



Ministry
of Defence

Red Teaming Handbook



Third Edition

Red Teaming Handbook

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is promulgated as directed by the Chiefs of Staff



Head of Futures and Strategic Analysis

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Foreword

‘We cannot solve our problems with the same thinking we used when we created them.’

Albert Einstein

In Defence and in wider government we recognise we live in a world where the pace of change is increasingly rapid and the challenges we face can be acute, complex and dynamic. Such complexity and uncertainty requires us to use effective critical thinking more than ever.

Defence is an institution that is both a keeper of standards and a bearer of trust. It is judged not just by what is gets done but how it functions. It is founded on a set of people with a specific culture, and way of thinking and operating. As with any human system, the organisation is fallible; susceptible to beliefs, biases and constraints which may skew our decision-making and analysis.

These human and institutional factors which drive Defence and military thinking are an important determinant of the success or failure of our policy, strategy, military operations and other endeavours. Red teaming is a practical response to overcoming the complex problems introduced by our human frailties, helping us recognise them and correct our thinking and analysis before faulty judgements are cemented in the minds of key decision-makers.

This guide offers simple advice in the use, and practise, of red teaming in Defence and aims to further raise its profile. We have designed this publication to act as a guide to those approaching the subject of red teaming and commend it to you.

A handwritten signature in black ink, appearing to be 'J. A. ...', with a long horizontal line underneath it.

Director
Development, Concepts and Doctrine Centre

Preface

Purpose

1. The purpose of the *Red Teaming Handbook* is to provide a practical guide for supporting individuals and teams who are faced with different problems and challenges in Defence. It is designed to be a practical 'hands on' manual for red teaming and is, therefore, not intended to provide a comprehensive academic treatment of the subject.

Context

2. The Development, Concepts and Doctrine Centre's *Red Teaming Guide* addressed the subject of red teaming in terms of using independent red teams to aid decision-making. This handbook moves away from the concept of red teams and introduces the concept of a red team mindset. This publication, therefore, supersedes the *Red Teaming Guide*, 2nd Edition, published in January 2013.

Scope

3. A red team mindset involves individuals and teams using red teaming techniques by as part of their everyday routines. The handbook therefore differs significantly from previous editions in that it focuses on the use of red teaming techniques that can be applied by individuals or teams to the problems they face, rather than focusing on establishing formal red teams; red teams are discussed, but this is not the central theme to this guide.

Audience

4. The first part of this handbook is aimed at a wide audience including individuals and teams faced with solving problems and making decisions across all levels of an organisation. The second part of the handbook is aimed at organisations who are considering a formal red team capability, either permanently or temporarily. Finally, the handbook is equally

applicable to both civilian and military audiences and will be of interest to all government departments.

Structure

5. This handbook is split into three parts, two annexes and a lexicon. The contents of each is described below.

a. Part 1 introduces red teaming, describes terminology for several key concepts and discusses the benefits of using this approach. This part of the handbook also discusses the human vulnerabilities that make individuals and teams susceptible to errors during information collection, analysis and decision-making.

b. Part 2 of the handbook addresses the problems and challenges faced by decision-makers because of different cognitive biases. Red teaming techniques that can help to mitigate these vulnerabilities are outlined as part of a red team mindset. The concept of a red team mindset is applying fast, simple techniques to problems across a range of situations and levels within an organisation.

c. Part 3 discusses red teams and how this capability can be developed and applied in different Defence contexts. It introduces more formal analytical techniques that can be used with more complex problems when more time is available. This part of the handbook also discusses red cells and how these teams can support a range of planning and problem-solving tasks.

d. Annex A provides worked examples for the more complex red teaming techniques to provide further guidance on how these methodologies can be used. Examples are provided for 'cone of plausibility' and 'analysis of competing hypotheses' exercises.

e. Annex B provides further guidance for teams engaged in red cell activities. The annex provides a worked example of a 'force field analysis' exercise to provide further guidance of how the technique works.

f. The lexicon of the key terms and phrases used in this handbook. It also provides brief descriptions of the red teaming techniques covered in this handbook.

Linkages

6. The *Red Teaming Handbook* is linked with: Joint Doctrine Publication (JDP) 01, *UK Joint Operations Doctrine*; and JDP 04, *Understanding and Decision-making*. This guide is also linked with the North Atlantic Treaty Organization (NATO) publication: *Alternative Analysis Handbook*, 2nd Edition.

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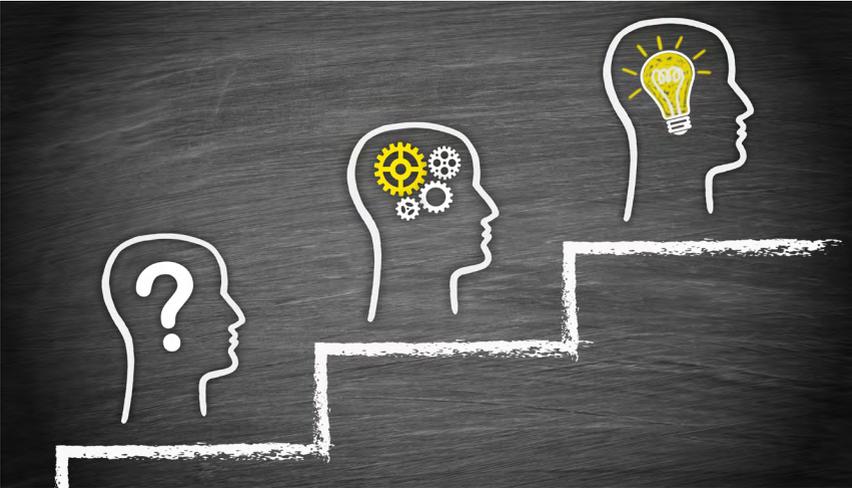
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To kill an error is as good a service as,
and sometimes even better than, the
establishing of a new truth or fact.

”

Charles Darwin



Part 1

Introduction

Part 1 introduces red teaming, describes terminology for several key concepts and discusses the benefits of using the approach. This part of the handbook also discusses the human vulnerabilities that make individuals and teams susceptible to errors during information collection, analysis and decision-making.

Chapter 1 – Overview

1.1. Red teaming has become more widely used in the UK over the last ten years. It has become recognised as a major aid to decision-making in the support functions of Defence and as a valuable tool for commanders at all levels of command.

1.2. The findings from The Chilcot Inquiry,¹ published in 2016, underscore the importance of ensuring robust and critical thinking in

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¹ UK Parliament, *The Chilcot Inquiry*, 1 July 2016.

critical situations. A number of issues were identified and raised by the Inquiry:

- the case for war as deficient;
- the intelligence regarding weapons of mass destruction was stated with misleading and unjustified certainty;
- peaceful alternatives had not been exhausted; and
- the preparation and planning for war was ‘wholly inadequate’.

There is a strong argument that red teaming the situation could have produced a more robust analysis and thus a more functional outcome.

1.3. Traditionally, red teaming has involved developing and using formal red teams, who provide an external viewpoint separate to that of ‘home team’ decision-makers and problem solvers. These teams can provide invaluable insights but can be time consuming to form and engage formally on projects. Often, there is not enough available resource to use a formal red team approach. The pace of events and rapidly unfolding nature of modern, complex problems also mean that a formal red team approach might not be sufficiently agile to meet contemporary demands. This handbook, therefore, takes a different approach. It seeks to support individuals and teams in using the types of red teaming skills encompassed in a red team by adopting a ‘red team mindset’ and applying these techniques on a day-to-day basis rather than within the context of a formal red team.

1.4. This handbook is a practical guide that sets out two different types of analytical techniques. The first set of techniques, the red team mindset, can be used in time-pressured situations that need quick assessments. The second set of red teaming techniques can be applied to more complex problems that require more deliberate judgements. In either case, the techniques described are essentially critical thinking skills that involve an unbiased analysis of information to overcome the natural biases that human beings possess. In each instance, the focus is on providing clear guidance on how to apply the techniques rather than a comprehensive discussion of all the available methodologies and the contexts in which they could be used. The aim is to make the techniques

as practical and accessible as possible so they can be applied at all levels within an organisation and to a range of problems.

Uses

1.5. Adopting either a red team approach or a red team mindset can assist both teams and individuals in a number of ways. They can:

- uncover hidden biases;
- challenge assumptions and beliefs;
- identify flaws in logic;
- widen scope of information searches;
- identify different options and alternatives; and
- stress-test a plan.



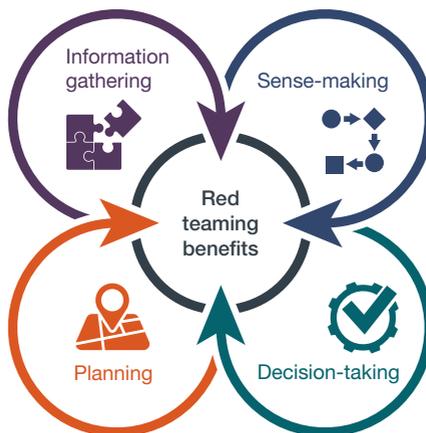
The ways red teaming approaches can assist teams and individuals

1.6. Red teaming approaches can also be used to understand a situation from an alternative perspective and explore the range of possible reactions open to an adversary or, indeed, stakeholder.

Benefits

1.7. Red teaming can be applied to, and provide benefits for, a range of information processing and decision-making tasks. It can support effective thinking at different stages.

- **Information gathering** – ensuring that an information search or information environment scan is unbiased, as wide and encompassing as possible, and is not brought to a premature close.
- **Sense-making** – guarding against preconceptions or closely held mental models that unduly influence the way an individual or team evaluates and interprets the available information and assesses risk.
- **Decision-taking** – developing the best solution to deal with the problem, one that is fit for purpose and not affected by the misapplication of inappropriate past experience or external pressures.
- **Planning** – ensuring that solutions are planned and implemented in an effective manner by guarding against over-optimism and a failure to consider contingencies, potential problems or pathways to failure.



1.8. These benefits can be achieved at all levels within an organisation and against different levels of problem complexity. Equally, they can be applied at the individual or team level. The approach can and should be used throughout the life cycle of a project to engender continuous improvement; they are vital activities that can act as a catalyst for transformation. From a strategic perspective, red teaming is an activity that our adversaries are undertaking and so it is vitally important that the UK Defence community engages in these activities as well.

Terminology

1.9. **Red teaming.** Red teaming is defined as: the independent application of a range of structured, creative and critical thinking techniques to assist the end user make a better-informed decision or produce a more robust product.² For the purposes of this handbook, red teaming is further described as a more deliberate application of red teaming techniques by individuals or teams to more complex problems. This approach uses procedural analytical techniques that can take several hours to complete. Although individuals can undertake these exercises, they are best conducted by a separate red team.

1.10. **Red team.** A red team is defined as: a team that is formed with the objective of subjecting an organisation's plans, programmes, ideas and assumptions to rigorous analysis and challenge.³ This traditional red team application is discussed in more detail in Part 3. The refocusing of red teaming away from just formal red teams to include individuals and teams using red teaming techniques and approaches introduces this new concept called a red team mindset.

1.11. **Red team mindset.** A red team mindset is a philosophy or state of mind where problem solvers and decision-makers apply red teaming techniques and approaches to everyday challenges and problems routinely. It is a habitual mode of thinking and working that involves fast and efficient approaches in time-pressured scenarios across a range of situations and levels within an organisation. The concept of a red team mindset is very similar to critical thinking.

2 Joint Doctrine Publication (JDP) 0-01.1, *UK Terminology Supplement to NATO Term.*

3 Ibid.

1.12. **Critical thinking.** Critical thinking is the robust analysis of facts to form a sound judgement. It involves the rational, unbiased analysis of factual evidence. Critical thinking is designed to overcome the natural biases that human beings bring to information processing, decision-making and problem solving.

1.13. **Red cells.** Red cells are often confused with red teams. A red cell is a team whose main purpose is to adopt the viewpoint or indeed persona of an adversary or key stakeholder. Red cells can produce several outcomes, such as developing adversary estimates and plans, as well as providing insight into how the adversary may react to friendly forces. If conducted formally as a group, the team can also role play the adversary in any wargaming exercises.

1.14. **Alternative analysis.** Finally, it is important to note that the North Atlantic Treaty Organization (NATO) has developed a similar approach to red teaming called ‘alternative analysis’, which is based largely on the previous edition of the Development, Concepts and Doctrine Centre’s *Red Teaming Guide*. NATO defines alternative analysis as ‘the deliberate application of independent, critical thought and alternative perspective to improve decision making’,⁴ whereas the new emphasis on the red team mindset used in this handbook represents a further refinement of the red teaming concept. It is also recognised that red teaming has utility across all of government, not just in Defence, and that a UK-specific handbook is therefore useful to reach this broader audience.

Cognitive biases

1.15. A major focus of this handbook is the need to mitigate against the vulnerabilities that individuals and teams have to different cognitive biases. A cognitive bias can be described as a systematic error in thinking that occurs when individuals (and teams) are searching for, processing and interpreting information and which affects the decisions and judgements made on the basis of this information.⁵ The concept of a red team mindset is to instil habitual ways of thinking and working that can help individuals

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4 *The NATO Alternative Analysis Handbook*, 2nd Edition, 2017.

5 For further detail see Joint Doctrine Publication 04, *Understanding and Decision-making*.

and teams avoid these biases and thus make more effective decisions. Red teams can be used to address these biases more formally.

1.16. There are a large number of cognitive biases that can lead individuals or teams to commit errors of judgement and decision-making. It is beyond the scope of this publication to detail and discuss them all. This handbook has instead selected a number of the more common biases to illustrate the challenges that individuals and teams can face when tackling problems. This list should not under any circumstances be taken as exhaustive or definitive, but more illustrative in nature to facilitate discussion; these biases and challenges are discussed in more detail in the next chapter.



Chapter 2 – Cognitive challenges

2.1. This chapter introduces different aspects of human cognition and psychological processes that create challenges to effective and robust information processing, data analysis and decision-making. These areas of vulnerability relate to both external pressures and internal mental processes.

External pressures

2.2. Individuals and teams can face a number of pressures from the external environment or social situation they face. The American psychologist, Robert Cialdini, identified six processes, or more correctly, 'principles of persuasion', that can influence an individual's thinking or behaviour.⁶ These principles are:

- reciprocity – individuals feel obligated to others if they have received something from them;
- liking – individuals are more influenced by people or groups they like;

.....
6 Robert Cialdini, *Influence: Science and Practice*, 2001, pages 1–17.

- consistency – individuals like to behave in accordance with what they have said or done before;
- scarcity – something becomes more appealing if it is less available;
- authority – individuals are more influenced by those who hold formal or informal power; and
- consensus – individuals look to others as a guide when they are uncertain.

Although any of these principles can affect decision-making in a Defence context, this handbook will specifically focus on the last two: authority and consensus.

Internal mental processes

2.3. Internal mental processes can also create challenges to effective judgement and information processing. One source of error is a tendency for individuals to think in fast, intuitive ways (known as system one thinking) when considering problems, rather than a more deliberate and analytical manner (system two thinking).⁷ System one thinking is suitable for everyday decisions with limited consequences but problems can arise when individuals use this approach, rather than system two thinking, to deal with more complex and consequential problems.

2.4. Regardless of whether the challenges occur as a result of external pressures or internal mental processes, the danger is that an individual will be prone to certain biases in their thinking. These biases can occur at different points within the information processing and decision-making process. Some of the most common or prevalent cognitive biases are discussed throughout this handbook; red teaming is a collection of techniques used to mitigate these biases. A series of tasks and the challenges these pose are set out below to help an individual or team to identify which challenge they are facing and therefore which red teaming technique to select.

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⁷ Daniel Kahneman, *Thinking, Fast and Slow*, 2011.

Handrail

2.5. The external pressures and internal mental processes pose challenges at different points within the decision-making or planning cycle. These are discussed below.

2.6. **Information gathering.** A key task in the early stages of problem solving is to ensure that the individual or team fully understands the question or, indeed, is answering the correct question. Addressing the correct question will ensure that the relevant information is gathered and analysed. The challenge that can occur when this task is being addressed is that the wrong direction can be given or taken. Specific red teaming techniques can mitigate this challenge. The task of searching for relevant information can also become shortened or limited for various reasons. Again, different red teaming techniques can help to ensure that the information search process is conducted as effectively as possible.

2.7. **Sense-making.** Another key task is to make sense of the information that has been gathered. At this stage, the situation needs to be assessed in terms of the risks, threats or opportunities that it might pose. The challenge posed at this stage is that the risk perception can be inaccurate for a number of reasons. Also, to interpret the information that is gathered, a decision-maker needs an analytical framework or mental model to make sense of the data. A strongly held set of beliefs or a sense of 'received wisdom' can pose a challenge to the effectiveness of this process as an individual may be overly influenced by this strong opinion.

