tool to generate factors and issues. It isn't a divergence tool, it is a CONVERGENCE tool. That is used to categorise issues raised.

STRENGTHS.. The internal factors (your attributes) that are helping you achieve your objectives.

WEAKNESSES.. The internal factors that are holding you back from achieving your objectives

OPPORTUNITIES.. The external factors (from the environment) that are helpful to you.

THREATS.. The external factors that are holding you back from achieving your objectives.

Brainwrite all factors that are affecting you, and they should be positive and negative factors. Then label the factors as either Strengths, Weaknesses, Opportunities, or Threats.

Using SWOT Outputs.

Businesses can look at the internal factors that are affecting the business performance. These are factors that the business has control over. The external factors are the factors that the business. What the business must do is adapt the internal factors to ensure they can cope with the external factors they have no control over.

Change the words business(es) to "individual(s)" in the above paragraph, and you will see how the SWOT analysis can help at the personal level.

For further information on the SWOT analysis and case studies----

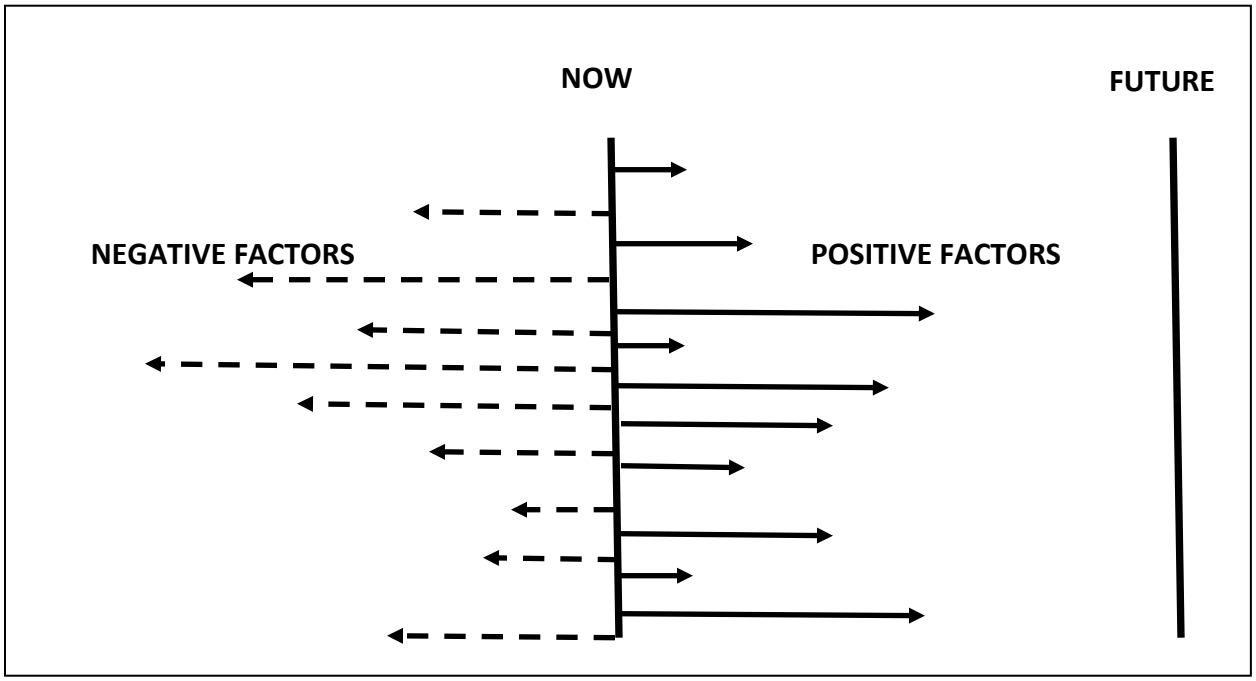
www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

Force-Field Analysis

Nothing to do with aliens or Flash Gordon, but a simple method that requires you to analyse the situation. Consider where you want to be- write it down in some detail, then consider where you

are now – write it down in some detail. Look at the things/issues/factors that you think are trying to take you where you want to be. Then, look at the things/issues/factors that you think are holding you back.

