# Turn your Thinking Around: New Approaches to Problem Solving

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ideas into action

# Part 1: Creative Thinking
# Lesson 1: The Copernican Revolution

# Problem-Solving

- **Problem Solving and Decision Making Creatively -** a five stage approach to problem solving with the most-used problem solving tools

- **Creative Accountant: Personal and Professional Problem-Solving Skills -** the three types of problem: the Critical problem; the Tame Problem; and the Wicked Problem.

- "**Turn your Thinking Around: New Approaches to Problem Solving**" - new problem-solving tools to help you think about problems in new ways.

# Turn your Thinking Around: Agenda

## Part 1: Creative Thinking

- Lesson 1: The Copernican Revolution
- Lesson 2: New Tools for Problem Solving

## Part 2: Problem Solving Tools for New Thinking

- Lesson 3: Tool 1: A Higher Level View
- Lesson 4: Tool 2: Combine Ideas
- Lesson 5: Tool 3: Word Association

## Part 3: Problem Solving Tools with New Resources

- Lesson 6: Tool 4: Intelligent Design
- Lesson 7: Tool 5: Driver Analysis and Tool 6: Solution Focus

## Part 4: Problem Solving Tools with New People

- Lesson 8: Tool 7 Perceptual Positions and Tool 8: Simplify the Solution

## Part 5: Problem Solving Tools using Counterintuition

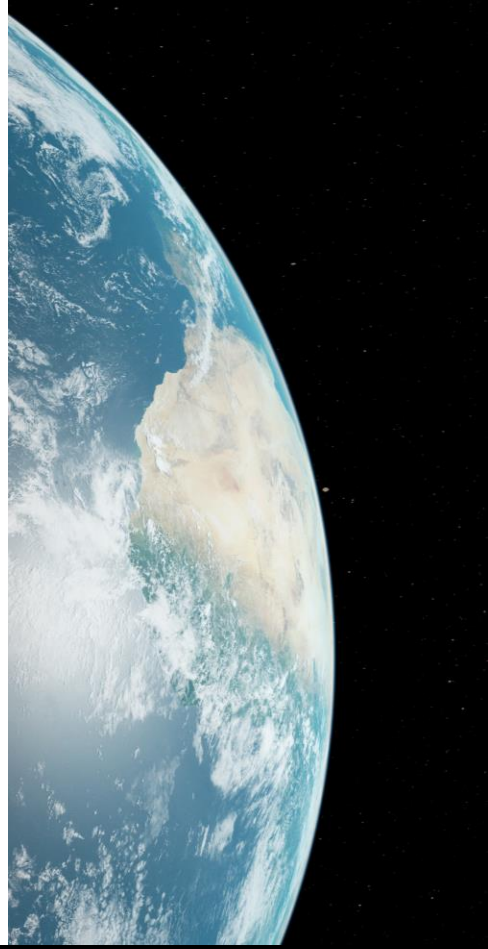
- Lesson 9: Tool 9: Bypass the Barrier
- Lesson 10: Tool 10: Contrary Mary and Tool 11: Impose Constraints

## Part 6: Using the Problem Solving Tools

- Lesson 11: The Problem Solving Team
- Lesson 12: What to use When

# The Copernican Revolution

1. Up until the sixteenth century, scholars, thinkers and leaders in the western world thought that the earth was the centre of the universe and that the sun and the planets orbited around the earth
2. The Roman philosopher Claudius Ptolemy believed that the earth was the centre of the universe
3. Some scholars, particularly in the Arab world, criticised Ptolemy's ideas. Nicolas Copernicus first published a work speculating that the earth and the planets might orbit the sun around 1514.
4. In 1596 Johannes Kepler published a book that supported Copernicus' theory. He showed that the planets moved in an elliptical orbit and developed the three laws of planetary motion



# The Copernican Revolution

5. With his telescope, Galileo proved that the earth and the other planets revolved around the sun.
6. Although Galileo argued that it was not contrary to the teaching of the bible, in 1616 the Roman Inquisition declared that the idea that the earth was not the centre of the universe was heretical.
7. Books promoting the Copernican view were banned, Galileo placed under house arrest for the rest of his life and died in 1642
8. The Protestant reformation in the 1500's freed many scholars from the dogma of the Catholic Church and the Copernican revolution continued with Isaac Newton and others.
9. Nowadays the term Copernican Revolution is applied to any paradigm shift in thinking.