2.8. **Decision-taking.** Decision-taking involves generating possible solutions to the problem. Individuals or teams can look to different sources for inspiration. For instance, there might be a previously defined strategy, plan or established doctrine that would be applicable to the problem; the challenge in this instance is that the decision-maker might be overly committed to an idea or action that is stipulated in the guidance. Alternatively, the individual might have worked in this area for some time and so may be prone to misapplying learning from this past experience to the new situation. Furthermore, if there is no clear guidance or relevant past experience, there might be a readily available novel solution available and the challenge in this instance is that the team might select the most

obvious solution without generating a range of options. Decision-makers or planners will be working in a team environment. The effectiveness of a team that is highly cohesive and working under strong external pressures can be challenged by dysfunctional group pressures and thus lead the team to make sub-optimal decisions.

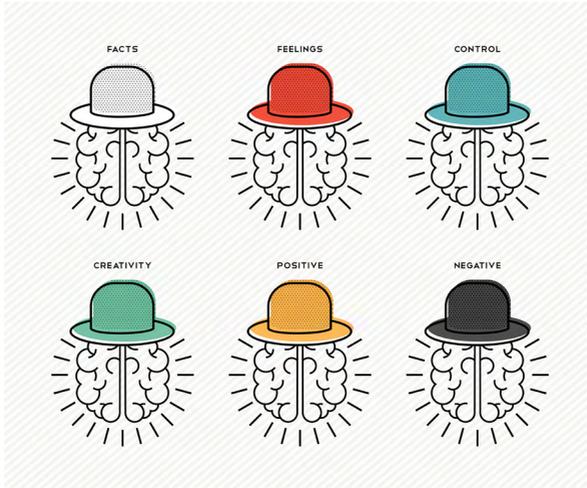
2.9. **Planning.** The planning stage of the decision-making process is an ideal opportunity to challenge ideas and strategies. The nature of the planning itself can pose challenges that need to be addressed. A strong sense of optimism or a lack of challenge can lead to overconfidence, which may lead to potential problems or pitfalls not being identified. Also, a strong concentration on the internal considerations during the planning process can lead to individuals failing to give sufficient consideration to external factors.

“

In preparing for battle I have always found that plans are useless, but planning is indispensable.

”

Dwight D. Eisenhower



Part 2

Red team mindset

Part 2 of this handbook seeks to address the problems and challenges faced by decision-makers because of different cognitive biases. Red teaming techniques that can help to mitigate these vulnerabilities are outlined as part of a red team mindset. The concept of a red team mindset is applying fast, simple techniques to problems across a range of situations and levels within an organisation. Part 2 discusses these techniques and the challenges they are designed to address.

Chapter 3 – Information gathering

3.1. The first phase of the decision-making process is concerned with how the individual attends to and makes sense of the available information, essentially the information collection stage. Issues can arise if the individual misses something in the information search either because they are directed to look in the wrong place or their search is too limited in some way.

Section 1 – Challenge: misguided by others

3.2. Clear direction about where to search for information and what is important can be useful, but problems can arise if this direction is incorrect and the individual feels compelled to follow the direction given. A failure to challenge (faulty) guidance can occur due to social pressures, either because a figure of authority has given the direction or others around the individual are complying with the direction given.

Authority

3.3. Pressure was exerted by government officials on intelligence agencies in the UK and the United States (US) to find evidence that Saddam Hussein was hiding weapons of mass destruction to justify the armed action taken in 2003. One outcome of this pressure in the UK was the now famous dossier that stated Saddam was capable of deploying chemical weapons within 40 minutes.



3.4. Authority is the principle of persuasion where an individual is influenced by someone who holds some kind of power over them. This can be formal in nature, where the other person holds a position in an organisational hierarchy or where the power comes from a legal authority.

Authority can also be informal in nature, where the power comes from acknowledged expertise, competence or experience. Individuals in Defence and military organisations are given direction by higher authority that they are compelled to follow, even though in some circumstances they may not agree with it.

The infamous psychology studies conducted by Stanley Milgram in the 1960s are a good example of obedience to authority. In these studies, participants felt compelled to give (what they thought were) painful and even lethal electric shocks to another person as part of what appeared to be an experiment on learning. The shocks were not real and the person apparently receiving them was an actor who faked the pain and distress he exhibited. Generally, the real participants who were administering the shocks were uncomfortable or even distressed about the process, but were persuaded to continue by the experimenter who pointed out how important the experiment was. The subjects essentially obeyed the authority of the experimenter.⁸



3.5. Obedience to authority is a key vulnerability that can lead an individual or even a whole group to not challenge the faulty direction that they might be given by a third party. In this case, the individual or team may search for the wrong information or look in the wrong place. Therefore, encouraging effective challenge when the direction given is questionable is a key aspect of a red team mindset.⁹

Consensus

3.6. The US space shuttle Challenger exploded shortly after launch on 28 January 1986, killing all seven crew members. A technical fault caused the shuttle to break up 73 seconds after launch. A number of reasons have been put forward for the disaster, but the subsequent inquiry found that dysfunctional decision-making processes were a key contributing factor. National Aeronautics and Space Administration (NASA) managers were aware that the rocket boosters contained a potentially catastrophic flaw which would be exacerbated by the low temperature on the morning of the launch. A number of engineers and managers were aware of the

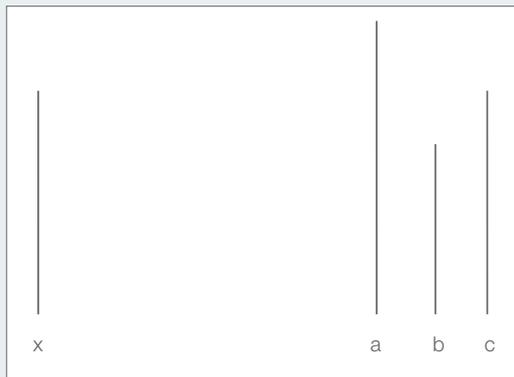
⁸ Miles Hewstone, et al., *An Introduction to Social Psychology*, 2015, pages 264–270.

⁹ Ira Chaleff, *Intelligent Disobedience*, 2015.

issue but failed to adequately report these technical concerns to their superiors, partly because others were maintaining a silence and going along with the prevailing intention to launch the shuttle.

3.7. Consensus is the principle of persuasion where an individual looks to others as a guide for how to proceed, especially when they are uncertain of what direction to take. It is a form of group or peer pressure. Individuals in Defence and military organisations often work in teams and so there are many opportunities to defer to others in complex and ambiguous situations.

Solomon Asche, an American psychologist, studied the consensus effect in a series of experiments on conformity in the 1950s.¹⁰ In these studies, subjects were asked to judge which of three lines was the same length as another line; the answer was generally unambiguous. The subject was part of a panel taking part in the study, Asche was interested in what would happen when all of the other panel members (who were stooges in the study) gave incorrect answers at different points. Interestingly, 75% of participants went with the consensus view at least once out of the 12 times when the other panel members gave the wrong answer.



An example of the lines used by Asche

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10 Miles Hewstone, et al., *An Introduction to Social Psychology*, 2015, pages 247–249.

3.8. Deference to the consensus view is another key vulnerability that can lead an individual to not challenge a prevailing mindset; if the group opinion is wrong, the individual will search for the wrong information or look in the wrong place. Ensuring that group consensus does not prevail is, therefore, another key aspect of a red team mindset.

Other biases

3.9. Other cognitive biases can also cause problems in an information search. These include:

- shared information bias – a tendency for groups to spend more time discussing shared information than unshared information;
- worse-than-average effect – a tendency to believe that others have more competence or expertise and thus defer to them;
- reciprocity principle – a tendency to be influenced by others that the individual feels obligated to; and
- liking principle – a tendency to be more influenced by people the individual likes.

Situations where it is possible that decision-makers could be misguided by others can be mitigated in time-pressured situations by both red team mindset techniques and, where more time is available, red teaming methods.

Solution: everyone speaks once before someone speaks twice, seniors speak last

3.10. The failure to challenge because of issues of deference to authority or seniority and pressure to comply with the consensus view can lead to narrow viewpoints and information searches as voices can become stifled. This is especially the case if there are inexperienced or less senior members of the team involved in a discussion. Often it is the more junior members of a team who are better informed on the subject.

3.11. ‘Everyone speaks once before someone speaks twice, seniors speak last’ is a very simple and easy to implement technique. As the title suggests, the idea is that when discussing an idea, and especially in brainstorming sessions, everyone in the group contributes before someone speaks twice. More senior individuals go last in the round. The technique is flexible and can be used in different ways. It can be used:

- once at the start of a discussion after which the floor can be opened up to a general discussion;
- as each new topic is introduced; or
- in a more formulaic manner with the whole discussion sticking to the process.

If used in a formulaic manner it is important to keep a tally of who has spoken and vary the order (of less senior members) for each subsequent round. Participants can pass on any particular round if they have nothing to add and then contribute on a later round if something has occurred to them.

3.12. This approach ensures that those hesitant to speak are less intimidated and no one person or set of individuals dominate the discussion. Employing this technique helps to generate a wider set of inputs and creates a platform where constructive challenges can be made early in a process.

Section 2 – Challenge: limited information search

3.13. A wide and exhaustive information search is important to ensure that a full and comprehensive picture is obtained. Information will be missed if the information search is too narrow in its focus or it is brought to a premature closure. A rapid information search might be a suitable approach if time is short; however, regardless of whether there are certain time pressures, psychological biases can lead to a less than efficient collection of information.

Goal-directed behaviour

3.14. In the lead up to the Tet Offensive in 1968 during the Vietnam War, the US Military Assistance Command, Vietnam believed that the Viet Cong enemy would attack the isolated US base at Khe Sanh in the north of South Vietnam. A French military force had previously been trapped and defeated in a similar base, Dien Bien Phu in 1954. The US authorities were concerned that history would repeat itself with US forces being trapped and defeated in a similar manner. This concern meant that attention was focused on Viet Cong activity around Khe Sanh and extensive intelligence efforts were devoted to that area. This misdirection is one reason why the multiple warnings about the forthcoming Tet Offensive were not fully appreciated at the time.

3.15. One psychological mechanism that can lead to errors of observation and thus an incomplete information search is goal-directed behaviour. This occurs when an individual has a strong or clear preconceived idea of what they are looking for or expecting to happen. The information search becomes narrowly focused on this idea and the individual does not attend to other aspects of the environment. Alternatively, the information search can be halted when the pre-identified piece of information has been noticed.

The ‘invisible gorilla’ study, conducted in 2010 by two psychologists, Chabris and Simons, is a good example of the phenomenon of goal-directed behaviour (or inattentional blindness).¹¹



In this study, participants were instructed to watch a video of two teams (of three people) passing a basketball to each other. Their task was to count the number of times one team passed the ball; this was the ‘goal’. During the video, someone dressed in a gorilla suit walked across the screen, stopped, beat their chest and then walked off. When asked if they saw anything of interest other than the basketball players, roughly half of the subjects failed to spot the ‘gorilla’. Use of eye-tracking technology indicated that the subjects actually looked at the gorilla but did not ‘see’ it as they were focused on another task and not expecting it.

11 Christopher Chabris and Daniel Simons, *The Invisible Gorilla*, 2010.

3.16. Starting an information search or setting out with too clear an idea of what the problem is (being goal-directed) can therefore lead to a narrowed focus or premature closure of the search. Even if other key information is available, the individual may not even attend to it if it is not what they are expecting. Keeping an open mind and ensuring that information searches are not too focused is, therefore, another key red teaming skill.

Selective perception

3.17. Rising tensions between Egypt, Jordan and Israel led to the outbreak of the Yom Kippur War in October in 1973. In the run up to the outbreak of war, two Palestinian terrorists seized five Jewish emigrants and a customs official in Austria in September 1973. As a result of the incident, the Austrian authorities closed the migrant transit centre at Schonau Castle in Austria; this was a major transit centre for Jewish emigrants. The Israeli authorities were outraged. The Prime Minister, Golda Meir, personally invested a lot of time attempting to deal with the situation. This focus served to distract her and the Israeli government's attention away from the increasing indications of the joint Egyptian and Jordanian attack that started the war.

3.18. Another psychological mechanism that can lead to errors of observation and key pieces of information being missed is selective perception. This occurs when something grabs an individual's attention and they become fixated on this aspect. Selective perception is similar to goal-directed behaviour in that the fixation means that the information search is too narrow or is cut short. The difference between the two mechanisms is that with selective perception, the individual does not enter into the situation with a preconceived goal; the novelty or apparent significance of the piece of information grabs and dominates the person's attention.

3.19. Halting the information search process and concentrating on a particular issue can, therefore, lead to a narrow focus or premature closure of the search. This fixation means that other developments or key pieces of information might be missed.

Other biases

3.20. Other cognitive biases that can cause the premature closure of, or taking an incorrect direction in, an information search include:

- the need for cognitive closure – desire for a confident judgement on an issue or to have closure as quickly as possible; and
- the scarcity principle – a tendency to act prematurely and reach a decision quickly when timescales are perceived to be short.

Keeping the information search process going and ensuring that it does not get fixated on a particular issue is, therefore, another key aspect of a red team mindset.

Solution: issue redefinition

3.21. An information search can be too narrow, overly focused on a particular area or brought to a premature closure if the individual or team conducting the search has too strong an idea of what to look for or becomes fixated on a particular point. This narrowing of focus can also come from only considering the particular features and issues of the specific problem being faced. External factors that could shape the problem can easily be forgotten. Issue redefinition can reduce the risk of missing important internal and external issues early in a planning process.

3.22. Issue redefinition follows a set of clearly defined steps. These are listed below.

1. Rephrase – redefine the problem without losing too much meaning. Does this definition indicate other areas of information that should be gathered?
2. Question – ask a series of ‘why’ and ‘how’ to explore different aspects of the problem. What new areas of information emerge from this process?

3. Broaden the focus – take a step back and look at the bigger picture, or the problem in a broader context. What new questions does this wider perspective generate?

4. Narrow the focus – break the problem down into constituent parts and explore these in more detail. What information gaps are identified?

5. Reverse the question – turn the problem on its head and look at the issue from the opposite perspective. Does this radically different view create new areas of insight into the problem that need to be explored further?

3.23. This approach, if used early in a problem solving or planning process, can help to ensure that information searches do not become too narrow in focus and instead consider wider issues. Formally creating new lists of issues to be addressed can also help to ensure that the information search is not brought to a premature close.



Chapter 4 – Sense-making

4.1. The second phase of the decision-making process is concerned with how an individual interprets or makes sense of the information that they have developed in the information gathering stage. Thinking at this stage is concerned with considering a range of issues, such as whether the information is relevant, significant, threatening or supportive. Issues can arise if the individual dismisses the information as irrelevant or insignificant, or conversely incorrectly assesses it as important when it is not.

Section 1 – Challenge: faulty risk perception

4.2. A key aspect of judgements about relevance, significance or threat is the individual's perception of risk. A number of psychological mechanisms can affect an individual's risk perception and thus frame how they assess the relevance, significance or implications of a piece of information.

Framing

4.3. One of the key incidents in the events that led up to the surprise attack on Pearl Harbour by the Japanese Navy on 7 December 1941 was the imposition by the US of an embargo on oil imports into Japan. Both Japan and the US correctly calculated that Japan's oil reserves would be

used up within six months, however, they viewed the outcomes differently. The US viewed the embargo as a means to bring Japan to the negotiating table, in other words, it would ‘gain’ from the embargo. The Japanese government framed the situation differently, it viewed the embargo as leading to a ‘loss’. It viewed the embargo as frustrating its ability to expand its empire and attain the territory it desired. It was therefore more willing to take the risk of attacking the US as it was focused on avoiding the potential losses that scaling down its ambitions would entail.

4.4. The manner in which a question or problem is framed can have a significant effect on how an individual perceives the risks associated with the situation. The way in which a task, problem or question is phrased, either by the individual or a third party, will therefore have an effect on the manner in which risk is perceived.

4.5. Studies have shown that a problem phrased in a positive manner in terms of the potential gains that could be achieved from taking a course of action (such as the number of lives that might be saved), tends to make individuals less likely to take risks.¹² People tend to prefer sure gains. Conversely, if the problem is framed negatively, in terms of the potential losses that could occur (such as the number of deaths that might ensue), individuals tend to take more risks. This difference occurs even when the probabilities of lives saved or deaths incurred are essentially the same. Risk appetite can therefore be determined in part by the manner in which the problem is framed. Ensuring that issues, questions or problems are framed or defined in the correct manner is a critical red team mindset skill.

Exposure effect

4.6. Hurricane Katrina struck the east coast of the US in August 2005. It caused 1,800 deaths and an estimated US \$125 billion in damage. New Orleans was particularly badly affected. Key contributing factors to the death toll were the slow and inefficient reaction of the local authorities and the refusal of thousands of people to leave the city in the face of warnings from weather forecasters. The area was subject to hurricanes and other adverse weather events, and scientists had made repeated warnings about the inability of the local defences to withstand a Category 5

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12 Daniel Kahneman, *Thinking, Fast and Slow*, 2011, pages 363–374.

hurricane. Exposure to previous weather events and a series of warnings worked in part to desensitise the authorities and the public to the risks they faced.