Draw a vertical line on your wall that signifies where you are now, and then a line to the right that signifies where you want to be. Using the vertical line that signifies where you are now as the start position. Draw arrows to the right for the factors that you think are taking you to where you want to be and label the arrows. Then draw arrows to the left for the factors that you think are holding you back and label the arrows. You can show the relative strength of each factor, by scaling the arrow length.



Now that you have drawn your Force Field, the important thing to do is work on reducing the effects of the negative factors, before you start work on increasing the effects of the positive factors. I like to think of the situation where you have an ocean-going boat, with a small fishing dinghy in tow. Both the boat and the dinghy are tied to the jetty, and the dinghy is also tied to the boat by the tow rope.

If you let go the rope connection between the boat and the jetty but forget about the rope connection between the dinghy and the jetty, everything is still connected to the jetty. As the force of the boat's engines propels the boat forward, the rope holding the dinghy (which is being towed by the boat) is keeping everything connected to the jetty. If you go to full power then you will either snap a rope, pull the dinghy apart, pull the jetty apart or pull the back off the boat. Why not just release the rope connecting the dinghy to the jetty?

Work on reducing the negative forces before you start working on increasing the positive forces.

For further information on the Force Field Analysis and case studies----

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Porter's Five Forces

Porter's Five Forces Industry Analysis is solely focused on the competitive market in which your business operates. It deals with the external elements – the opportunities and threats that your business faces. If you are a small business looking to introduce a new product into the market, then a Five Forces analysis could be of help to you. The Five Forces analysis helps you to determine the level of competitiveness in the industry area you are in, or want to enter, and this leads to an understanding of the profitability of that industry area.

The Porter 5 Forces Analysis can be used as a personal tool, especially when looking at your personal job prospects. If you see a job offer that you really want, then you see others going for the same job as competitors. See the job as the "industry" and analyse it. One of my web links points to an article on this in LinkedIn.

The Five Forces are:

Threat of New Entrants.. How easy is it for an organisation to enter the industry? What barriers to entry are there? Barriers could include: Amount of financial investment required, economies of scale required, capital costs required, level of expertise needed, distribution network required, regulatory network.

Threat of Substitutes.. You are a train company, there are coach companies ,cars and small plane air taxis.

Bargaining Power of Customers.. Threatening to move to an alternative product I a power that customers have.

Bargaining Power of Suppliers.. The suppliers to you have power as well; they could be the only supplier for some of your materials or components and effectively set their own price

Competitive Rivalry.. There is always competition in an industry, but how does that competitive rivalry affect you. Is your niche so small that the big guys simply don't bother about you and are you the first into that niche. This was the situation for the UK store "The Body Shop". They were the first ethically and environmentally cosmetic manufacturer for years.

Firstly, you have to determine the industry area you are interested in, and you need to be very specific. Let's assume that you are importing a fine speciality coffee (Civet Coffee anyone?) to sell through an exclusive distribution network. What industry are you in?

Although you are in the beverage industry, you can't say you are in the coffee industry because that puts you in competition with the likes of Nescafe and Kenco, as well as supermarket own brands. You could be said to be in the speciality coffee industry, but there are many speciality coffees now available and some of them won't be competitors to you as their target market will be different to yours as will your distribution network.

For further information on the Porter's Five Forces analysis and case studies----

www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

Chapter 11 - And Finally…

This book set out to introduce you – THE INDIVIDUAL - to some of the problem-solving tools and techniques taught at the various Management Colleges and Universities. To help you look at complex problems in different ways, and resolve those problems.

Obviously once this book is printed, it can only be updated with a 2nd Edition, but in the meantime keeping an eye on my website and page

www.russellcollinsart.com/a-little-book-of-individual-problem-solving/

will keep you updated on anything "new" that could be of help to you.

A Little Book of Group Problem-Solving Techniques

Although these techniques are aimed at the individual using them, they can be used with groups, and I intend developing this book further and produce A Little Book of Group Problem-Solving Techniques..

I will add a bit more here later.