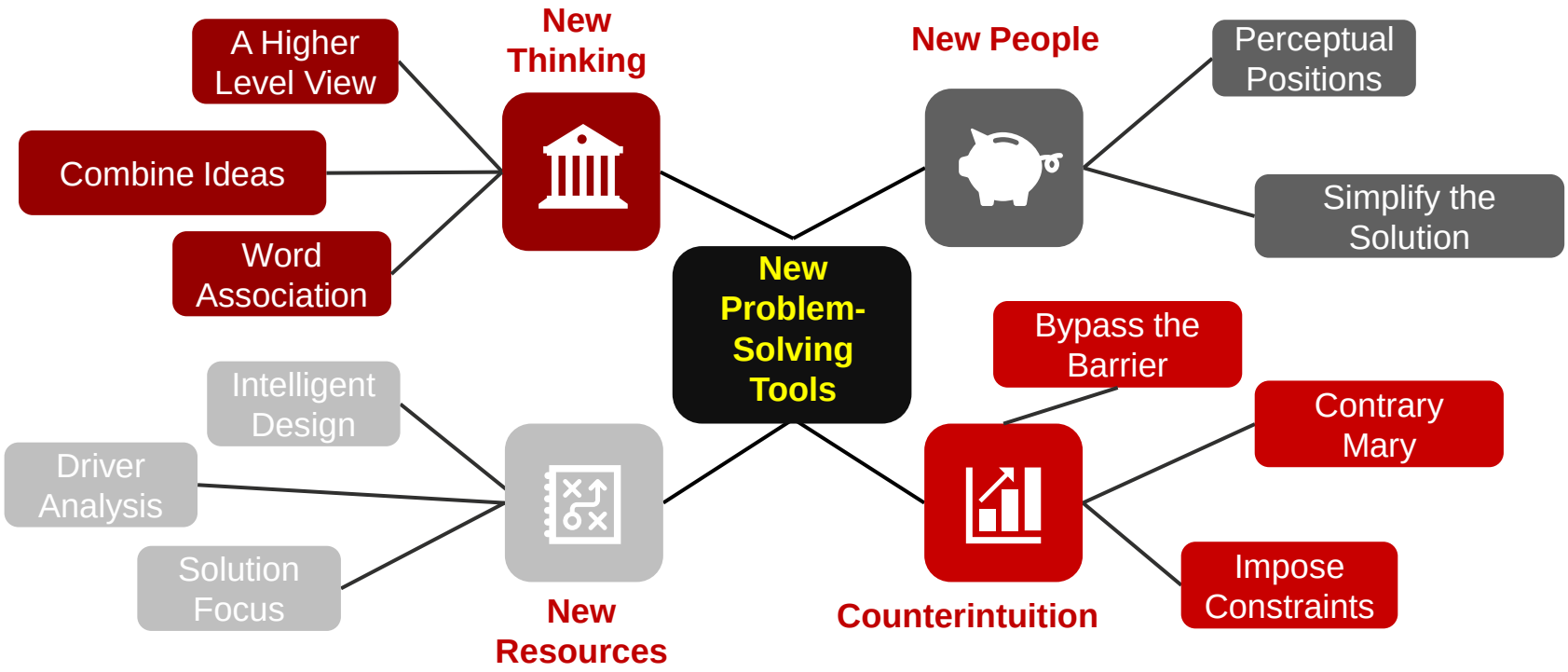
# Examples of the Copernican Revolution

- Steam Locomotion - “What can be more palpably absurd than the prospect held out of locomotives travelling twice as fast as stagecoaches?” - The Quarterly Review 1825
- Heavier than air powered flight
- The automatic firing gun
- The four minute mile
- Exceeding 150mph on water
- Putting a man on the moon

To develop bold new solutions to problems we need new ways of thinking about them

# Lesson 2: New Tools for Problem Solving

# New Tools for Problem-Solving



# The Creative Thinker

- Creative thinking is a mindset. We can all be creative thinkers
- To develop a creative mindset, you need to be open to a set of principles. Its about not being constrained by assumptions or mental blockages
- You must break-away from constraints and allow your mind to think through alternative approaches before you judge whether they are right or wrong or practical or impractical

# Why our Problem-Solving Efforts Fail

Humans are hard-wired for quick decision making.

In a world of complex business processes with multiple factors at play, gut instinct often leads to wrong or ineffective decisions.

The way the human brain has evolved doesn't always support the meticulous attention to detail required to tackle some problems

1. We're pattern spotters
2. We make assumptions
3. We're task orientated
4. We're not rational
5. We're lazy

# The Principles of Creative Thinking

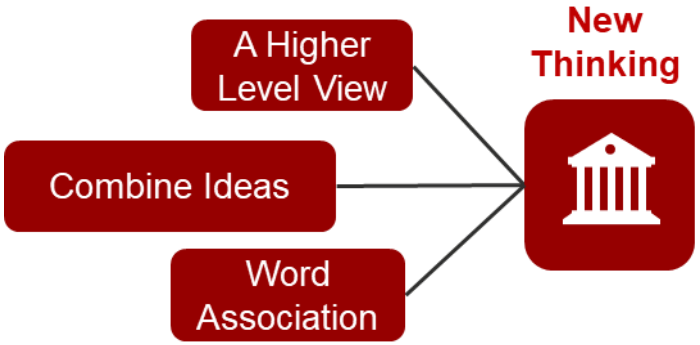
"Whether you believe you can do a thing or not, you are right".

1. View problems as a challenge
2. Be open to new ideas
3. There are no "wrong" answers
4. Avoid the blame game
5. Examine everything. Ask Questions
6. Be optimistic
7. Create the right environment

# Part 2: Problem Solving Tools for New Thinking

## Lesson 3: Tool 1: A Higher Level View

# Problem Solving Tools for New Thinking




# Tool 1: A Higher Level View

The 30,000 foot view helps give an understanding of a problem in the context of the surrounding environment and interconnecting processes.

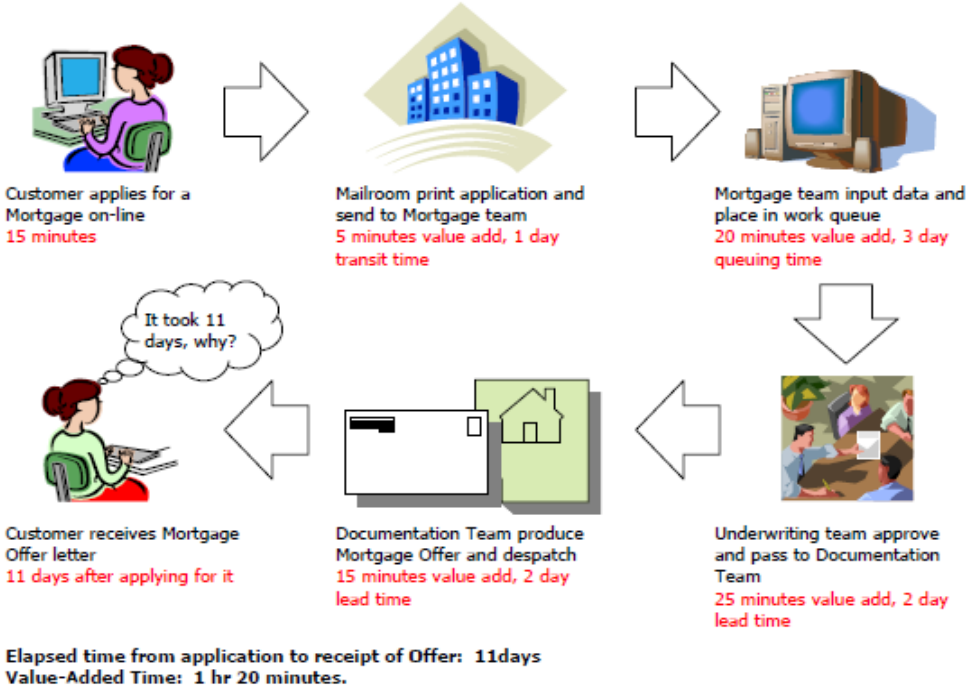
1. Create a Problem Statement
2. Ask the question: “What are we trying to achieve?”
3. Ask: “What will that do for us?”
4. Ask: “What will that do for the organisation?”
5. Draw a high-level process map which shows how that organisational level aim is achieved.

# The Problem Statement

The Problem Statement summarises the issue we are addressing in three or four sentences:

- What is the business problem we're trying to address?
- What are the consequences of the problem?
- Who is affected by this problem and how?
- What are the impacts of the problem on the customer, on the process and on the organisation?

# A Higher-Level View Example




"Currently it takes 11 days to respond to a customer's application for a mortgage. The actual time spent reviewing the application is less than 2 hours. The delay results in customer dissatisfaction and stress with around 30% of customers opting for another mortgage provider as a result of our slow service. It also means our reputation in the marketplace is poor".