4.7. An individual's perception of the significance of an event or piece of information and the risk that it poses can be affected by their familiarity with the issue in question. In basic terms, the exposure effect means that the more an individual becomes exposed to something, the more familiar it becomes and thus less interesting or threatening. The first exposure to something can be interesting, exciting or frightening, but repeated exposure means the individual becomes used to the experience. As can be seen from the Hurricane Katrina example, one technique in military deception is to habituate the enemy to an activity by repeating it many times before the real event so that when the activity is undertaken for real it feels part of the usual routine.

Other biases

4.8. Other cognitive biases can also cause an incorrect appreciation of risk. These include:

- ambiguity effect – a tendency to avoid options where the likelihood of a good outcome is not known;
- base rate neglect – a tendency to focus on case-specific data and give insufficient consideration to the background information or the base rate;
- conjunction fallacy – a tendency to assess that a more specific situation is more likely to happen than a more general situation; and
- zero-risk bias – a preference for completely eliminating a small risk rather than partially mitigating a larger risk.

4.9. Individuals or teams analysing the same sorts of scenarios can become overexposed to the situation and thus habituated to the significance of the information to which they are exposed and the risks

involved. Therefore, ensuring that issues are examined in a robust fashion each time they are assessed is another key aspect of a red team mindset.

Solution: what if analysis

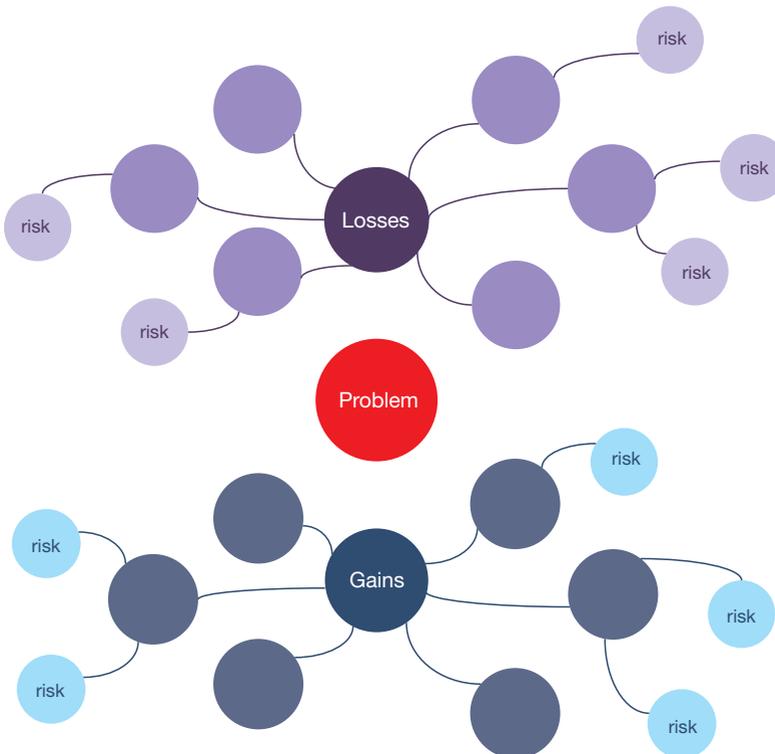
4.10. A major determinant of the way in which an individual or team orients towards a problem is the relevance or significance that is attached to the problem or issue. A key aspect of this judgement is the level of risk that is perceived. Risk perception can be affected by the way that the problem is presented or 'framed', or the level of familiarity that the person has with the problem or situation. It is important, therefore, to consider as widely as possible the potential risks in a situation.

4.11. What if analysis can help individuals and teams consider risk more broadly. Traditional what if analysis involves imagining that a plan has failed and working backwards to determine what might have caused the failure. The red team mindset approach to what if analysis reverses this process. It starts at the beginning and imagines the different possible pathways to failure. This approach to what if analysis follows a series of steps.

1. Clearly state the problem as succinctly as possible. Write this definition in a circle in the middle of a page.
2. Draw a circle above the problem definition with 'losses' written in it.
3. Repeat this below the problem definition with 'gains' as the label.
4. Using the definition of the problem, list or brainstorm the possible losses and gains. Keep the potential losses/gains as high-level categories.
5. Using a mind mapping approach, draw 'branches' off the losses and gains circles, each branch representing a new loss or gain.

6. Continue the process by developing sub-branches of each key theme to identify the possible risks associated with each potential loss or gain.

4.12. This approach helps to ensure that the level of risk is framed properly by considering a wide range of issues, especially both potential gains and losses. In this way, the level of relevance, significance or threat can be properly established.



An example of what if analysis

Section 2 – Challenge: influenced by strong opinions

4.13. To make sense of incoming information, an individual needs to have some kind of preconceived idea or framework of understanding in mind for organising the data and assessing its relevance or significance. For example, a commander needs to have an idea that the enemy has strike aircraft available to interpret reports of aircraft approaching as potentially hostile. Problems can arise when these mental models are so firmly entrenched that they become a hindrance rather than an aid to understanding. A number of cognitive biases can serve to protect a strongly held view and thus lead to skewed judgements and decision-making.

Confirmation bias

4.14. In 1998, a study was published in the British Medical Journal that linked autism with the measles, mumps and rubella (MMR) vaccine. The study caused great controversy and led to a significant number of parents choosing not to vaccinate their children or opt for the less effective single vaccinations. The study linked correlational data of an increase in MMR vaccinations with a rise in the diagnoses of autism and crucially attributed a causal link. The article was retracted after it was shown that the author had manipulated or ignored data because of a desire to establish a link between the vaccine and autism.

4.15. Confirmation bias is the tendency to search for, notice, attend to and process information that agrees with or confirms a closely held idea or hypothesis. In this way, information that supports a preconceived notion is more readily accepted and given less scrutiny. A similar issue is change blindness. This occurs when an individual has a strong expectation that something will happen or indeed stay unaltered and then does not notice when something is changed.

The confirmation bias mechanism was demonstrated in a 1998 study conducted by Simons and Levin in which subjects failed to notice when someone they were having a conversation with changed to a different person.¹³ Around half of the subjects failed to notice the switch that occurred when the conversation was interrupted by people carrying a door between the two participants and the other individual swapped with another person.



4.16. Holding strongly held views can therefore lead to less rigorous appraisal of information, more ready acceptance of information that supports the notion, and less sensitivity to a change in circumstances. One of the principles of effective military deception is to present the enemy with a course of action or idea that fits within their current beliefs. This principle, therefore, uses confirmation bias to good effect. Clearly identifying and discussing expectations or preconceived ideas when evaluating information, along with robust self-criticism, are therefore key aspects of a red team mindset.

Cognitive dissonance

4.17. The German invasion of the Soviet Union in June 1941 gained strategic surprise. Russian troops were not prepared to meet the onslaught. Stalin had forbidden meaningful preparations despite numerous warnings from the British government and his own intelligence services. He denied, dismissed or explained away these various reports because he knew his forces were not ready, in part because of his own purges of senior officers during the 1930s. An acceptance of the incoming intelligence would have meant Stalin would have had to address some uncomfortable truths. His method for dealing with the 'cognitive dissonance' was to refute the warnings.

4.18. Cognitive dissonance is similar to confirmation bias in that it relates to a skewed interpretation of information; the difference between the two is that cognitive dissonance involves a more active denial and dismissal of conflicting information. Cognitive dissonance was first identified in the 1960s in a series of studies that examined the different ways in which

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 13 Christopher Chabris and Daniel Simons, *The Invisible Gorilla*, pages 59–60.

contradictory information was negated (such as challenging the credibility of the source) to protect the preconceived idea or closely held belief.¹⁴ Cognitive dissonance occurs when there is a discrepancy between a firmly held belief or mindset and incoming information. The conflict can be resolved in one of two ways. Either the person can adjust their mindset to accommodate the new information and change in circumstance, which is psychologically taxing, or refute the information in some way so that it does not pose a challenge. If the mindset is firmly entrenched and deeply valued, the conflict is greater and the dissonance is more acute. In this instance, the coping mechanisms aimed at negating the information (such as denial or questioning the credibility of the source) can be quite extreme in nature to reduce the dissonance.

4.19. Using existing understanding or mental models for making sense of incoming information can be useful. However, frameworks that are too entrenched can be dangerous and need to be challenged to ensure they are not skewing analysis.

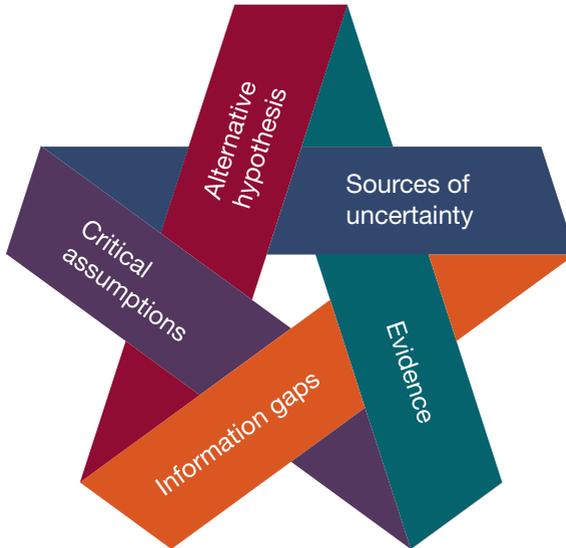
Other biases

4.20. Other cognitive biases can also cause decision-makers to be adversely affected by strong opinions. These include:

- ostrich effect – ignoring an obvious negative situation if it challenges the ‘received wisdom’; and
- contrast effect – a tendency to evaluate something by comparing it to a contrasting experience.

As with confirmation bias, clearly identifying and discussing expectations or preconceived ideas when evaluating information, along with robust self-criticism, are key aspects of a red team mindset.

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¹⁴ Scott Plous, *The Psychology of Judgment and Decision Making*, 1993, pages 22–30.



Solution: structured self-critique

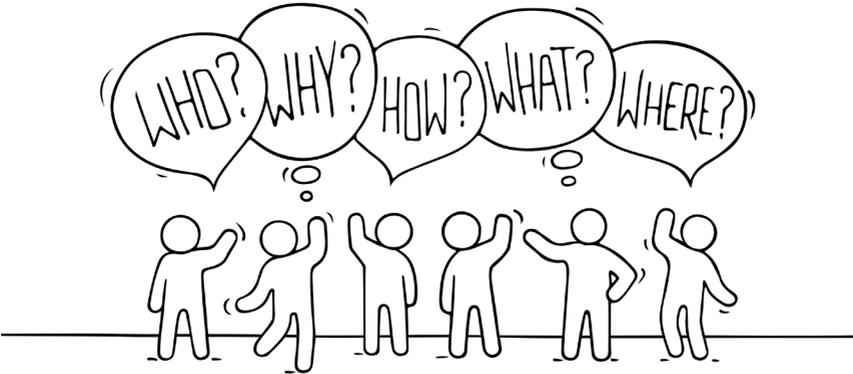
4.21. A preconceived idea or framework for understanding can help make sense of incoming information. Problems can arise when these mental models are too firmly established, for example, when there is a long-held 'received wisdom' or individuals hold strong opinions on the subject. The danger is that individuals or teams can be selective in attending to the available information or distort its meaning to suit an agenda. It is important, therefore, to adopt a critical approach to evaluating the way information is processed.

4.22. The structured self-critique technique involves asking a series of questions to evaluate the quality of information processing. These questions fall under the following headings.

- a. **Sources of uncertainty.** Is there likely to be a single correct or most likely answer (is the situation a puzzle) or a wide range of possible answers which partly depend on future developments (a mystery)?

- b. **Evidence.** What information is available to use as ‘diagnostic’ evidence to evaluate different possible answers; how relevant or robust is this evidence; and/or is there any anomalous information?
- c. **Information gaps.** What gaps in the information are there; how big or critical are these gaps?
- d. **Critical assumptions.** What assumptions have been made (especially if these were made to fill in information gaps); how critical are these assumptions; and how clearly have they been acknowledged?
- e. **Alternative hypotheses.** Were alternative hypotheses generated and considered; are there other possible explanations or possible forecasts that could have been made?

4.23. This technique is only as good as the honesty with which it is conducted. However, posing the questions in a systematic way at least prompts the individual or team to challenge an established view and the manner in which the information fits this stance or not.



Chapter 5 – Decision-taking

5.1. The third phase of the decision-making process is concerned with how an individual reaches a conclusion or judgement based on the information that has been processed in the earlier diagnostic phase. Thinking at this stage is related to developing a strategy or approach for solving the problem or responding to the situation. Problem issues can arise if the individual uses inappropriate analogies to aid problem solving or is not sufficiently flexible in their thinking and so draws the wrong conclusions. A number of psychological mechanisms can cause these biases to occur.

Section 1 – Challenge: overly committed to an idea or action

5.2. Problems can arise when an individual or team is strongly committed to an idea or way of doing something. Doctrine, a predetermined strategy or a set of tactics, techniques and procedures are useful methods for providing guidance and instilling a uniform approach, however, difficulties can occur if these are adhered to too rigidly or held in too high a regard. A number of cognitive biases can serve to stimulate and reinforce a strong adherence to traditional approaches.

Endowment effect

5.3. Various US presidential administrations continued to prosecute the war in Vietnam and indeed escalated US military involvement. Starting with Eisenhower, then Kennedy, Johnson and finally Nixon, presidents continued to commit (more) troops partly because of a belief that the war could be won. There were other contributing factors, but seeking a peaceful end to the conflict would have meant abandoning the notion that the war could be won and that communism could be checked in the Far East.

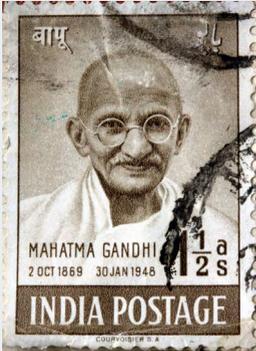
5.4. The endowment effect refers to the psychological mechanism where an item, either an object or an idea, is more highly valued when it is owned by the individual. The high value placed on the object or idea means that it then becomes difficult to give it up.

5.5. Individuals or teams who are very familiar with certain concepts, doctrine, strategy, tactics or plans can, therefore, be less likely to develop new and different approaches to problems. This is especially the case when the individual or team were responsible for developing the ideas. Stimulating wider thinking, and especially encouraging consideration of the broader implications of an issue, is a key component of a red team mindset.

Anchoring

5.6. As the Allied and German forces faced each other in 1940, the British and French High Commands had to decide how the Wehrmacht would execute the anticipated attack in the west. They had the advantage of a readily available answer, the Schlieffen Plan. This was the German scheme that was used in World War 1 in similar circumstances and involved a northern hook through Belgium and Holland. It seemed like a fair assumption that the Wehrmacht would repeat the movement and so Allied forces were deployed accordingly, despite indications that this would not be the case. The French and British High Commands essentially became fixed on this idea and failed to adjust their strategy accordingly. The German attack eventually came from the Ardennes in the south, effectively cutting off the advanced British and French forces.

5.7. Anchoring is a mental shortcut or heuristic where the individual, when considering a problem, uses a prompt or past experience as the starting point for their thinking. The problem is that the prompt acts like an anchor and the individual typically fails to adequately adjust their thinking away from this starting point.



The anchoring heuristic has been demonstrated in a variety of academic studies. In one study, subjects were first asked to state whether Gandhi was older than either 40 or 80 years of age when he died. They were then asked to estimate his actual age when he died. The first question essentially acted as an anchor as subjects who were given the 40 years old question consistently gave a younger age at death than the group who received the 80 years old prompt.¹⁵



5.8. Having a prior example to work from, a well-established approach or set of procedures can mean that an individual or team can misapply a wrong solution to a problem or not make sufficient adjustments to a previously used solution. This issue is particularly relevant when individuals are dealing with probability-based estimates of the likelihood of events occurring in the future or estimates about confidence in judgements.

Other biases

5.9. Other cognitive biases can also cause decision-makers to be overly committed to an idea or action. These include:

- the IKEA effect – a tendency to have greater ownership over something when the individual or team has developed it themselves;

¹⁵ Daniel Kahneman, *Thinking, Fast and Slow*, 2011, pages 119–128.

- sunken costs – a tendency to carry on with something because resources such as time, effort or money have already been invested in it;
- plan continuation bias – an inability to notice or accept that an original plan of action is no longer appropriate for a changing situation;
- loss aversion – a tendency to feel potential losses more keenly than potential gains; and
- consistency principle – a tendency to behave in accordance with previous commitments or actions.

5.10. Encouraging novel thinking and a critical appraisal of the (new) aspects of a problem set are, therefore, critical features of a red team mindset. Red teaming a problem during the decision-taking phase can help an individual or team to move away from an uncritical acceptance of the status quo.