# A Higher-Level View Example

1. Question 1: “What are we trying to achieve?”
2. Question 2: “What will that do for us?”.
3. Question 3: “What will that do for the organisation?”

1. Customers might be pre-approved for a mortgage
2. Customers who have other forms of credit with the bank might be pre-approved
3. The bank could automatically review the credit worthiness of each of their customers.
4. The bank might offer pre-approval for a mortgage as part of a regular financial health check.
5. The bank could develop an AI driven online pre-approval tool.

# Lesson 4: Tool 2: Combine Ideas

# Combine Ideas

It is often the case that we can take two, or more, ideas that don't quite work and bring them together into one stronger proposal.

1. List existing ideas and proposals
2. Examine the existing ideas against the Ideas Grid
3. Explore which ideas might combine with other ideas
4. Appraise the combined ideas.

# The Ideas Grid

## What?

What resources does this idea require?

What is their source and who is responsible for deploying/ managing them?

What expertise is needed to implement this idea?

## Who?

Who are the stakeholders who would implement this idea?

Which individuals or groups would benefit?

Which individuals or groups would be negatively impacted?

## When?

When during implementation is this idea activated?

When will it be completed?

Which other actions are required at the same time?

When does the idea cause problems?

## Why?

Why does this idea not fully solve the problem?

What are the unresolved issues and why do they occur?

What are the benefits of this idea?

What are its weaknesses?

# Combining Ideas

1. Which ideas use similar resources or similar expertise for implementation?
2. Which ideas involve the same stakeholders?
3. Can ideas that negatively impact a group of stakeholders be combined with ideas that positively benefit them?
4. Can ideas that would need to be implemented at the same time be combined into a single more streamlined plan?
5. Can ideas which cause problems be combined with ideas which eliminate or mitigate those problems?
6. Can ideas which have unresolved weaknesses be amalgamated with synergistic ideas to create a stronger proposal?

# Lesson 5: Tool 3: Word Association

# Word Association

We can use Word Association to change our thinking about an issue in problem-solving. It's a bit of fun to deploy when the group get stuck in a rut.

- A tool to analyse the problem
- A tool to enhance ideas generation

# Analysing the Problem with Word Association

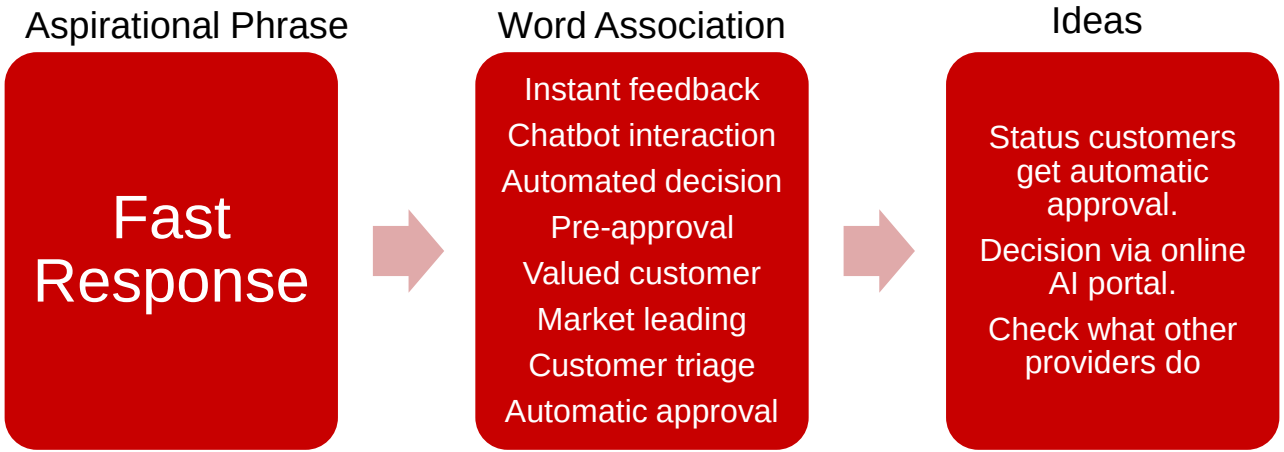
We can use Word Association to explore the problem we are facing from new points of view:

1. Discuss the problem statement with the problem-solving group and identify some key words or phrases which describe what you would like to achieve by solving the problem. These are our aspirational phrases.

2. Taking each aspirational phrase in turn, do a fast brainstorm with the problem-solving group to identify words and phrases they associate with that phrase. Continue this for as long as you get fruitful responses.

3. Use the words and phrases generated to work-up ideas that might deliver those aspirations.

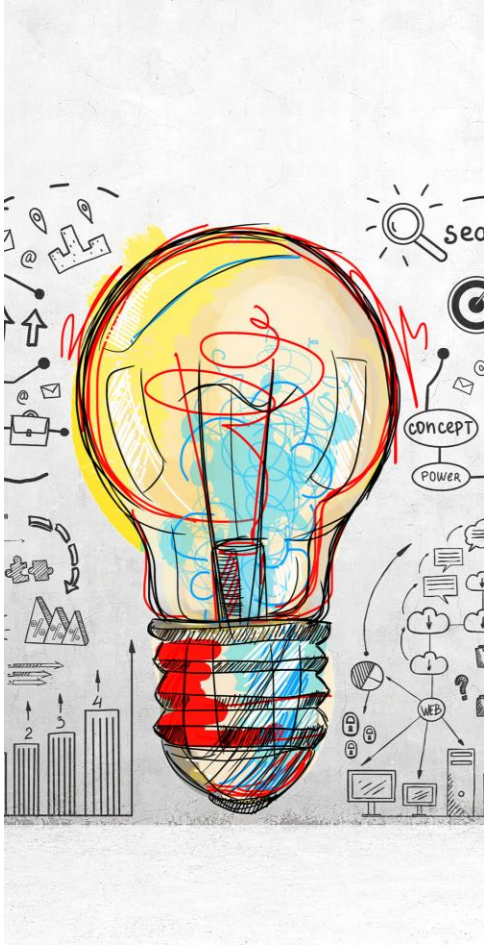
# Analysing the Problem with Word Association