Solution: high impact – low probability analysis

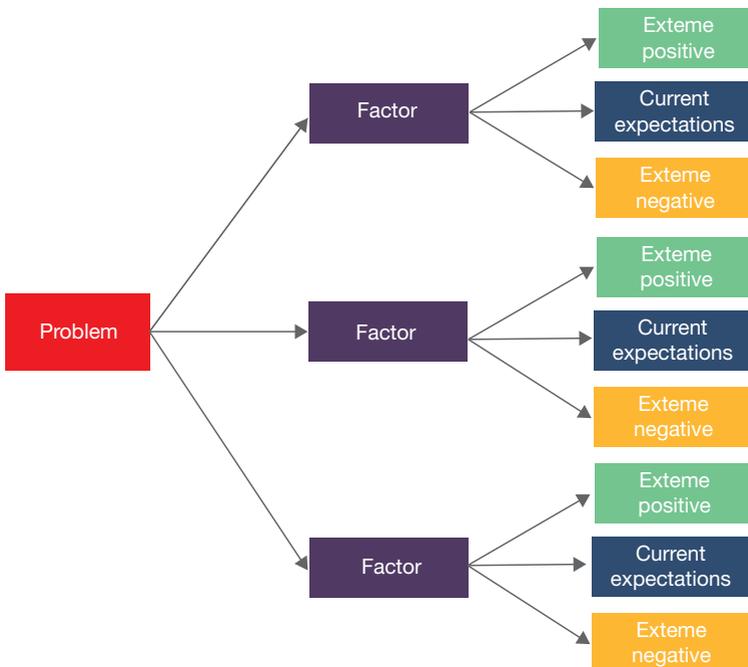
5.11. A strong commitment to a strategy or plan of action can cause difficulties if it is adhered to in a rigid manner and not subjected to critical examination. Individuals or teams can become overly committed to a plan for a number of reasons. A key driver is whether the team developed the plan themselves and so invest too much ownership in it. Standard practices can also be applied without enough thought given to their applicability and this might lead to insufficient adjustments being made. It is important, therefore, for decision-makers to push the boundaries of their problem solving.

5.12. A variation of high impact – low probability analysis can help decision-makers to consider a wide range of events, especially those they might not consider likely. The technique incorporates the following steps.

1. Clearly state the problem as succinctly as possible.

2. List two to four factors that will shape how the situation is likely to unfold, these should be stated in a neutral fashion such as ‘the weather’, ‘the terrain’ or ‘enemy morale’.
3. For each factor, describe how current expectations or standard procedure suggests the situation will develop; for example, ‘low morale means the enemy will surrender at the first opportunity’.
4. Repeat the process for each factor but with extreme negative developments that would significantly impact the plan.
5. Repeat the process again but with extreme positive developments that would have significant impacts.

5.13. The key is to assess the impact of these (unlikely) outcomes on the plan. In this way individuals and teams can be encouraged to be more flexible in the way in which they develop their thinking.



An example of high impact – low probability analysis

Section 2 – Challenge: misapplication of past experience

5.14. More problems can arise if a team or individual has past experience of dealing with a similar problem. Individuals or teams can become too focused on this previous history and be dependent on the status quo view; this leads to difficulties in imagining novel or different threats or problems. A number of cognitive biases can underlie this adherence to the status quo.

Status quo bias

5.15. In the run up to the 2016 US presidential elections, most of the estimates showed an overwhelming majority for the democratic nominee Hillary Clinton. Various polls and informed commentators had the probability of a Clinton victory as high as 90%. There are a number of reasons why these pre-election estimates were so inaccurate, such as Donald Trump supporters being under-sampled and not stating their voting intentions correctly. One factor, however, was that few professional observers of the American political landscape could imagine that such an unconventional candidate could win.

5.16. Status quo bias is, strictly speaking, a preference for the current state of affairs. Individuals suffering from this bias have difficulty in moving away from the status quo as any change is seen as an unwelcome loss. This handbook looks at the bias a little more broadly and views it as a focus on the present and past state of affairs. In this way, events or issues are seen as not changing in nature, or at least only slowly evolving over a long period of time, and, therefore, threats or challenges are seen as essentially staying the same.

5.17. This bias means that low probability but high impact events become hard to visualise or imagine because of the fixation on the current state of affairs. Nicholas Taleb famously called these types of events ‘black swans’.¹⁶ On a similar theme, revolutionary changes in threats can

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¹⁶ Nassim Taleb, *The Black Swan*, 2007.

also be missed as these represent a quantitative change in the status quo. Revolutionary changes in weapons (such as the use of atomic bombs against Japan in 1945) or tactics (such as the Wehrmacht's use of Blitzkrieg tactics in 1940) have often led to surprise on the battlefield. A key red teaming skill is, therefore, an ability to challenge the status quo and 'received wisdom' and consider a wider range of less probable problems and threats.

Hindsight bias

5.18. During the early stages of the Coronavirus pandemic in 2020, many commentators believed that the virus would not affect the rest of the world and would remain a localised disease, as had been observed a number of times before. The draconian lockdown measures employed in the affected area were seen within the framework of human rights abuses, which had been observed in the country before and for which the Chinese government had a long history. In this way, expert judgements were coloured by familiarity with previous outbreaks and examples of population control rather than the new evidence at hand.

5.19. Hindsight bias also relates to past experience but refers to a psychological mechanism whereby an individual convinces themselves after an event that they had accurately predicted it before it happened. This view can then lead the individual to believe that they can accurately predict other events.

Studies have shown that participants who were asked to forecast the outcome of future events tended to believe that they had predicted the outcome accurately even when they had not (or at least were more confident in their predictions than they were at the time).¹⁷



5.20. The danger with hindsight bias is that an individual or team can, at worst, be unjustifiably confident in a plan or solution because the situation is analogous to an event that they believe they had 'called' correctly before. At best, previous experience can be misapplied to the current situation.

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17 David Hardman, *Judgement and Decision Making: Psychological Perspectives*, 2009, pages 36–38.

Other biases

5.21. Other cognitive biases can also cause decision-makers to misapply past experience. These include:

- conservatism bias – a tendency to fail to revise thinking when presented with new information;
- continued influence effect – a tendency to continue to believe misinformation even after it has been challenged; and
- normalcy bias – the inability to plan for a (negative) situation that has never occurred before.

5.22. Previous experience of a problem set clearly has benefits for an individual or team, particularly for ensuring that the decision-taking is well informed. Critical analysis of previous experience and consideration of how the current situation differs from the past are, however, important red teaming skills.

Solution: assumptions check

5.23. Past experience of an issue can clearly be helpful in terms of providing useful guidance on how to tackle a particular situation. Problems can arise when this past experience is not applicable to the current situation. This misapplication can occur if decision-makers assume that the current situation is a repeat of previous occurrences, the current situation is unlikely to change dramatically or they are overconfident about their previous performance in solving similar problems. If the assumptions are made at the beginning, then problems will continue to unfold during the planning and problem-solving process and are only likely to grow in magnitude and severity.

5.24. Assumptions check is a technique in which both implicit and explicit assumptions, based on past experience, can be examined and checked. The technique involves a number of steps.

1. Identify an existing estimate that describes the situation or plan for dealing with the problem. Alternatively, write out a description of the problem or situation.
2. Analyse the description and highlight explicit assumptions; these are statements where the assumption is clearly stated.
3. Analyse the description and highlight assumptions that have not been explicitly stated; phrases such as ‘typically’, ‘generally’, ‘experience has shown’ and ‘would have to be’ indicate these implicit assumptions.
4. For each assumption, ask the following questions.
 - o How valid is this assumption?
 - o What is the impact if it is invalid?

Challenging assumptions in this manner can ensure that assertions based on past experience are valid and applicable to current problems.

Section 3 – Challenge: select the most obvious solution

5.25. Another problem can occur when there is a readily available or widely recognised way of viewing a situation or a clearly articulated solution to a problem. The problem is that the readily available view or solution is adopted without sufficient critical appraisal. A well-researched judgement bias called the availability heuristic underlies this tendency.

Availability heuristic

5.26. After the terrorist attack on the World Trade Centre on 9 September 2001, Americans stopped flying and turned to driving around the country in large numbers. The fear of flying and a repeat attack loomed large in American minds. An objective assessment of the risk would have suggested that flying was far safer. It has been calculated that even if terrorists were committing a similar attack on a weekly basis,

the chance of dying in such an incident was 1 in 135,000 (based on flying once a month for a year). Conversely, the chances of dying in a road traffic accident was 1 in 6,000. It has been calculated that the shift to driving cost an extra 1,595 lives. The problem lies in the fact that the image of death in a terrorist airline hijacking became much more vivid and easy to imagine, looming much larger in people's thoughts and so affected their risk assessment.¹⁸

5.27. The availability heuristic is a mental shortcut where an individual, when asked to think of something, recalls the most available answer. In this sense, it is a reflection of the rapid 'system one' type thinking. The problem is the most readily available answer is not necessarily the correct solution. It can be most readily available because it has been discussed at length within the individual's circle, most publicised in the media or is more dramatic and therefore just easier to imagine.

5.28. Numerous studies have examined the availability heuristic. For example, in a similar fashion to the example discussed above, studies have shown that participants believe they are more likely to die in an aeroplane crash or a terrorist attack than more mundane causes of death such as diabetes (which kills far more people every year).¹⁹ A well-rehearsed or discussed concept, strategy or plan can therefore be wrongly adopted if insufficient analysis of the situation has not been undertaken.

Other biases

5.29. Other cognitive biases can also cause decision-makers to incorrectly select an obvious solution. These include:

- default effect – a tendency to favour the default option when presented with a choice;
- salience bias – a tendency to focus on items that are more prominent or emotive and ignore those that are less striking; and

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¹⁸ Dan Gardner, *Risk: The Science and Politics of Fear*, 2009, pages 3–4.

¹⁹ Gerd Gigerenzer and Peter Todd, *Simple Heuristics That Make Us Smart*, 1999, pages 56–57.

- selection bias – a tendency to notice something more when something causes people to be more aware of it.

An important red team mindset skill is, therefore, to ensure sufficient analysis of a situation is undertaken by generating other possibilities to be considered.

Solution: brainstorming

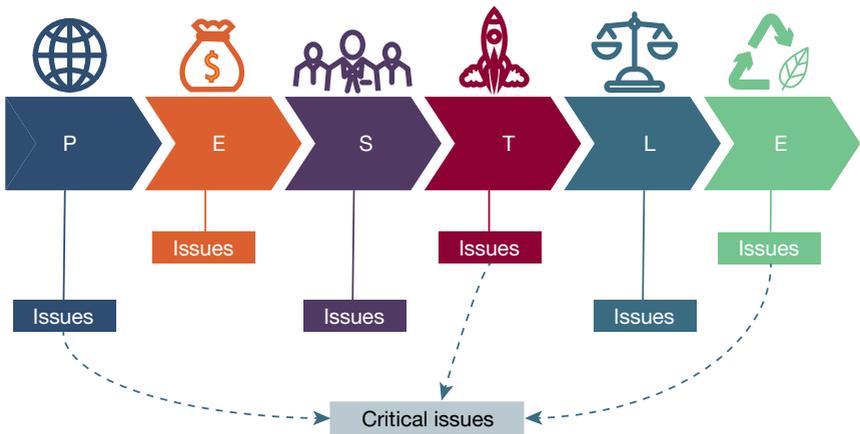
5.30. Decision-makers can take shortcuts in solving problems, especially when under pressure to act, such as short timescales. Uncertainty or ambiguity can also compel individuals or teams to adopt a course of action prematurely to reduce stress and anxiety. In these instances, it is tempting to select the easiest or most obvious solution. A readily available answer can in these instances be adopted when it is in fact not the best solution. It is, therefore, important to ensure that, even when time is short, a wide range of ideas or solutions are generated and considered.

5.31. The simple technique of brainstorming can help to ensure a wider and more diverse approach to problem solving. This technique can be as short or as lengthy as time permits. It is best conducted in a group, but an individual can still generate a broader set of solutions if they take the time to brainstorm. Although the technique is simple, a couple of considerations or approaches can help facilitate the process.

- a. If possible, participants should be encouraged to write down suggestions before contributing to a brainstorming session. This can be done before the session or at the beginning of a discussion.
- b. A group should ideally consist of between four and eight contributors, six is an ideal number. Fewer than four participants can result in not enough diversity of thought, a group with more than eight members can be unwieldy and slow down the process.

- c. When sharing ideas, the ‘everyone speaks once before someone speaks twice, seniors speak last’ approach can be effective to encourage those who are reticent to contribute.
- d. A structure, such as the political, economic, social, technological, legal and environmental (PESTLE) framework, can be used at the end to prompt further ideas.
- e. It is important not to critique or challenge ideas during the process.
- f. Anonymous voting at the end of the session is useful to obtain an unbiased consensus view.

Encouraging a creative and equal environment for sharing and developing ideas in any format will help develop a richer solution to a problem.



The political, economic, social, technological, legal and environmental framework

Section 4 – Challenge: group pressures

5.32. Decision-taking is often undertaken in a group or team environment. Two or more heads are often better than one but there is a danger that the dynamics of a group can lead to less functional and ineffective decisions. A well-known psychological phenomenon or process called groupthink can be a cause of poor group decision-taking.

Groupthink

5.33. The Enron accounting scandal became public in 2001; it led to the bankruptcy of the Enron Corporation and the dissolution of its accounting partner Arthur Andersen. Key Enron executives, such as Kenneth Lay and Jeffrey Skilling, created a staff that exploited accounting loopholes to hide billions of dollars in debt. This close-knit group operated with an increasing detachment from reality and growing sense of invulnerability. Various members of staff within Enron and Arthur Andersen were pressured to ignore the issues. Group pressures are viewed as playing a key part in the actions of these individuals and so this incident is seen as an excellent example of groupthink.

5.34. Groupthink is a psychological process that was first studied in the 1960s by Irving Janis.²⁰ It refers to the internal social pressures that can lead a closely knit (and generally high-functioning group) to commit errors of judgement. Groupthink is most likely to occur when there:

- is a high degree of group cohesiveness;
- are stressful situational factors, such as external threats; and
- are structural issues within the group such as a lack of impartial leadership.

5.35. These factors can lead to a variety of problems that hamper effective decision-taking. These problems include:

- illusions of unanimity within the group;

.....
20 Irving Janis, *Groupthink*, 1982, pages 1–72.

- direct pressure to conform to the consensus view;
- illusions of invulnerability;
- self-censorship; and
- stereotyping of the out group or adversary.

All of these issues can lead to less rigorous analysis of problems, stifling of creativity and poor decisions.

Other biases

5.36. Other cognitive biases can also cause teams to fall foul of groupthink-type problems. This includes knowledge curse, whereby more knowledgeable people find it difficult to think about problems from the perspective of lesser-informed people. Being mindful of group pressures and encouraging open debate and challenge in a team are, therefore, key aspects of a red team mindset.

Solution: mindguarding

5.37. Teams are vulnerable to a particular type of bias due to the group nature of the activity; groupthink is a well-known phenomenon and is a phrase that is commonly used. Several factors can lead to groupthink such as a charismatic, biased leader and the presence of a stressful external threat. This can lead to problems in decision-taking, such as pressure for group members to conform and illusions of unanimity within the team. It is important, therefore, that highly cohesive teams take steps to guard against groupthink.

5.38. Mindguarding can be an effective tool to prevent groupthink. This technique is comprised of different factors.

- Team leaders should avoid expressing clearly preferred options or opinions, especially early in the process.

- Team leaders should not attend certain sessions to avoid influencing the outcome.
- Team members should each be encouraged to adopt the role of ‘critical evaluator’ to facilitate the airing of doubts and objections.
- Team members should adopt the role of devil’s advocate on a rolling basis to challenge the group; better still, an external devil’s advocate could be employed.
- Team members should be encouraged to discuss ideas with trusted people outside of the group.
- Where possible, outside experts should be included in meetings.

5.39. Some of these provisions may be a little cumbersome at first or difficult to implement in practice, especially the role of devil’s advocate, but guarding against groupthink can help teams to make better decisions. Simply spending some time thinking about the impact of group pressures and acknowledging these openly can pay dividends.



Chapter 6 – Planning

6.1. The fourth phase of the decision-making process involves checking that the analysis and planning outcomes are robust and fit for purpose. Problem issues can arise at this stage if the individual or team fails to think things through in sufficient detail or consider critical factors that might affect the plan.

Section 1 – Challenge: overconfidence

6.2. A significant problem that can occur when an individual or team is developing a plan of action is an overly optimistic assessment of the likelihood of success. Overconfidence in the plan could be based on successful past experience, wishful thinking or an over-inflated view of the individual's or team's competence or ability to affect the situation. A tendency towards optimism can bring about this overconfidence.

Optimism bias

6.3. There are numerous examples of construction projects that have taken much longer and were more expensive to build than were originally optimistically estimated. The building of the Sydney Opera House is perhaps the most famous example of over-optimism in a planning process. The Opera House was originally estimated to be completed in

four years at a cost of Australian (A) \$7 million. In reality, the build took 14 years and cost A\$102 million.

6.4. Optimism bias simply refers to a tendency for an individual to believe that they are less likely to experience a negative event. In planning and decision-making terms, it refers to an overly positive or confident belief that the plan will work.²¹

6.5. The impact of optimism bias on planning and decision-making is that the sense of positivity may mean that the plan is not subjected to sufficient critical analysis. More specifically, the potential problems that may adversely affect the plan might not be identified and thus effectively mitigated.

Other biases

6.6. Other cognitive biases can also cause decision-makers to be overconfident in their solutions. These include:

- neglect of probability – a tendency to disregard the probability of certain outcomes or events when making a decision; and
- outcome bias – a tendency to judge a decision by its eventual outcome instead of the quality of the decision made at the time (the plan worked more through luck than judgement).

A key red team mindset skill, therefore, is to adopt a critical view once a plan has been developed and identify the potential pitfalls that might exist.

Solution: devil's advocacy

6.7. When plans are developed to implement strategies or decisions they can suffer from a variety of weaknesses. One common problem is an exaggerated sense of confidence that the plan will succeed. This overconfidence is often born of a tendency towards optimism and a

.....
²¹ David Hardman, *Judgment and Decision Making: Psychological Perspectives*, 2009, page 104.

reluctance to accept that things could go wrong. It is, therefore, important to examine a plan and explore the possibility that it could fail.

6.8. Devil's advocacy is a simple red teaming technique that can be used to challenge the confidence in a plan and identify any weak points that might exist. The term refers to the position of *advocatus diaboli* (devil's advocate) which was introduced into the Catholic Church by Pope Sixtus V in 1587. The devil's advocate's role was to argue against the merits of a candidate for canonisation as a saint. It involved adopting a contrarian position to identify the candidate's flaws to ensure that the candidate was indeed suitable.

6.9. Devil's advocacy can be used to identify the potential flaws in a plan and thus challenge any sense of overconfidence and force decision-makers to reconsider their approach. The process is simple and straightforward. Once the plan has been developed, the devil's advocate argues that it will fail and more importantly identifies the reasons why.

6.10. Devil's advocacy can be conducted by the individual on their own plan; however, this is difficult and involves some tricky mental gymnastics. It is better for a member of the team, especially one who has not been too involved in developing the plan, to undertake the role. In this instance, it is better to rotate individuals in the role across different plans or at different points in the planning process. Care should also be taken to ensure that the devil's advocate is not too adversarial in tone and that any criticism is not given or taken personally. It is also important that the role is not just paid 'lip service' and the challenges are taken seriously. If not, the important points raised by the devil's advocate could be lost and, worse still, the flawed process can instil more confidence in the plan because it has apparently been tested, when in reality it has not.

Section 2 – Challenge: failure to consider external factors

6.11. Another problem that can occur is for a team or individual to be too inwardly focused when developing a plan of action. This inward focus can mean that external factors that can affect the plan are not given sufficient

consideration and thus mitigation measures or contingencies are not fully developed. One particular cognitive bias called the planning fallacy underlies this tendency.

Planning fallacy

6.12. ‘Not enough thought had been given to the obstacles produced in a built-up area where free movement was so hampered.’ This was Roy Urquhart’s (General Officer Commanding 1st Airborne) admission that the planning for his division’s drop on Arnhem was too internally focused. A number of external factors were missed during the planning process: the urban nature of the environment which hampered movement; the quick and fierce reaction of the German defenders; and the benefits that would have been gained by seizing the Heveadorp-Driel ferry and the Westerbouwing Heights.

6.13. The planning fallacy technically refers to the tendency to underestimate the time required to complete a future task.²² This is partly based on optimism but also due to a lack of consideration of external factors that might delay or disrupt the task. For the purposes of this handbook, it is taken to mean a narrow, inward focus of planning a task, with a consequent neglect of external factors. The impact is on not just the time required but also the likelihood of success more broadly.

6.14. The well-known dictum that a plan does not survive contact with the enemy is particular apposite here. A focus on internal capabilities and a failure to consider (the impact of) external factors can mean that a plan is left as a hostage to fortune and sufficient contingencies or risk mitigations have not been fully considered.

Other biases

6.15. Other cognitive biases can also cause planners to not sufficiently consider external factors, for example, illusion of control where there is a tendency for a person to overestimate their influence over external events. Adopting an outward-looking focus and identifying the external factors

²² David Hardman, *Judgment and Decision Making: Psychological Perspectives*, 2009, page 108.

that might adversely affect the plan is, therefore, another key component of a red team mindset.

Solution: outside-in view

6.16. A common point of failure of plans is that they do not give sufficient consideration to the impact of external factors, such as weather conditions or reactions of the adversary. Planning can often be undertaken in an insular manner and just focus on internal considerations. Encouraging teams or individuals to sufficiently consider and account for the impact of external factors is, therefore, an important issue for ensuring plans are robust.

6.17. Outside-in thinking simply involves viewing the problem from an external perspective and follows a set of clearly defined steps.

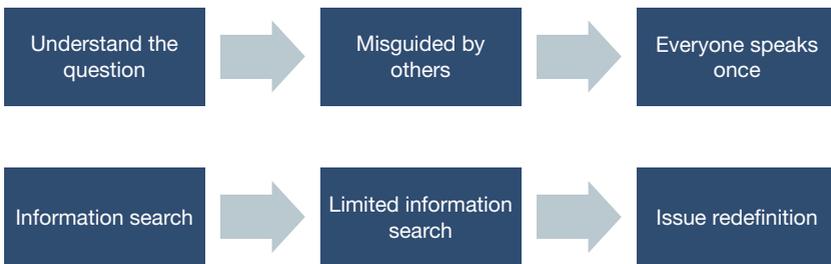
1. Clearly state an overview of the plan as succinctly as possible.
2. Create a table or set out a list with the PESTLE headings.
3. Using this summary, under each heading, list or brainstorm the issues that may impact on or be impacted by the plan. If using this approach in a team, the technique of ‘everyone speaks once before someone speaks twice, seniors speak last’ can be a useful way to ensure a breadth of views are generated.
4. Review the list and identify the more critical issues that need to be explored further, especially given the time and resource constraints.

This approach, if used early in a problem-solving or planning process, can help to ensure that the external drivers that might not be considered, are factored into the planning process.

Part 2 summary

This part of the handbook has outlined ten challenges and biases that individuals or teams can face when working through the decision-making process. It also introduced red teaming techniques to mitigate these, which are summarised below.

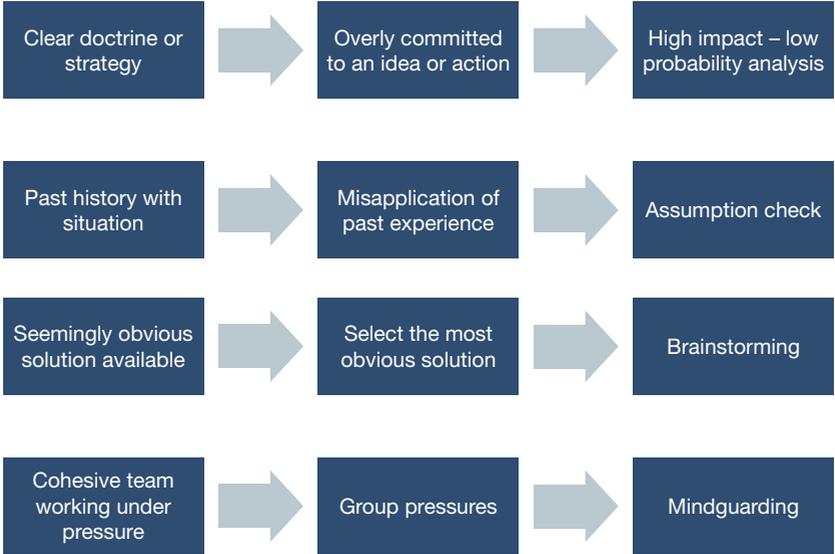
Information gathering



Sense-making



Decision-taking



Planning



Notes

“

The firmly inculcated doctrine that an admiral's opinion was more likely to be right than a captain's, and a captain's than a commander's, did not hold good when questions entirely novel in character, requiring keen and bold minds unhampered by long routine, were under debate.

”

Winston Churchill



Part 3

Red teaming

Part 3 of the handbook discusses red teams. This is the ‘traditional’ view of red teaming and involves the formal establishment and use of a separate group to act as the red team. The red team then engages in red teaming to examine an individual’s or group’s plan or decision. This part discusses how this capability can be developed and applied in different Defence contexts. It introduces more formal analytical techniques that can be used with more complex problems and when more time is available. This part of the handbook also discusses red cells and how these teams can support a range of planning and problem-solving tasks.

Chapter 7 – Red teams

Section 1 – Considerations

7.1. There are a number of advantages and disadvantages associated with using external red teams. The advantages of using an external red team are that they are:

- not invested in the plan and agnostic about its success or failure;

- able to be truly objective in analysis and not prejudiced by existing biases;
- not involved in the planning and decision-making and so can bring fresh perspectives to established problems; and
- potentially made up of members with expertise or knowledge that does not exist in the original planning team.

7.2. A number of disadvantages also exist. Red teams can be:

- resented and mistrusted by the original planning team;
- insensitive if not managed well;
- used selectively to do 'hatchet jobs' by an uninformed or unscrupulous end user;
- seen as not sufficiently expert or well placed to comment if members are not selected carefully;
- time-consuming to establish; and
- resource hungry, particularly in overstretched organisations.

7.3. An external red team is a very effective method of red teaming. However, the dynamic nature of modern, fast paced, resource-starved environments means that the practical considerations may make them difficult to use.

Section 2 – Process

Sponsor

7.4. The red team needs a sponsor to initiate the process. The sponsor needs to provide the initial tasking that essentially sets the 'exam question', outlines the scope for the work and, if necessary, the authority to carry out the task. The sponsor needs to be prepared to

accept and act on the red team's findings and not just pay lip service to it as an academic exercise. The sponsor also needs to foster an environment across the organisation that is open to, and accepting of, the challenge and criticism that the red team will create.

Composition

7.5. The red team should, ideally, be formed to tackle a particular project or plan rather than simply being a standing team that addresses a range of different tasks. Two types of individuals are suitable as members for the team.

- a. **Subject matter experts** on the topic being examined who are highly experienced and technically proficient. This allows the red team to examine the more 'technical' aspects of the plan.
- b. **Non-subject matter expert individuals** who are intelligent and good analytical thinkers but who do not know the topic area. These individuals bring fresh and novel perspectives to the analysis.

7.6. The size of the red team is vitally important. Size can vary anywhere between two and 20 individuals. Within this range, the optimum number is between four and eight – six is ideal. A red team with fewer than four members will begin to lack diversity and creativity in thought. Facilitation begins to become difficult and time-consuming with more than eight members; individual contribution levels begin to drop off with larger teams. Ultimately, there is no right or wrong answer or hard and fast rules when it comes to red team composition.

Red team leader

7.7. Like any team, a red team works best when it has a clear leader. The red team leader must work effectively both inside and outside of the team. Externally, the leader must have the credibility and social skills to interact effectively with the customers or sponsors of the red team product. There will often be sensitivities that need to be handled carefully as key members of the client organisation will be having their work examined. A lack of credibility will mean that the team's work could be easily dismissed by those antagonistic to the red team.

7.8. Internally, the red team leader needs to be a good facilitator and effectively enable the work of the group. The leader therefore needs to balance giving direction and guidance when required without being too prescriptive and stifling the creativity of the team.

7.9. The leader is responsible for ensuring that a range of different requirements and issues are addressed. These can include:

- developing and maintaining a good working relationship with the sponsor;
- providing advice and guidance to the sponsor about how to best to use the team;
- selecting the right members for the team;
- selecting the analytical techniques that are best suited to the task at hand;
- ensuring that the team have access to the information required to perform the task;
- where required, acting as a facilitator during group exercises; and
- reviewing the quality of the team's output.

The red team leader is also likely to be responsible for delivering the final product to the end user.

Qualities of a red team member

7.10. A good red team member requires a range of skills and personal qualities. These need to include:

- good analytical skills;
- critical thinking skills;
- good attention to detail;
- creativity and imagination;
- the ability to think flexibly;
- the ability to see the bigger picture;
- an openness to challenge;
- good communication skills; and
- the ability to work well in a team.

7.11. Some of these skills may be difficult to find in the same individual (attention to detail and ability to see the bigger picture, for example). In some cases, it may be necessary to find a blend of people who bring different skill sets to the team.

Reporting

7.12. The end product of a red team exercise can be a written report, a briefing to the sponsor or both. The findings from the red team analysis are also likely to be shared with the team that produced the plan or document in the first place. The key issue here is the sensitivities with which the sponsor or the original team will have about the findings. The red team output is likely to be critical of the work it has been analysing and so care should be taken to ensure that conclusions are fair, justifiable, non-personal, constructive and honest. Conversely, it is important that the red team does not shy away from telling the hard truths when they are required.

Section 3 – Principles

Guidelines for effective red teams

7.13. Good red teams tend to share a number of common characteristics. These qualities can be distilled down into a number of principles for good red teaming.

- Set a clear objective – the red team needs to know which question it is answering.
- Encourage a safe and open environment – red team members need a psychologically safe space within which to operate.
- Encourage challenge – the red team needs a culture of constructive challenge.
- Promote flexibility – red teaming techniques are not 'one size fits all' methodologies, they require refinement and adjustment to work in different situations.

- Be humble – red team members need to be sensitive to the concerns of end users.

It is also important to promote a sense of enjoyment within the team, red teaming can and ought to be fun.

Section 4 – Problem sets

7.14. Decision-makers face a range of issues, from simple problems that demand a rapid response to ‘larger scale’ challenges that involve greater complexities, more ambiguities and uncertainties, and play out over a longer timescale. In the first instance, the more straightforward problem sets can be addressed using the red team mindset techniques described in Part 2 of this handbook. These techniques can be used to help analyse more complex problems. For example, a number of the techniques described below involve generating ideas and possible solutions and, therefore, following the principles of effective brainstorming described earlier can help these processes.

7.15. In the second instance, the more complex problems can be addressed by a red team using red teaming techniques to structure and think about the problem. A selection of techniques are presented below within a simple, overarching framework to provide a guide for when they might best be used. This framework again uses the four phases of decision-making.

- Information gathering – defining the problem, examining evidence and identifying causes and implications.
- Sense-making – guarding against preconceptions that unduly influence interpretation of information or risk.
- Decision-taking – generating and examining possible solutions and exploring potential outcomes.
- Planning – critiquing the plan to ensure it is as effective and fit for purpose as it can be.



Chapter 8 – Information gathering

8.1. The first phase of the decision-making process is the information gathering stage. Problem issues can arise if a team overlooks something in the information search either because the group is directed to look in the wrong place or the search is too limited in some way. A red team can help to address some of these potential problems by using the techniques outlined below.

Quality of information check

8.2. A robust information search is critical to developing an effective plan or making a good decision. Errors made at this stage of the process will have implications at later phases. It is, therefore, vitally important that the information search is as good as it can be. A quality of information check can pay dividends in checking the accuracy and reliability of the information or evidence base used to build a case.

8.3. A good quality of information check will include a number of steps. These are detailed below.

1. List all sources and references used in the information search.
2. Check all sources in terms of accuracy of quotation.

- Has quoted information been taken out of context, used selectively, or has it been reported faithfully?
- 3. Check all references for credibility.
 - Do the references come from reputable organisations and/or publications?
- 4. Check the range of sources and references.
 - Is the range of sources/references sufficiently wide or is it drawn from a limited number?
 - Are the sources/references of the same type?
- 5. Check the reliability of the evidence.
 - Do the sources have any indications of bias?
 - Are there any indications of misinformation, has the source been fact checked?
- 6. Check the validity of the evidence.
 - Does the quantity of the evidence presented support the conclusions drawn from it?
- 7. Check the clarity with which information has been used.
 - Has ambiguous information been interpreted and caveated properly?

8.4. It would be very useful for those conducting the review to have some knowledge or understanding of the body of information they are assessing. This is especially the case with confirming the credibility of the sources and references used. It is possible to conduct the review without this expertise, however, some background research is advisable.

8.5. The work of the reviewers would also be facilitated by using some kind of database where the information is stored by reference or source. This enables easy access to the information and, if required, facilitate searches for specific pieces of information.

8.6. A well-conducted quality of information check can either confirm or challenge the quality of the evidence base that has been used to develop a plan, support an argument or line of reasoning. As such, it can help to spot errors and information gaps as well as instil confidence that the ideas proposed are built on a robust footing.

Assumptions review

8.7. Assumptions review is similar to the assumptions check technique but involves a more thorough analysis of the assumptions. The technique involves a number of steps that are detailed below.

1. Identify an existing estimate that describes the situation or plan for dealing with the problem. Alternatively, write out a description of the problem or situation including the current situation (present), causal factors (past) and possible outcomes of solutions (future).
2. Analyse the description and highlight explicit assumptions; these are statements where an assumption is clearly stated by the author.
3. Analyse the description and highlight assumptions that have not been explicitly stated; as with a red team mindset assumptions check, phrases such as 'typically', 'generally', 'experience has shown' and 'would have to be' indicate these implicit assumptions.
4. For each assumption, ask the following questions.
 - o What is the confidence level in this assumption?
 - o What evidence supports this level of confidence?
 - o Could it have been true in the past but not in this instance?
 - o Is it time sensitive?
 - o Under what circumstances might it be invalid, and could this happen?