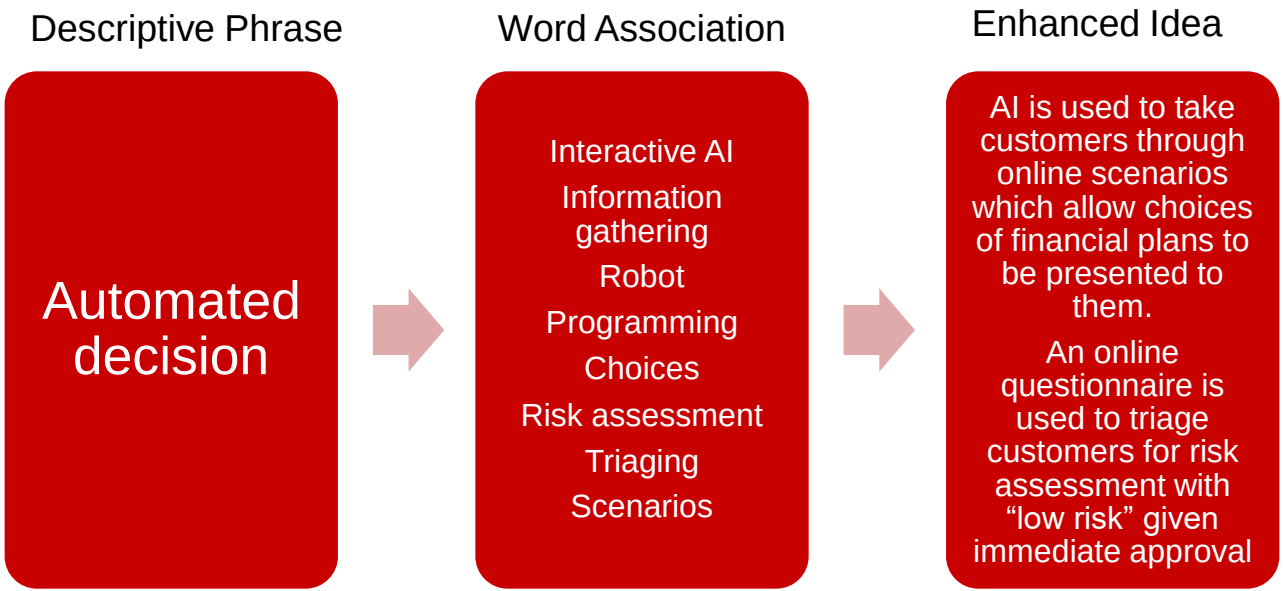
# Using Word Association to Enhance Ideas

We can use word association to enhance ideas that the group has generated in a similar way to that for analysing the problem:

- Identify some words or phrases that describe the key features of the idea being reviewed.
- Taking each phrase in turn, and do a fast brainstorm with the problem-solving group to identify words and phrases they associate with that phrase.
- Use the words and phrases generated to discuss ways in which the improvement idea might be enhanced.

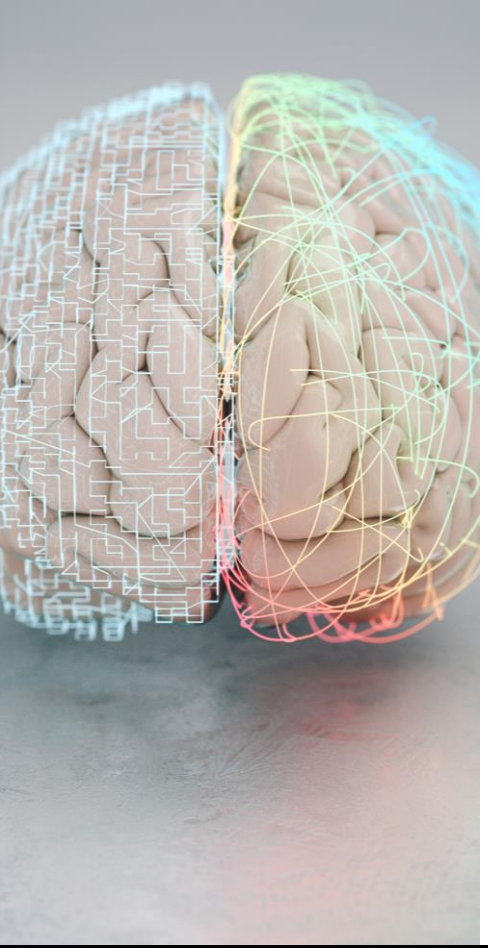


# Using Word Association to Enhance Ideas

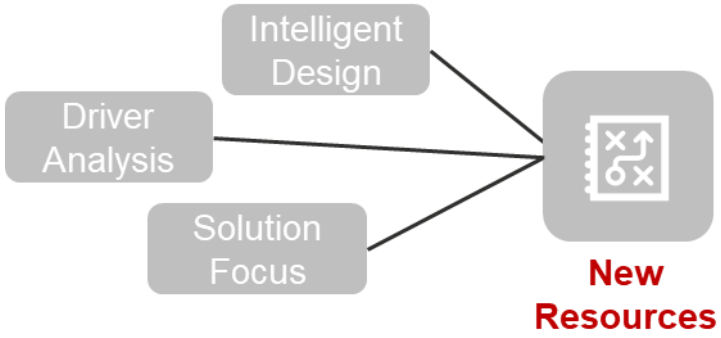


# Part 3: Problem Solving Tools with New Resources

# Lesson 6: Tool 4: Intelligent Design



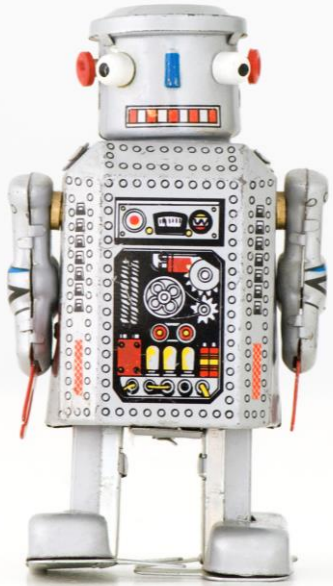
# Problem Solving Tools with New Resources




ideas into action

# Intelligent Design

- The human brain is wired to take the easy option.
- Many business problems arise because the process is too complicated or too onerous.
- Intelligent design is making it easy to operate the process correctly and hard to make mistakes.
- Intelligent design is about reviewing how a process or operation works and designing it in a way that the objective of the process is achieved in the simplest possible way.
- When the correct operation of the process or activity is the easiest, then there is no point in creating shortcuts and the risk of errors, problems and mistakes is much reduced.



# Intelligent Design

- Is the problem caused by a failure to follow the correct procedures?
- At which point(s) does the actual work done deviate from the procedure?
- What are the reasons behind the deviation from procedure?
- Is it really necessary that the procedure should be followed as written? Could the same outcome be achieved in different ways?