- o What is the impact if it is invalid?
- o What adjustments need to be made to the plan if the assumption is wrong?
- o Are there any new issues that need to be considered?

5. Finally, the last step of the process is to rate each assumption as 'supported', 'caveated' or 'unsupported'.

8.8. Supported assumptions are those assertions that have proven to be valid and are therefore not of particular concern. Caveated assumptions need to be explored further or monitored based on the nature of the caveats. Unsupported assumptions need to be re-examined thoroughly and adjustments made to the plan or decision to mitigate the impact of these unfounded assertions. Reviewing and challenging assumptions in this manner can ensure that assertions based on past experience are valid and applicable to current problems.

Stakeholder mapping

8.9. Stakeholder mapping is a very useful tool for moving away from the information and argument that supports the plan or decision and instead focuses on the wider implications of the proposition. A key aspect, which is often forgotten or not given sufficient consideration, is the stakeholders who will have an impact on, and/or may be impacted by, the plan. It is, therefore, very useful to consider the situation that is being addressed by the plan or decision from the perspective of the various stakeholders involved. Stakeholder mapping involves a number of key steps.

1. Brainstorm a (long) list of key stakeholders who can either have an impact on the outcome of the decision or plan or who might be impacted by it.
2. For each stakeholder, assess the extent to which they are likely to be supportive or in opposition using the scale shown in Figure 8.1.

Stakeholder	Strong support	Weak support	Neutral	Weak opposition	Strong opposition

Figure 8.1 – Stakeholder analysis table

3. Step 2 should produce a long list of stakeholders, possibly 20 or 30, or more. This list is useful to highlight the range of stakeholders but is likely to be too long to be manageable and so it needs to be narrowed down. This can be done by using a quadrant crunch (a template is shown in Figure 8.2). This involves plotting each stakeholder on two axes. The first axis is the level of support that the stakeholder is assessed as having for the issue as identified in step 2. The second axis is the importance of the stakeholder – this can be defined as its power to affect the outcome, to help or to hinder the plan or decision.

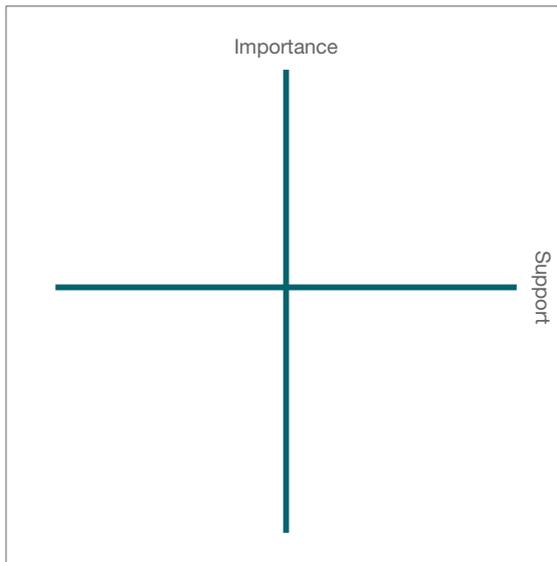


Figure 8.2 – Quadrant crunch template

4. Several analyses can be conducted using this plot.
 - o Stakeholders plotted bottom left (low importance and low support) are not critical to the outcome of the plan or decision.
 - o Stakeholders plotted bottom right (low importance but high support) are interesting but are probably not priorities due to their low importance.
 - o Stakeholders plotted top left are of interest as they are potential blockers due to high importance but low support. Thought can be given as to how to move these stakeholders to the right by making them more supportive. Step 6 can help with this analysis.
 - o Stakeholders plotted top right are also of interest because they are potential champions due to their high importance and high support. Consideration should be given as to how best to enlist their active help. Again, step 6 can support this analysis.
5. Create a shortlist by identifying the critical stakeholders; these are the actors who have high importance and are most relevant given the context of the situation (either blockers or champions).
6. For each critical stakeholder, conduct a 'four ways of seeing' analysis. This takes the decision-maker's or planner's organisation or team and compares the way that the:
 - o home team or organisation views itself;
 - o stakeholder views itself;
 - o home team or organisation views the stakeholder; and
 - o stakeholder views the home team or organisation.

8.10. It is useful to include consideration of the home team/organisation's and the stakeholder's view on the issue in question. This is a useful analysis for identifying areas of agreement and points upon which the

team or organisation and the stakeholder differ in perspective. The chart shown in Figure 8.3 is a useful way to record the key points.

How X views X	How Y views Y
How X views Y	How Y views X

Figure 8.3 – Four ways of seeing analysis template

8.11. This analysis forms a useful basis for planning action to either enlist the support of the championing stakeholders or persuade the blocking actors to support the plan. This can be made more concrete by completing the final step in the process and conducting a ‘get-to-by’ analysis. This analysis takes the following line of thinking.

- Get – the critical stakeholder.
- To – mitigate a concern (for the blocker) identified in the analysis or support an enabling consideration (for a champion).

- By – a concrete action that can be taken by the home team or organisation.

This can be easily represented using a simple table shown in Figure 8.4.

Get	To	By

Figure 8.4 – Get-to-by table template

8.12. The whole stakeholder mapping process can be very useful in lifting an individual’s or team’s thinking outside of the internal considerations and looking at the broader picture. This is achieved by identifying key stakeholders and thinking about how to engage with them in a proactive manner to either win them over or encourage them to act as champions for the cause.

1. Identify the key recommendations or conclusions stated in the plan or proposition.
2. Identify the argument supporting each recommendation or conclusion.
3. Breakdown the argument into the following components:
 - o assumption – a point or piece of evidence that is accepted as true without necessarily having supporting proof;
 - o assertion – a statement based on fact;
 - o deduction – inference drawn from the information, especially the assumptions and assertions; and
 - o conclusion – the proposition reached from the stated deductions.
4. The process is helped by writing each recommendation/ conclusion, assumption, assertion, deduction and conclusion on a separate piece of paper or sticky note. Alternatively, a virtual whiteboard can be used to do this.
5. Arrange the slips of paper or sticky notes on a table, board or (virtual) wall. The idea is to create a flow diagram of how assertions and assumptions link to deductions and how these link to conclusions. This process is facilitated by working backwards from the final, main conclusion.
6. Identify the final or primary conclusion or conclusions.
7. Identify the deductions or conclusions that are used in immediate support for the primary conclusion, these are supporting deductions/conclusions.
8. For each supporting deduction or conclusion identify the deductions (or conclusions) that are used to generate it – these are formative deductions/conclusions (there may not be any). At the same time, identify the assumptions or assertions that are used to develop the formative deduction or conclusion.

9. Note any points that do not link to or fit with the others, these are the 'orphans' and are redundant issues or are issues that need to be reconsidered.
10. Keep working backwards until the chain of reasoning has been exhausted.
11. Examine each point or node in the argument and identify where the logic is flawed, specifically in terms of where:
 - o assumptions are unfounded;
 - o assertions are misinterpretations of the evidence;
 - o deductions are not supported by evidence, based on untested assumptions or faulty assertions;
 - o conclusions do not flow logically from the deductions; and
 - o 'orphaned' points are left unaddressed.

It is helpful to mark these problem areas in red on the flow diagram, as shown in Figure 9.1.

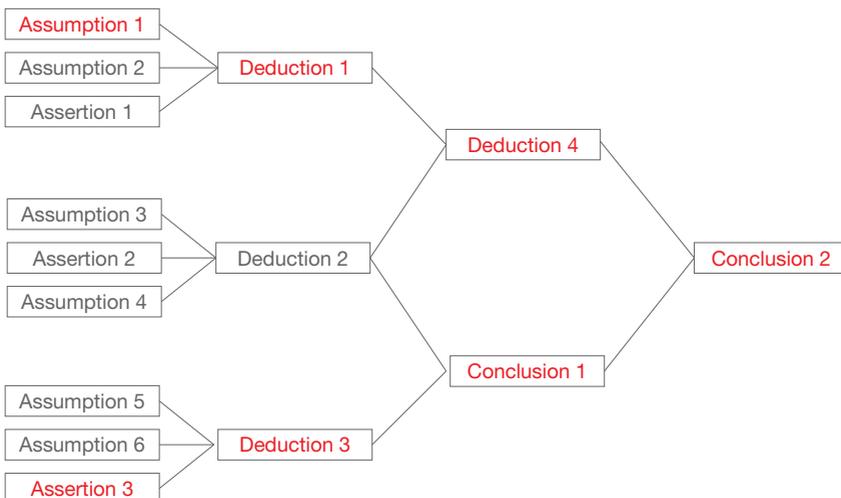


Figure 9.1 – Argument mapping flow chart example

12. Working from the beginning, from left to right, identify the impact of the logical flaws on the line of reasoning. These are the problem areas that need to be addressed and should also be marked in red.

13. Identify what information is required to fill the knowledge gaps and what flaws need to be addressed.

9.4. The physical act of mapping the logic of an argument makes any information gaps or logical inconsistencies more readily apparent. Also, points in the logic where intuitive and unfounded leaps have been made can be more readily identified.

Analysis of competing hypotheses

9.5. The analysis of competing hypothesis technique is a useful tool for examining a problem where there are several hypotheses that explain a situation in terms of what has happened to cause the event, what the scenario actually is and how it may unfold in the future. The process involves taking each hypothesis and analysing information that is either inconsistent or consistent with it and rejecting hypotheses that do not hold water. It is a useful method for challenging different viewpoints or interpretations and establishing which ones are robust and valid.

9.6. The process for this technique follows a series of analytical steps. These are detailed below.

1. Analyse the situation or documentation and either identify, where these exist, the extant hypotheses or develop a set of hypotheses to work with. The hypotheses should be mutually exclusive: if one hypothesis is true, the others must be false. Generate as wide a range of hypotheses as is practical and desired.

2. Write a very short description or title for each hypothesis, this will help later steps.

3. Generate a list of critical or significant pieces of information that relate to the hypotheses, these are the significant points of evidence and arguments. This information should include:

- o evidence;
- o absence of evidence (the lack of something if the hypothesis was true); and
- o assumptions (used by the decision-makers or planners).

4. Create a table or matrix with the hypotheses as the column headings and the relevant information points as the row headings. An example is shown in Figure 9.2.

	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 4
Criteria 1				
Criteria 2				
Criteria 3				
Criteria 4				
Criteria 5				
Criteria 6				
Criteria 7				
Criteria 8				

Figure 9.2 – Analysis of competing hypotheses matrix template

5. Analyse each information criteria in terms of whether it is:
- o consistent with the hypothesis;
 - o inconsistent with the hypothesis; or
 - o not applicable or not relevant to the hypothesis.

6. Complete the matrix by putting a tick in the appropriate cell if the information is consistent or a cross if it is inconsistent with the hypothesis in question. 'N/A' can be used if it is not applicable or irrelevant. A double tick or cross can be used if the information is particularly supportive or undermining.
 7. Comments such as 'it all depends on' made when assessing consistency means that this evaluation is based on an assumption. These assumptions should be noted and analysed to see if there are any patterns that should affect the confidence placed in the assumptions and thus the ratings.
 8. Assess the relative likelihood of each hypothesis being valid based on the amount of inconsistent information. If required, sort the hypotheses from those that have the least inconsistencies to the most. The hypotheses towards the top of this list are the ones that are most likely to be valid.
 9. Report the outcomes for all of the hypotheses, including the weaker ones (those with more inconsistencies). The report should include a brief summation of the evaluation and reference the key inconsistencies.
 10. Consider which items of information were most diagnostic in terms of validity of hypotheses.
 11. Assess the sensitivity of the conclusions drawn by considering the impact if that information criterion was wrong or changed, or whether the assumption upon which it was based was not valid.
- 9.7. The analysis of competing hypotheses technique can help individuals or teams make better decisions by forcing them to reconsider their thinking on the issue at hand. Evaluating different hypotheses can help decision-makers to examine other possibilities and not just settle for a readily available answer that seems to fit the situation. It can also force decision-makers to not rely on evidence that supports a preferred hypothesis, but which is also consistent with other alternatives.



Chapter 10 – Decision-taking

10.1. The third phase of the decision-making process is concerned with how a group reaches a conclusion or judgement. Problems can arise if the group uses inappropriate analogies to aid problem solving or is not sufficiently flexible in its thinking and so draws the wrong conclusions. An external red team can help the decision-taking phase by using the following techniques.

Cone of plausibility

10.2. The cone of plausibility exercise, as shown in Figure 10.1, is designed to create different scenarios of how a situation might unfold. It can, therefore, be used to create alternative perspectives. The basic idea is to use an understanding of the different factors (drawn from the political, economic, social, technological, legal and environmental (PESTLE) framework) that might shape how a situation develops over time. The aim is to generate up to six (although typically four) different scenarios. The different scenarios are:

- mainline scenario – how the situation will most likely unfold;
- good case scenario – how the situation will unfold if the drivers develop in a reasonably positive manner;

- best case scenario – the optimal outcome where all or most of the factors develop positively (may not be used);
- bad case scenario – how the situation will unfold if the drivers develop in a reasonably negative manner;
- worst case scenario – the least preferred outcome where all or most of the factors develop in a negative fashion (may not be used); and
- wildcard scenario – how the situation might unfold if an unlikely (high impact – low probability, black swan) event occurs.

Contextual drivers

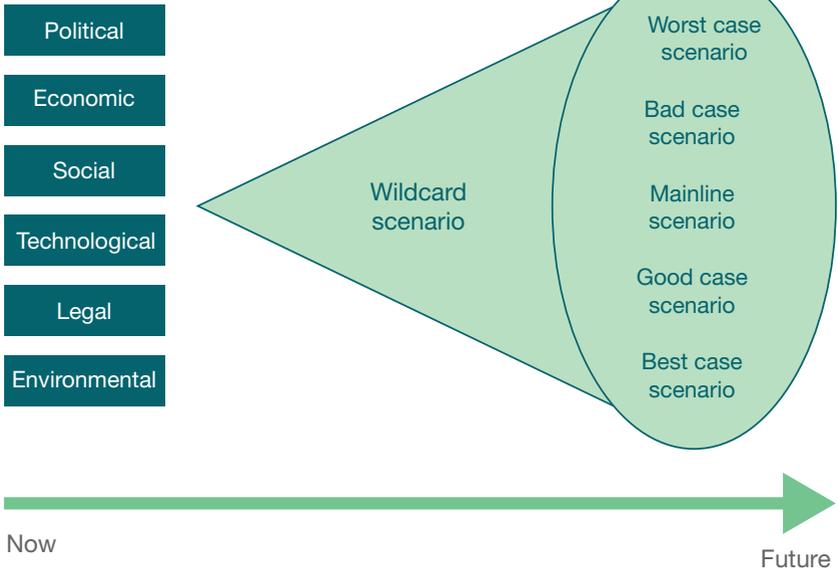


Figure 10.1 – Cone of plausibility

10.3. These different scenarios can then form the basis for planning. The exercise follows a number of steps.

1. Define the problem – clearly state the problem to be considered with as much specificity as possible. Ideally, a timescale should be attached to the problem statement.
2. Brainstorm a list of factors that could shape how the problem situation might develop over the given timescale. These possible drivers should be drawn from the different PESTLE categories and stated in neutral terms such as ‘unemployment rate’ and not ‘high unemployment’. A simple table, as shown in Figure 10.2, is useful for doing this.

Factor	Possible drivers
Political	
Economic	
Social	
Technological	
Legal	
Environmental	

Figure 10.2 – Table of factors and possible drivers template

3. The next stage is to develop the different scenarios. Start with the mainline or most likely scenario. Select the four to six drivers that are most likely to shape the way the situation will develop. It is best to choose a driver from each PESTLE factor if possible, to ensure breadth of coverage, but this is not a hard and fast rule; driver selection should be dictated by the requirements of the situation.

4. Once the drivers have been selected, the next step is to describe how each driver will unfold within the context of the type of scenario – these are the assumptions in Figure 10.3. This should be a one sentence description of how that driver will develop over the set time frame.

Factor	Driver	Assumption	Impact
<p>Title:</p> <p>Overview:</p> <p>Challenge:</p>			

Figure 10.3 – Scenario analysis template

5. The next step is to take each assumption and define the impact the development will have on the problem situation. This should again be a brief, one sentence description.

6. The next step is to synthesise the different impacts into one holistic overall description of how the situation will develop. This overview should incorporate all of the impacts; it can be useful to partly develop the overview in a chronological order where each impact affects others in a sequence.

7. Based on this overview, it is possible to develop a ‘challenge’ or objective. The nature of the challenge or objective will depend on the context of the problem situation.

8. The final step in the process, if required, is to develop a title for the scenario. This sounds trivial, but the title rapidly becomes the shorthand by which the scenario becomes known. Therefore, it is useful to give the scenario a good title.

10.4. Other scenarios can then be developed by repeating steps 3 to 8 above. In each instance the assumptions (the way in which the driver develops) are changed to reflect the type of scenario.

- **Good case** – change roughly half of the assumptions to be positive in tone; these should be the drivers that are most likely to develop in a positive manner.
- **Best case** – change all or most of the assumptions to be positive in tone.
- **Bad case** – change roughly half of the assumptions to be negative in tone; these should be the drivers that are most likely to develop in a negative manner.
- **Worst case** – change all or most of the assumptions to be negative in tone.
- **Wildcard** – change one or possibly two of the drivers to reflect a high impact – low probability event. In this instance, a new driver could be introduced to reflect this black swan event.

10.5. It is best to use the same drivers for each scenario and change the assumptions if possible; it is possible to use different drivers if this makes sense. For each scenario, the impact linked to the changed assumption will be different as will the overview and hence the challenge; this is essentially the key reason for conducting the exercise.

10.6. The cone of plausibility exercise provides a very useful process for decision-makers to think about how a situation might unfold in the future and the outcomes from the exercise can thus help facilitate contingency planning. Examining the 'workings' of the different scenarios, the drivers, assumptions and impacts can also help an individual's or team's

understanding of the situation. A final benefit is that the assumptions and impacts can be developed into indicators that can be monitored to determine which scenario is actually becoming a reality.

Alternative futures analysis

10.7. Alternative futures analysis is another effective technique for exploring the different ways in which a situation can develop. It is best used in situations that are complex and involve a high degree of uncertainty. It therefore differs from the cone of plausibility approach, which works better with less ambiguity about the driving factors that will shape the outcome of the situation. As with the cone of plausibility approach, this technique produces multiple possible outcomes. Similar to other red teaming techniques, alternative future analysis involves a number of clear steps.

1. Define the issue that needs to be addressed. This issue is typically what the future state of a situation will look like. A good example would be 'what will the future of country X look like in ten years' time?'
2. Brainstorm a list of factors that could affect the issue in question. This is best done at this stage in an unstructured manner, however, the 'everyone speaks once before someone speaks twice, seniors speak last' approach is very useful here.
3. It can be helpful, although it is not essential in this case, to reconsider the list of factors under the PESTLE framework as this often serves to prompt further ideas.
4. Select the two most critical factors from this long list. Anonymous voting is a good method for ensuring that this process is not too affected by having different levels of expertise or authority in the room.
5. Each factor should then be turned into a continuum or bipolar axis, by defining a condition at either end of the spectrum. For example, the political nature of a state could be defined as

‘unified’ or ‘federalised’, or the type of society could be defined as ‘religious’ or ‘secular’.

6. Combine these two axes to form a quadrant, as shown in Figure 10.4.

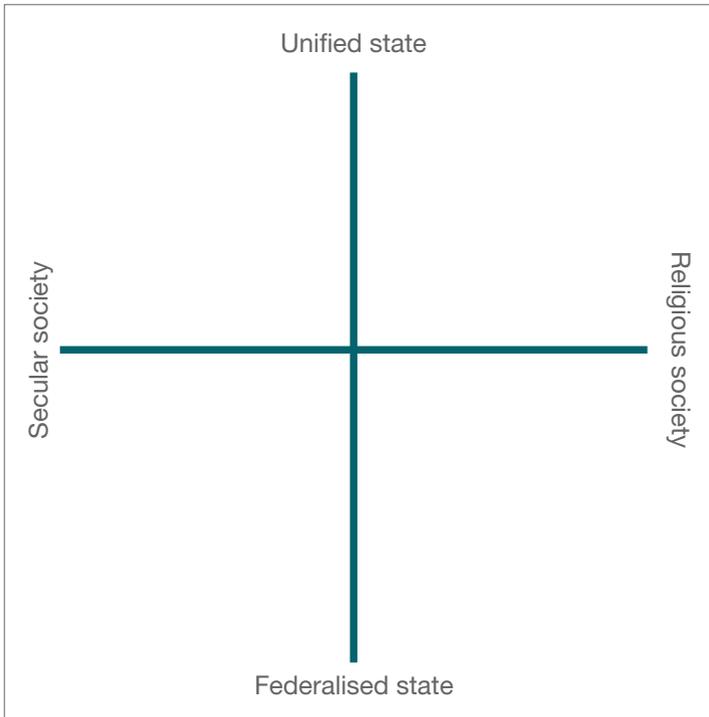


Figure 10.4 – Alternative futures analysis template

7. The combination of the two axes forms four quadrants, where each quadrant represents a different possible scenario. In this example:

- o scenario 1 is a unified state with a secularised society;
- o scenario 2 is a unified state with a religious society;
- o scenario 3 is a federalised state with a secularised society; and
- o scenario 4 is a federalised state with a religious society.

8. Develop a description for each scenario which outlines what that future situation looks like, how it came about from the present and the likely impact on other areas or issues that are associated with it. These descriptions can then be used for planning purposes or to help resolve the issue for which the analysis was conducted.
9. The analysis can be used to develop signposts that the scenarios might be unfolding by taking the description of how the scenario came about in step 8 and turning these into indicators of change.
10. More detailed scenarios can be developed by breaking down the scenarios further by creating quadrants that sit within the existing quadrants. For example, the federalised state could be further divided into 'large' or 'small' and a religious state could be divided into 'fundamentalist' and 'tolerant'. This produces four sub-scenarios within one overall scenario. This is shown in Figure 10.5.

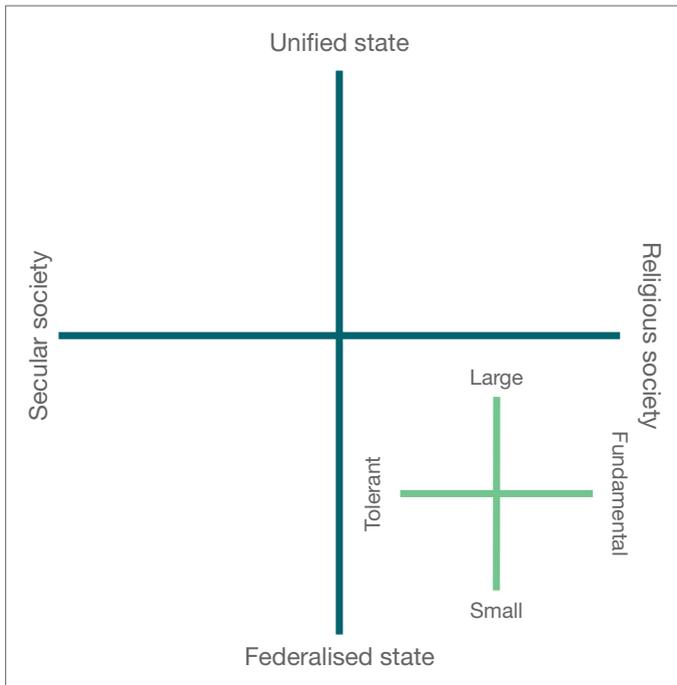


Figure 10.5 – Alternative futures analysis sub-scenario example

11. More main scenarios can be developed by creating other combinations of factors such as 'strengths of armed forces' and 'state of economy'. This process can be repeated as often as required and for as long as there are different factors that can be combined.

10.8. Alternative futures analysis can take a complex and uncertain future and develop multiple possible future scenarios. These scenarios can then be used for various decision-taking or planning purposes.



Chapter 11 – Planning

11.1. The fourth phase of the decision-making process involves checking that the analysis and planning outcomes are robust and fit for purpose. Problems can arise at this stage if the group fails to think things through in sufficient detail or consider critical factors that might affect the plan. A formally constituted red team can mitigate these issues using the techniques outlined below.

Section 1 – Pre-mortem analysis

11.2. Pre-mortem analysis is a red teaming technique that is very effective at identifying any potential problems and points of failure in a plan. The basic concept is like a post-mortem but whereas this procedure is conducted after death has occurred to identify the causes, a pre-mortem is conducted beforehand to identify potentially fatal causes and therefore prevent ‘death’ or failure of the plan. The technique involves the following steps.

1. Assume that the plan has failed spectacularly (death).
2. Define what ‘death’ or failure looks like (for example, the project is cancelled by a higher authority).

3. Next, define the immediate cause or causes of failure. These should be the factors that actually cause the failure and so should occur just before the problem in any sequence of events. Between two and six causes or factors is a good number, but there is no limit.
4. For each cause of death or point of failure create a causal chain of events or issues which would lead to that final stage or cause of failure occurring. To do this, take each final stage or cause of death and define which event or issue would immediately cause this condition, then identify which event or issue would have caused that circumstance. Keep repeating the process to work backwards, defining successive steps in the causal chain.
5. Stop when an action or decision point in the plan is reached. This is a root cause of failure, the starting point that is under the decision-maker's control that might ultimately lead to project failure.
6. Repeat the process for each cause of death or immediate cause of failure.
7. Identify what actions can then be taken to mitigate or address this problem, such as changing the plan or direction of the decision.

Section 2 – Red cells

11.3. Another external factor that can be neglected in a planning or decision-making process is one particular stakeholder: the adversary. Insufficient consideration given to the interests, plans and reactions of the adversary can lead to the failure of a plan.

11.4. It can be very useful for an individual or team to adopt the perspective or mindset of the adversary and consider the impact of this on a plan or decision. Acting as a red cell and adopting the adversary perspective can have several functions. It can:

- develop adversary estimates and plans to forecast future actions;

- provide insight into how the adversary may react to friendly force actions; and
- role play the adversary in wargaming.

11.5. Using a red cell to engage in adversary perspective thinking can provide multiple benefits to a decision-maker. First, it can help to prevent mirroring. This is a cognitive bias where the individual projects their own thinking on to another person or group. The assumption is that the adversary 'thinks like we do'. This can clearly cause problems if plans are developed based on this potentially false premise.

11.6. Secondly, an understanding of how the enemy views friendly forces can help decision-makers understand how the adversary believes friendly forces will act. This understanding can help decision-makers consider the likely actions of the adversary.

The Japanese military authorities believed that the United States (US) would accept the attack on its Pacific fleet at Pearl Harbour and quickly agree to a negotiated settlement rather than entering into a prolonged war, fighting until total defeat of Japan was achieved. Understanding this mindset would have allowed US decision-makers to realise that an attack on the US was more likely than their intelligence estimates suggested. 

11.7. Red cell inspired adversary perspective thinking can also support the development of strategic and operational planning by developing a set of adversary plans. This can provide warning of future challenges or conflicts by alerting decision-makers to the adversary's potential areas of interest or concern and so support contingency planning to deal with these potential threats. This process can be conducted at the strategic level in terms of identifying long-term threats as well as at the operational level by identifying specific areas of concern.

11.8. Another benefit is that a team, based on an understanding of the adversary, can play an 'intelligent enemy' in wargaming exercises. A well-informed and culturally sensitive team playing the adversary can develop plans and react to friendly force actions in a way that realistically

replicates the enemy and so can facilitate more effective wargaming exercises.

US decision-makers were well aware, through intelligence reports, that the Japanese government and military authorities viewed an attack on the US as risky. They were also aware that the Japanese authorities were very doubtful that they could win a long war because of the American dominance in production capacity.



American logic assumed that the Japanese would, therefore, not risk attacking the US. The Japanese viewed the risks differently and so acted in a manner contrary to US expectations, eventually attacking the Pacific fleet in Pearl Harbour on 7 December 1941.

11.9. A red cell will work most effectively when it is composed of a small team. Ideally, the team needs to operate separately to the friendly force intelligence and decision-making apparatus so that it does not hold privileged information about home team intentions. This separation can be best achieved by assigning individuals to the team as their only responsibility and even physically placing the team in a separate location.

11.10. It is critically important that members of the red cell have subject matter expertise about the adversary. Areas of expertise can be grouped under the PESTLE categories.

- a. **Political.** A clear understanding of the adversary's intentions and the political processes or constraints within which its decision-makers operate.
- b. **Economic.** An understanding of the adversary's economic strengths and weaknesses and how these impact on its intentions and capabilities.
- c. **Social.** A culturally nuanced understanding of the shared values and national psyche of the adversary.

- d. **Technological (military).** An in depth appreciation of the capabilities and competence of the adversary's armed forces across the spectrum of kinetic and non-kinetic operations.
- e. **Legal.** A robust appreciation of the legal, and to some extent ethical or moral, constraints within which the adversary operates.
- f. **Environmental.** An appreciation of the physical constraints or advantages that the adversary operates within.

11.11. A clear understanding of these factors will help the team to faithfully reflect and represent the adversary. This understanding can be further worked up into an assessment that can be used to guide thinking on specific questions posed to the red cell.

Analytical framework

11.12. A useful analytical framework that can be used to support adversary perspective thinking is to consider the enemy at different levels. The first level is behaviour.

11.13. An adversary team is essentially focused on either predicting or replicating the enemy's likely behaviour in different contexts, and either generating future plans or analysing how the enemy would respond to friendly force actions. Behaviour is shaped by the attitude or stance that a person or group holds towards a certain issue. A red cell, when considering how an adversary will behave or react in any given situation, needs, therefore, to first identify the attitudinal stance it holds towards the situation.

11.14. A deeper understanding of this attitudinal stance can be developed by considering the different drivers that shape attitudes. This level of understanding is what really drives effective red cell work and adversary perspective thinking as it provides a solid foundation for determining the adversary's mindset and, thus, its behaviour. There are four broad factors to consider at this level: conditions, beliefs, motives and values.

Conditions

11.15. Conditions refer to the environmental factors that either constrain or enable the adversary's thinking and actions. This understanding can be drawn from an appreciation of the PESTLE aspects in an adversary analysis. The other three factors are drawn from the social section of the adversary analysis.

Beliefs

11.16. Beliefs are the specific views held by the adversary. These views may or may not be supported by any evidence or truth. These beliefs can be specific views held about a particular subject or a broader set of beliefs such as a political philosophy or a religious code.

Motives

11.17. Motivational drivers both energise and direct the behaviour of adversary leaders. For example, is the adversary motivated by a sense of power and seeks to achieve dominance over others or alternatively by a sense of altruism and is therefore more likely to focus on peaceful resolutions? Motives can include a range of different drivers, such as:

- achievement – attaining functional goals;
- acquisition – obtaining money or goods;
- affiliation – focusing on relationships;
- aggression – opposing and combative;
- autonomy – desire for independence;
- deference – seeking guidance;
- dominance – wanting influence and control;
- recognition – needing power and status;
- security – focusing on safety; and
- sustenance – focusing on basic needs.

11.18. These needs can be fitted into Maslow's hierarchy of motivational drivers to aid analysis.²³ This is shown in Figure 11.1. Effective red cell

23 Abraham Maslow, 'A Theory of Human Motivation', *Psychological Review*, Volume 50, 1943, pages 370–396.

thinking will identify which motivational driver is most prominent for the adversary in terms of shaping its attitude towards the issue.

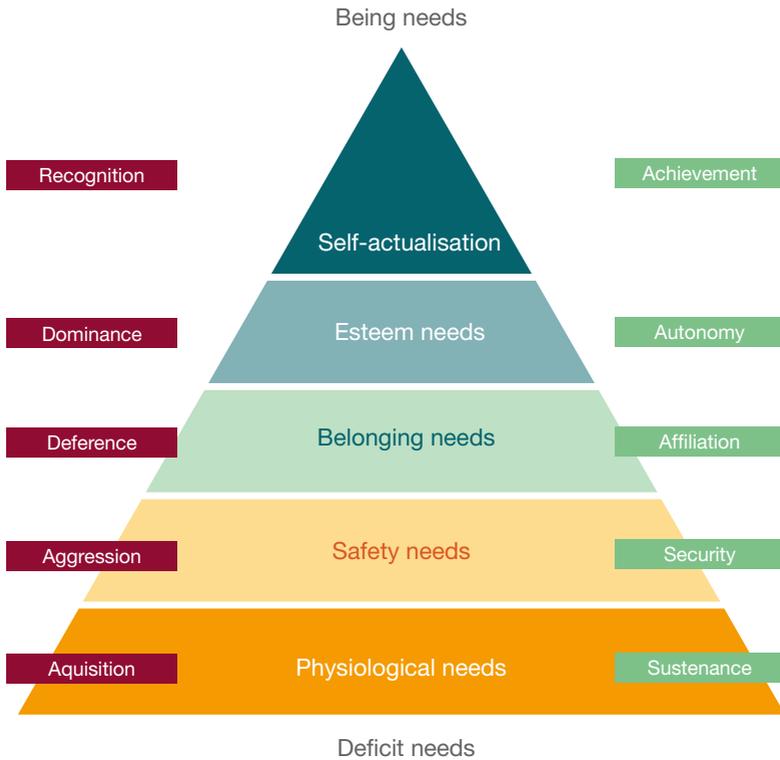


Figure 11.1 – Maslow’s hierarchy of motivational drivers

Values

11.19. Values are the culturally defined ways that the adversary uses to make sense of the world and guide its thinking and actions. These values can be viewed at the group or even national level. Geert Hofstede’s cultural dimensions provides a useful framework for this and are listed as follows.²⁴

.....
 24 Geert Hofstede, *Culture’s Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*, 2001.