**Redesign the process to remove the reasons for deviation**

# Lesson 7: Tool 5: Driver Analysis and Tool 6: Solution Focus

# Tool 5: Driver Analysis

With Driver Analysis we examine the root causes of the problem in detail to identify what its drivers are.

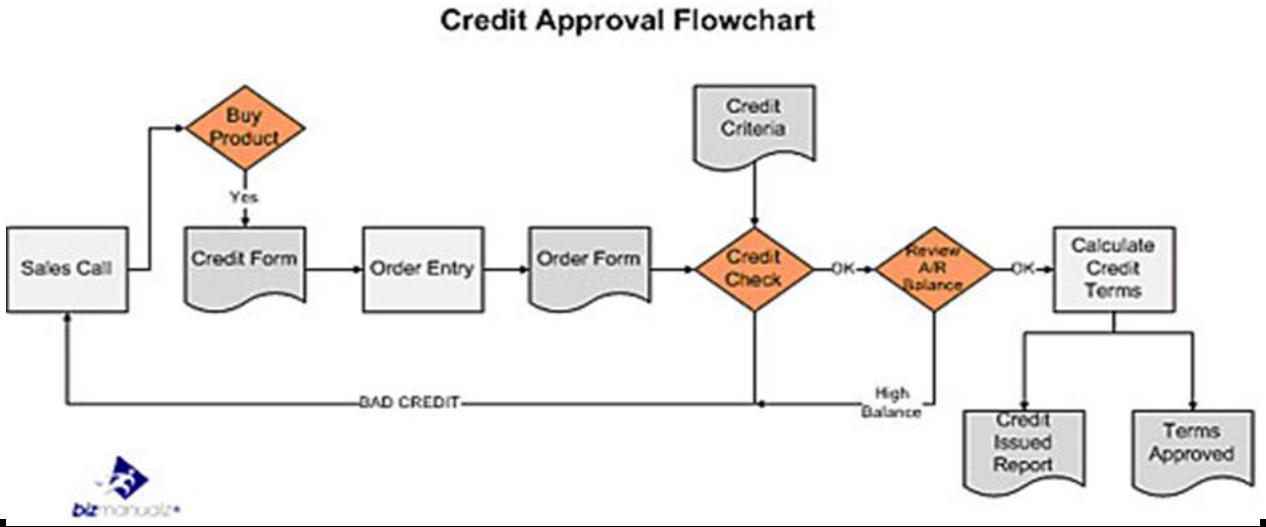
1. Map the affected process in detail to identify the step at which the problem arises. Process mapping is a good tool to use here.

2. Examine the problem step in detail to identify the root-cause issues behind the problem. The Fishbone Diagram or Ishikawa Diagram is a useful tool for this

3. Construct a Driver Diagram to identify ways of resolving the root-cause problem.

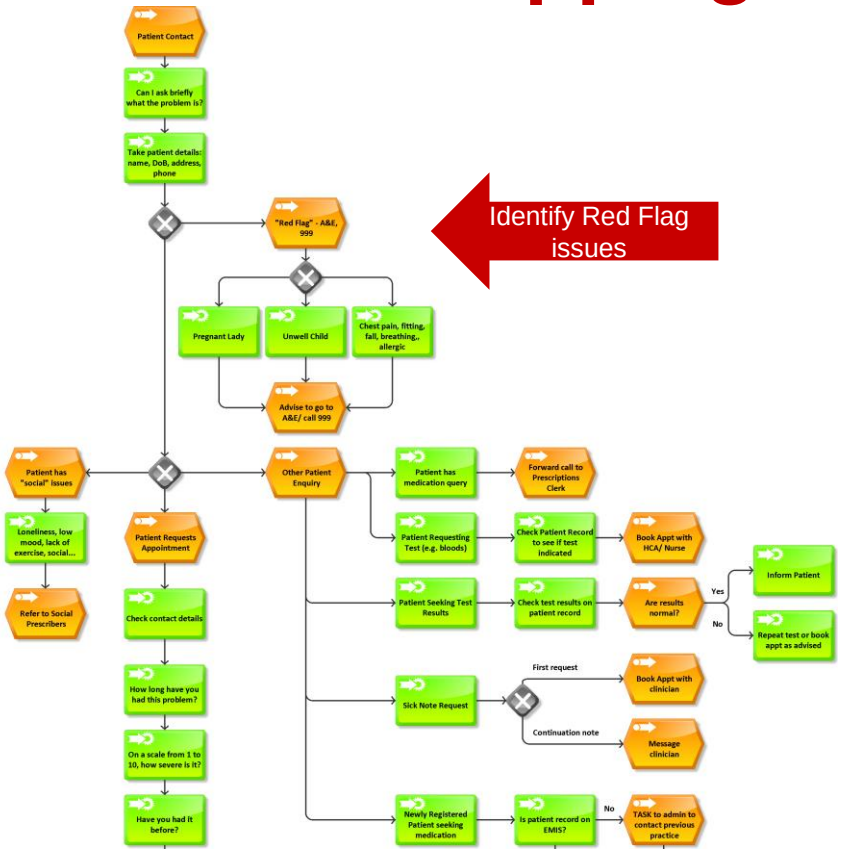
# Process Mapping

Process Mapping charts how work flows through a business process, showing every twist, and turn in that journey. It's a good way of visualising how complicated a process has become, and helps identify the point at which a problem arises




**Source: Bizmanualz.com**

# Process Mapping

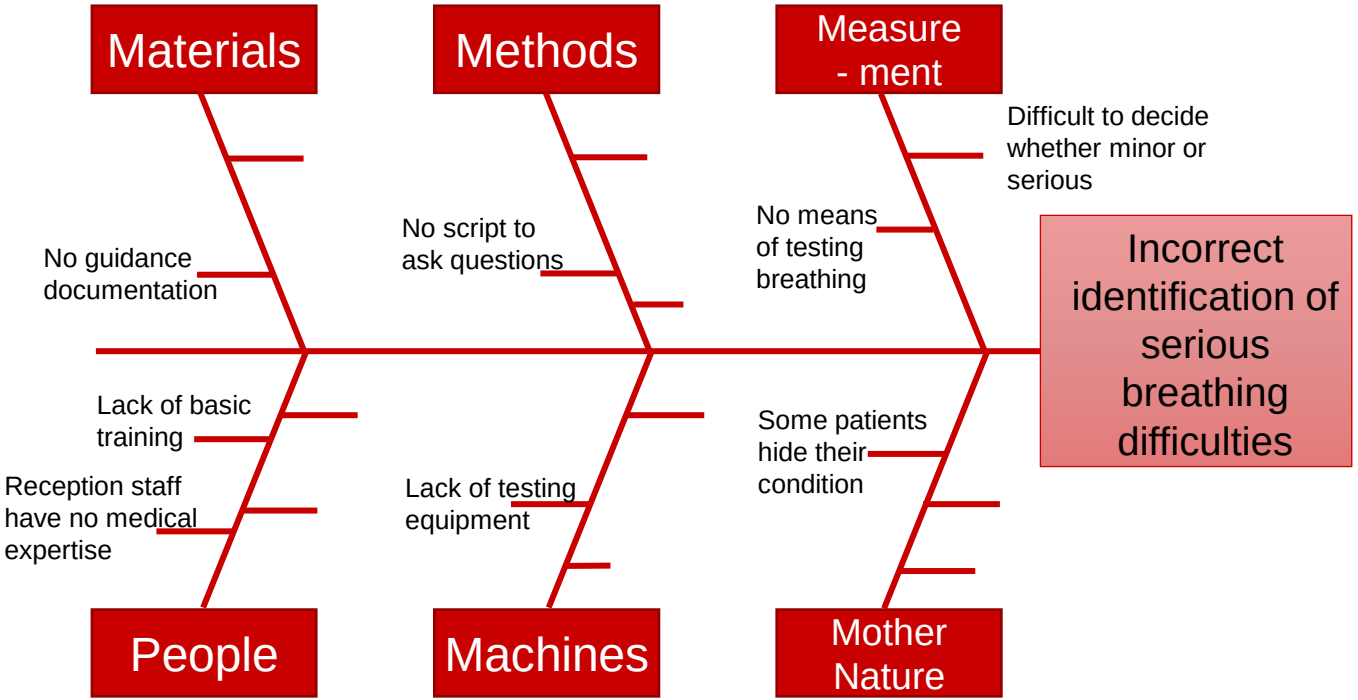


# The Ishikawa Diagram

The Ishikawa Diagram provides a structured way for an improvement team to examine the root causes of a problem. The team analyse the problem from six points of view, to give a broader understanding of the issues involved:

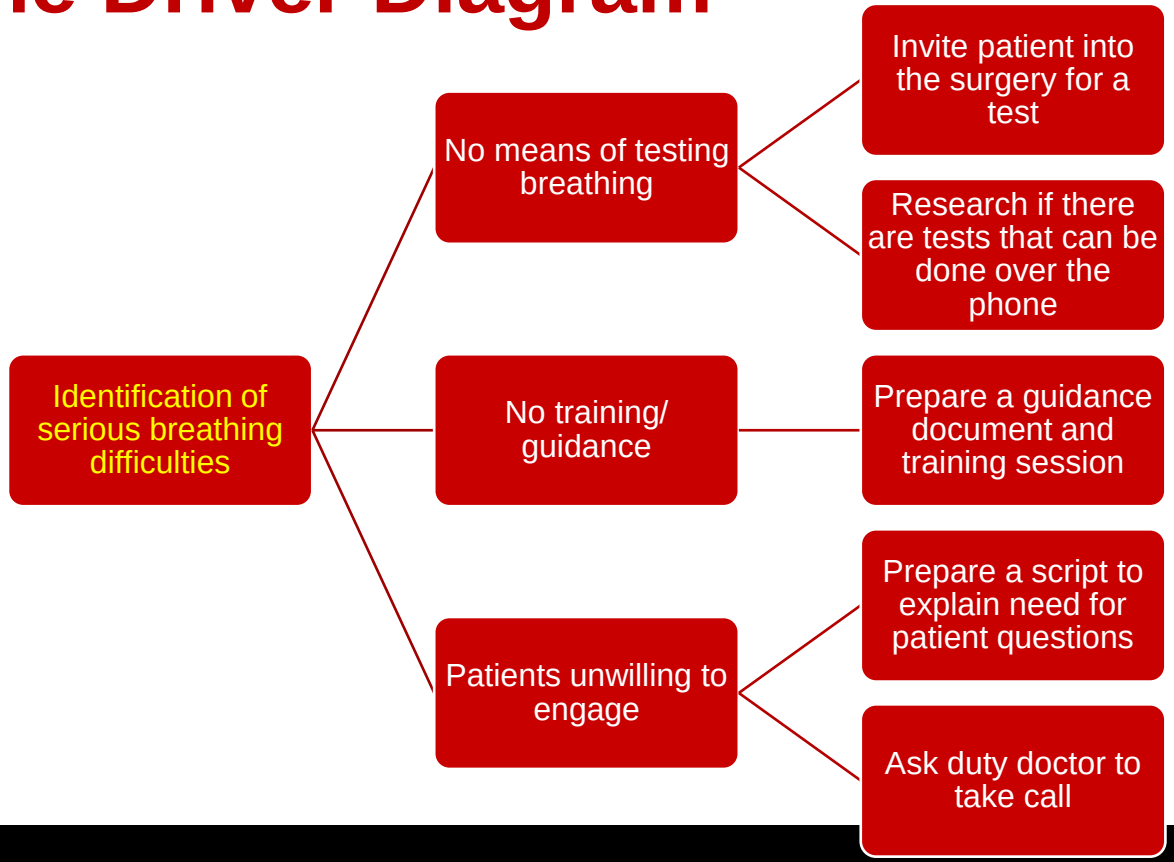
- Materials – the materials and tools used at the point the problem occurs.
- Methods – the procedures and working instructions in place.
- Measurement – the sufficiency and accuracy of the data and measures collected.
- People – the skills and capabilities of the people working in the process where the problem occurs. Note we do not seek to blame the people, but rather identify any weaknesses.
- Machines – the equipment used in the process, including IT systems.

# Ishikawa (Fishbone) Diagram



# The Driver Diagram

A Driver Diagram provides a visual representation of the factors that drive a specific root-cause or issue, and it links those drivers to proposed actions



# Tool 6: Solution Focus

- The solution focus approach ignores the problem itself and looks forward to a time when it has been eliminated.
- It asks the problem-solving team to plan what the future in the organisation might look like when the problem is resolved.
- Business processes and methods
- People and skills
- Management and Organisation Structure
- Regulation and Rules
- Performance measurement and monitoring
- Communication and Culture
- Assets and Equipment
- Customers
- Suppliers
- Other stakeholders

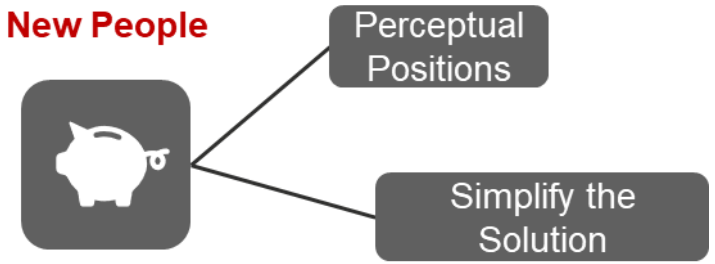
# What does Good look like?

| Goal Statement: | | | | |
|---|---|---|---|---|
| "What will be different when this problem has disappeared? | | | | |
| | | | | |
| Processes and Methods | People and Skills | Management and Structure | Regulation and Rules | Performance Measurement |
| Communication and Culture | Assets and Equipment | Customers | Suppliers | Other Stakeholders |

# Part 4: Problem Solving Tools with New People

## Lesson 8: Tool 7: Perceptual Positions and Tool 8: Simplify the Solution

# Problem Solving Tools with New People




# Tool 7: Perceptual Positions

- Perceptual Positions involves putting yourself in another person's "shoes".
- In problem-solving we use this tool to consider a problem or issue from the point of view of others.
- It opens up new ways of looking at a problem and thinking about it, and this often generates new ideas for solving the problem
- Perceptual Positions allows us to use new people in our problem solving virtually – by thinking through how they would view the problem and how they would go about resolving it.

# Perceptual Positions

- Ask one member of the group to volunteer to play the role of a new “virtual” person in the team: detective; auditor; scientist; inventor, entrepreneur, pilot, doctor etc
- The volunteer inhabits the character of the role they are playing and group members ask them questions:
  - As the character they are playing, how do they feel about the problem?
  - What do they think might be the causes of the problem?
  - What further information would they want about the problem?
  - How would they go about resolving the problem?
  - What would their first steps be?
  - What would solving this problem mean for them?
- Then ask for another volunteer to repeat this process in one of the other roles

# Tool 8: Simplify the Solution

The simplify the solution tool involves the problem-solving team working through some key questions:

1. What would happen if we didn't solve the problem?
2. What is the minimum solution that we could accept?
3. How long is a solution needed for?
4. Is there another way round the problem?

**The simplify the solution tool is about finding a less than perfect solution to the problem we are facing**

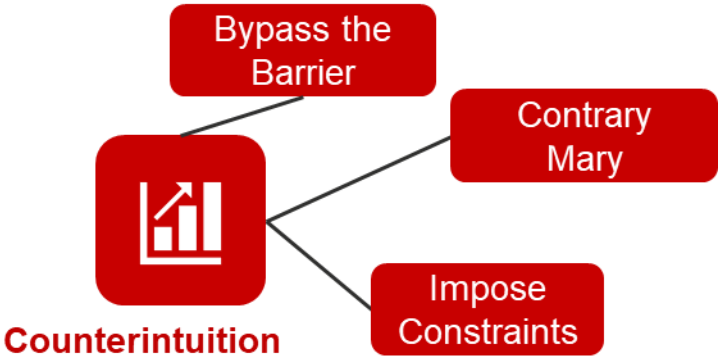
# Part 5: Problem Solving Tools using Counterintuition

# Lesson 9: Tool 9: Bypass the Barrier

# Problem Solving Tools using Counterintuition

Counterintuition is:

> “Contrary to intuition or to common-sense expectation”
>
> Oxford English Dictionary



# Tool 9: Bypass the Barrier

The Bypass the Barrier tool involves the problem-solving team discussing if there is a way of delivering the objective of the process affected by a problem that doesn't involve going through the problem.

1. Can we change the process, or the wider environment so that the problem is no longer relevant?
2. Can we change the process so that some of the drivers of the problem are no longer relevant?
3. What alternatives to this process, or this part of the process, can we develop?
4. Do we even need this process or this process step?
5. Can we break the problem down to reduce its impact?

# Lesson 10: Tool 10: Contrary Mary and Tool 11: Impose Constraints

# Tool 10: Contrary Mary

- In problem solving, a contrary argument can be beneficial as it helps us to break out of the groupthink consensus and think of other counterintuitive possibilities.
- Appoint someone in the group – male  point is that or female – to be Contrary Mary to challenge all the assumptions and proposed solutions that the problem-solving team create.
- Alternatively, the whole team can plan a 15 minute segment every couple of hours to be Contrary Marys

Sometimes we swallow things that seem obvious or logical without questioning them, but often they're assumptions that are holding us back

# Contrary Mary

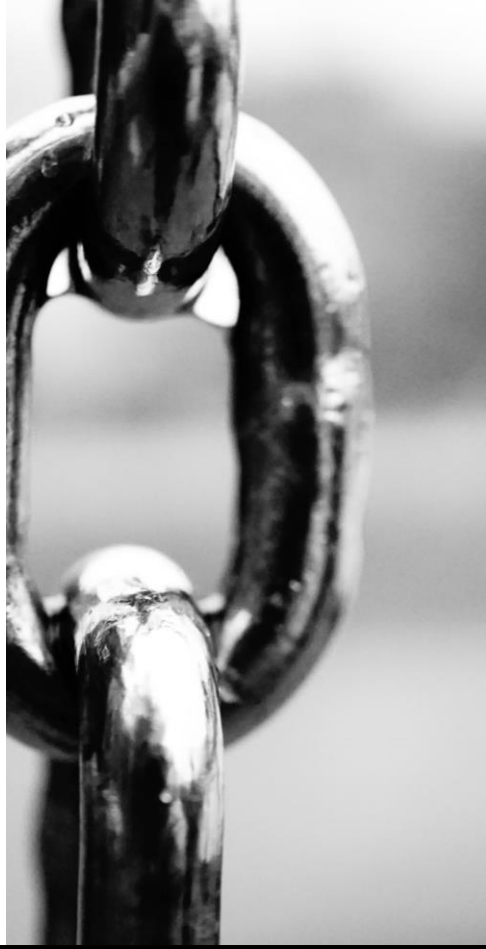
1. Ask for a volunteer to be Contrary Mary to push back against every assumption or conclusion that the team come to.
2. Alternatively, agree with the team that a “Contrary Mary” segment will built into the agenda for the session.
3. The team should scrutinise their Problem Statement. Is it based on assumptions that are open to challenge?
4. The team critically examine the validity of the assumptions they have made.
5. The team should also examine the ideas and analysis they have conducted.

# Questions for Contrary Mary

- Counterintuitive and contrary thinking add robustness to the problem-solving process by ensuring more possibilities are explored.
- Is that really true?
- What if it wasn’t true?
- Why does it have to be done that way?
- What are we taking for granted here?
- Is there another way?

# Tool 11: Impose Constraints

- Another way to stimulate counterintuitive thinking and open up new avenues for the problem-solving team to explore, is to impose artificial constraints on the problem-solving process.
- When we impose constraints on what we can do, we are forced to develop up new ideas and new proposals.
- Adding a constraint to the group's discussions will disrupt the normal patterns of thinking and force them to consider new avenues.
- The time to use the impose constraints tool is at the idea generation stage



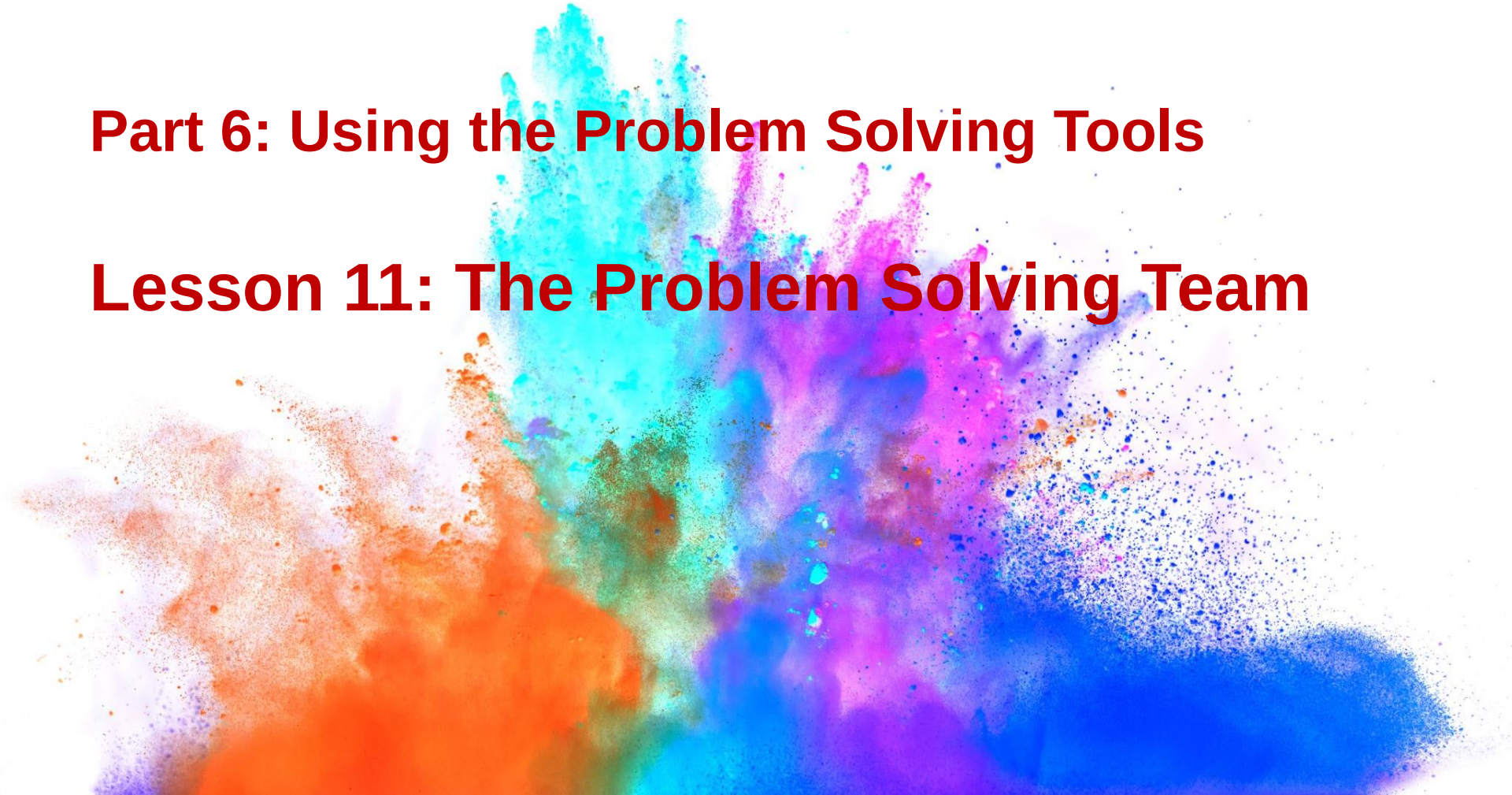
# Impose Constraints

Once the group have completed an initial brainstorm of ideas for possible solutions for the problem, the impose constraints tool can be used to access new ideas and new angles on the problem:

- The problem must be solved with current resources.
- The process must be operational again within 2 weeks (or similar tight timescale).
- The solution must *not* involve new technology.
- The solution must *not* involve more people in the process.
- The solution must remove a step or element.

# Part 6: Using the Problem Solving Tools

# Lesson 11: The Problem Solving Team



# The Problem Solving Team

- Effective problem-solving teams are diverse mixing thinking styles, experience, and viewpoint.
- An effective problem-solving team is one with six to ten members. Smaller organisations - three or four members.
  - One member familiar with the work.
  - One member to be involved in implementation.
  - One member who has no connection with the problem.
  - One member who is able to represent the group.
  - One member who has great experience of the organisation.
  - One member from engineering or production or operations.
  - One member of the team who has an understanding of costings.


# Project Timescale

1. Define the Problem
2. Analyse the Problem
3. Generate Ideas
4. Test the Solutions
5. Decide: Select and implement a Solution

- The timescale of the project depends on the size of the organisation and the size and nature of the problem being tackled.
- 8 to 16 days of team problem-solving work is a reasonable rule of thumb to deal with a fairly significant issue.

# Quantifying the Benefits of Improvement

1. Eliminating the identified problem and restoring the business process to its full capacity.
2. The process has been improved beyond its original state.
3. The saving in material costs and energy costs from a reduction in scrap and rework.
4. A reduction in inventory.
5. Improved customer satisfaction and more orders = higher contribution.
6. Improved employee morale and reduced employed turnover.

# Lesson 12: What to Use When

# What to Use When

| Stage in Problem Solving | | | | |
|---|---|---|---|---|
| Problem Definition | Higher Level View | | | |
| Problem Analysis | Word Association | Driver Analysis | Perceptual Positions | Contrary Mary |
| Idea Generation and Review | | Solution Focus | Impose Constraints | Bypass the Barrier |
| Idea Refinement and Planning | Combine Ideas | Intelligent Design | Simplify the Solution | |


ideas into action