- Power distance – the respect for hierarchy and distribution of power within a country; how decisions are made.
- Individualism – whether the sense of identity is focused on the individual or a collective group; where decisions are made.
- Masculinity – whether success is achieved through force or compromise.
- Uncertainty avoidance – need and respect for rules, intolerance of ambiguity and uncertainty; tendency to see issues in black and white terms.
- Long-term orientation – whether focus is on long-term goals or short-term gains.
- Indulgence – level of restraint shown in society.

11.20. These factors all combine in different ways to shape the adversary's attitude and, in turn, their behaviour in any given context. Figure 11.2 visualises this.

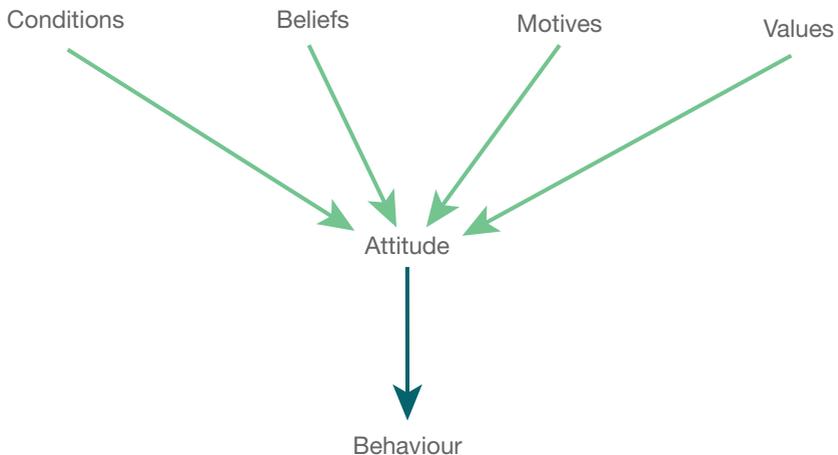


Figure 11.2 – Shaping the adversary's attitude and behaviour

11.21. Red cell thinking needs to consider all of these factors to form a nuanced and robust analysis of the enemy. A useful analytical tool for conducting an appreciation of the adversary regarding a specific question about how it will behave is a force field analysis.

11.22. A force field analysis starts with the attitudinal stance that the adversary is most likely to hold towards the issue. It then examines the different factors (conditions, beliefs, motives and values) that will shape the attitude in terms of the positive factors that will support the mindset (enablers) and those that will constrain it (resistors). Specific aspects of the four factors are plotted on the force field analysis. The main benefit of using this approach is that it enables the analytical process by plotting all the relevant factors on one page for easy reference. This is shown in Figure 11.3.

Enablers		Attitude	Resistors	
Conditions				Conditions
Beliefs			Beliefs	
Motives			Motives	
Values			Values	

Figure 11.3 – Force field analysis template

11.23. It is beyond the scope of this handbook to go into more detail about the adversary assessment factors described above. Red cell thinking can be a highly effective aspect of red teaming. Looking at a situation from the perspective of the adversary can help to identify and mitigate external factors that might affect a plan or implementation of a decision. A red cell analysis is best conducted as a team activity.

Annex A

Selected worked red team examples

A.1. This annex presents worked examples of two of the more complex red teaming analysis techniques: cone of plausibility exercise and an analysis of competing hypotheses. These examples are based on a fictitious country called 'Fantasia' and should help to provide greater understanding of how to work through the different techniques.

Example 1 – Cone of plausibility

How stable will Fantasia be in 12 months' time?

Factor	Possible drivers
Political	Progress of peace talks. Stability of national government.
Economic	Unemployment rate. Level of oil exports. Inward investment levels.
Social	Sectarian tensions.
Technological	N/A.
Legal	N/A.
Environmental	Severity of summer drought.

Mainline scenario

Factor	Driver	Assumption	Impact
Political	Process of peace talks.	Peace talks continue to stall.	Continuing frustration in south at lack of progress.
Political	Stability of government.	Government challenged but remains in power.	Government unable to introduce reforms.
Economic	Unemployment rate.	Unemployment increases markedly in the south.	Further disaffection with government in the south.
Economic	Level of oil exports.	Gradual increase in oil exports.	Modest rise in government revenues.
Economic	Inward investment.	Slow increase in foreign investment.	Slow improvement in redevelopment in the north.
Social	Sectarian tensions.	Heightened but stable tensions.	Increase in violent clashes between the north and the south.

Title: Fantasia fragile

Overview: Modest increases in oil exports and foreign investment leads to a slowly improving economic situation for Fantasia. The impact of this is felt mainly in the north, fuelling disaffection in the south. This disaffection is heightened by a continuing rise in unemployment, a frustration with the lack of progress in peace talks and the government's inability to introduce reforms. Disaffection leads to increased violence between northern and southern sects; this violence hampers redevelopment efforts in the south and restricts economic growth.

Challenge: Reduce sectarian tensions to facilitate future stability and growth.

Good case scenario

Factor	Driver	Assumption	Impact
Political	Process of peace talks.	Substantial progress in peace talks.	Sense of optimism in the south.
Political	Stability of government.	Government challenged but remains in power.	Government unable to introduce reforms.
Economic	Unemployment rate.	Unemployment increases markedly in the south.	Further disaffection with government in the south.
Economic	Level of oil exports.	Gradual increase in oil exports.	Modest rise in government revenues.
Economic	Inward investment.	Clear increase in foreign investment.	Improvement in redevelopment in the south.
Social	Sectarian tensions.	Reduction in tensions.	Decrease in violent clashes between the north and south.

Title: Fantasia forwards

Overview: Substantial progress in peace talks leads to a general sense of optimism and reduced disaffection in the country as a whole and particularly in the south. An increased sense of optimism leads to a marked decrease in violence in the country. A stable situation leads to greater foreign investment which, combined with slowly increasing oil revenues, funds greater redevelopment in the south. Continuing instability in the government and lack of short-term improvement in unemployment in the south means this improvement is limited and fragile.

Challenge: Encourage further investment in southern redevelopment to facilitate future stability and growth.

Bad case scenario

Factor	Driver	Assumption	Impact
Political	Process of peace talks.	Peace talks continue to stall.	Continuing frustration in south at lack of progress.
Political	Stability of government.	Government challenged but remains in power.	Government unable to introduce reforms.
Economic	Unemployment rate.	Mass unemployment in the south.	Heightened disaffection with government in the south.
Economic	Level of oil exports.	Gradual increase in oil exports.	Modest rise in government revenues.
Economic	Inward investment.	Marked increase in investment.	Armed conflict between militias in the south.
Environmental	Severity of summer drought.	Severe drought in the south leading to famine.	Heightened disaffection in the south.

Title: Fantasia falters

Overview: Severe drought in the south of Fantasia produces widespread crop failure and a subsequent famine, leading to a humanitarian crisis. Lack of support from an ineffective government and a stalled peace process serves to heighten the disaffection in the south leading to armed conflict between rival militia groups. The state of conflict means the little industry that exists in the south fails, creating high unemployment and further disaffection.

Challenge: Intervention to restore peace in southern Fantasia to facilitate immediate delivery of humanitarian aid.

Wildcard scenario

Factor	Driver	Assumption	Impact
Political	Process of peace talks.	Peace talks successfully concluded.	Marked increase in optimism.
Political	Stability of government.	Government falls in Fantasian 'spring revolt'.	Liberal people's government seeks peace.
Economic	Unemployment rate.	Unemployment increases markedly in the south.	Further disaffection with government in the south.
Economic	Level of oil exports.	Gradual increase in oil exports.	Modest rise in government revenues.
Economic	Inward investment.	Slow increase in foreign investment.	Slow improvement in redevelopment in the north.
Social	Sectarian tensions.	Stable relations.	Cessation of violence between the north and south.

Title: Fantasia flies

Overview: Popular uprising in an adjacent country spills over into Fantasia leading to a popular uprising known as 'The Fantasian Spring'. The current government is toppled and replaced by a highly liberal 'people's' government whose main objective is to seek peace and reconciliation. This focus leads to a swift and successful conclusion of the peace talks and an end to the violent clashes in the south. Improvements are slow to come into being in the economic domain and so tangible improvements are not seen in the short term. The overall situation is stabilised with a general sense of hope for the future.

Challenge: Maintain stability of situation to facilitate future stability and growth.

Example 2 – Analysis of competing hypotheses

A.2. Fantasia has recently suffered a series of vehicle-borne improvised explosive device attacks in its capital. Fantasia is currently fighting a long war with its neighbour, Beravia, and is struggling with a home-grown insurgency from the Jugland Liberation Front, whose aim is to gain independence for its southern territories, Jugland. In addition, there is a growing right-wing movement among the military called the Fantasian Brotherhood who are tired of the war and wish to oust the current government and bring the conflict to an end.

Who is responsible for the attacks in the Fantasian capital?

Criteria	Beravian Special Forces	Jugland Liberation Front	Fantasian Brotherhood
Previous use of attack methodology	✗	✓	✗
Claimed responsibility	✗	✓	✓
Consistent with stated aims	✓	✓	✓
Sophisticated methodology	✓	✗	✓
Tolerance for civilian casualties	N/A	✓	✗
Reports of operators in area	✗	✓	N/A

Order of likelihood

1. Jugland Liberation Front.
2. Fantasian Brotherhood.
3. Beravian Special Forces.

Annex B

Red cell force field example

B.1. Annex B presents a worked example of a red cell force field analysis. It demonstrates how the matrix can be populated to develop a deeper understanding of how the adversary might react to a specific situation.

Enablers		Attitude	Resistors	
Conditions	<ul style="list-style-type: none"> Substantial oil reserves waiting to be exploited. Economy in crisis due to conflict. 	Likelihood of signing peace agreement	<ul style="list-style-type: none"> Currently holding substantial parts of enemy territory. 	Conditions
Beliefs	<ul style="list-style-type: none"> Foreign investment seen as likely to open up if conflict ceases. 		<ul style="list-style-type: none"> Home team believed to be responsible for starting conflict. Peace brokering organisations seen as self-serving. 	Beliefs
Motives	<ul style="list-style-type: none"> Security – desire for stability in country. Achievement – focused on improving country. Recognition – leaders need personal acknowledgement. 		<ul style="list-style-type: none"> Aggression – tends to be combative. 	Motives
Values	<ul style="list-style-type: none"> High power distance – no need to court popularity with public. Short-term focus – need for quick wins. 		<ul style="list-style-type: none"> Collectivist – need to convince all of the cabinet. Uncertainty avoidance – sees things in absolute terms. Masculine – resolution through conflict. 	Values

Notes

Lexicon

This lexicon is divided into two sections. Section 1 provides a list of unendorsed definitions that may be helpful to the reader. Section 2 lists the picture copyrights that have been used in this publication.

Section 1 – Terms and definitions

alternative analysis

The deliberate application of independent, critical thought and alternative perspective to improve decision-making.

alternative futures analysis

A red teaming technique for exploring the different ways in which a situation can develop. It is best used in situations that are complex and involve a high degree of uncertainty. This technique produces multiple possible outcomes.

ambiguity effect

A tendency to avoid options where the likelihood of a good outcome is not known.

analysis of competing hypothesis

A red teaming technique for examining a problem where there are several hypotheses that explain a situation in terms of what has happened to cause the event, what the scenario actually is and how it may unfold in the future.

anchoring

A mental shortcut or heuristic where the individual, when considering a problem, uses a prompt or past experience as the starting point for their thinking. The problem is that the prompt acts like an anchor and the individual typically fails to adequately adjust their thinking away from this starting point.

argument mapping

A red teaming technique for assessing the robustness of the logic used to build an argument. An argument mapping exercise can help ensure that the logic used is coherent, structured and fit for purpose.

assumptions check

A red teaming technique in which both implicit and explicit assumptions, based on past experience, can be examined and checked.

assumptions review

A red teaming technique similar to the assumptions check technique but involves a more thorough analysis of the assumptions.

authority

The principle of persuasion where an individual is influenced by someone who holds some kind of power. This can be formal in nature, where the other person holds a position in an organisational hierarchy or where the power comes from a legal authority. Authority can also be informal in nature, where the power comes from acknowledged expertise, competence or experience.

availability heuristic

A mental shortcut where an individual, when asked to think of something, recalls the most available answer. The problem is the most readily available answer is not necessarily the correct solution.

base rate neglect

A tendency to focus on case-specific data and give insufficient consideration to the background information or the base rate.

beliefs

The specific views held by an individual or group. These views may or may not be supported by any evidence or truth. These beliefs can be specific views held about a particular subject or a broader set of beliefs such as a political philosophy or a religious code.

brainstorming

A red teaming technique that can help to ensure a wider and more diverse approach to problem solving. This technique can be as short or as lengthy as time permits.

cognitive bias

A systematic error in thinking that occurs when individuals (and teams) are searching for, processing and interpreting information and which affects the decisions and judgements made on the basis of this information.

cognitive dissonance

A skewed interpretation of information involving active denial and dismissal of conflicting information. Cognitive dissonance occurs when there is a discrepancy between a firmly held belief or mindset and incoming information.

conditions

Environmental factors that either constrain or enable an individual's thinking and actions.

cone of plausibility exercise

A red teaming technique designed to create different scenarios of how a situation might unfold. It can, therefore, be used to create and evaluate alternative perspectives to a problem.

confirmation bias

The tendency to search for, notice, attend to and process information that agrees with or confirms a closely held idea or hypothesis. In this way, information that supports a preconceived notion is more readily accepted and given less scrutiny.

conjunction fallacy

A tendency to assess that a more specific situation is more likely to happen than a more general situation.

consensus

The principle of persuasion where an individual looks to others as a guide for how to proceed, especially when they are uncertain of what direction to take. It is a form of group or peer pressure.

conservatism bias

A tendency to fail to revise thinking when presented with new information.

consistency principle

The principle of persuasion where an individual is influenced to behave in accordance with previous commitments or actions.

continued influence effect

A tendency to continue to believe misinformation even after it has been challenged.

contrast effect

A tendency to evaluate something by comparing it to a contrasting experience.

critical thinking

The robust analysis of facts to form a sound judgement. It involves the rational, unbiased analysis of factual evidence. Critical thinking is designed to overcome the natural biases that human beings bring to information processing, decision-making and problem solving.

default effect

A tendency to favour the default option when presented with a choice.

devil's advocacy

A red teaming technique that can be used to challenge the confidence in a plan and identify any weak points that might exist. Devil's advocacy can be used to identify the potential flaws in a plan and thus challenge any sense of overconfidence and force decision-makers to reconsider their approach.

endowment effect

The psychological mechanism where an item, either an object or an idea, is more highly valued when it is owned by the individual. The high value placed on the object or idea means that it then becomes difficult to give it up.

everyone speaks once before someone speaks twice, seniors speak last

A red teaming technique that involves ensuring that everyone in a brainstorming group contributes before someone speaks twice. More senior individuals in the group go last.

exposure effect

An individual's perception of the significance of an event or piece of information and the risk that it poses can be affected by their familiarity with the issue in question. The exposure effect means that the more an individual becomes exposed to something, the more familiar it becomes and thus less interesting or threatening.

force field analysis

A red teaming technique that enables the analytical process by plotting all the relevant factors on one page for easy reference.

framing effect

The manner in which a question or problem is framed can have a significant effect on how an individual perceives the risks associated with the situation.

goal-directed behaviour

A cognitive bias that occurs when an individual has a strong or clear preconceived idea of what they are looking for or expecting to happen. The information search becomes narrowly focused on this idea and the individual does not attend to other aspects of the environment.

groupthink

A psychological process that refers to the internal social pressures that can lead a closely knit (and generally high functioning group) to commit errors of judgement.

high impact – low probability analysis

A red teaming technique that can help decision-makers to consider a wide range of events, especially those they might not consider likely.

hindsight bias

A psychological mechanism whereby an individual convinces themselves after an event that they had accurately predicted it before it happened. This view can then lead the individual to believe that they can accurately predict other events.

IKEA effect

A tendency to have greater ownership over something when the individual or team has developed it themselves.

illusion of control

A tendency for a person to overestimate their influence over external events.

issue redefinition

A red teaming technique that can reduce the risk of missing important internal and external issues early in a planning process.

liking principle

The principle of persuasion where an individual is more influenced by people they like.

loss aversion

A tendency to feel potential losses more keenly than potential gains.

motives

Motivational drivers both energise and direct the behaviour of adversary leaders.

need for cognitive closure

The desire for a confident judgement on an issue, to have closure as quickly as possible.

neglect of probability

A tendency to disregard the probability of certain outcomes or events when making a decision.

normalcy bias

The inability to plan for a (negative) situation that has never occurred before.

optimism bias

A tendency for an individual to believe that they are less likely to experience a negative event. In planning and decision-making terms, it refers to an overly positive or confident belief that the plan will work.

ostrich effect

A tendency to ignore an obvious negative situation if it challenges the 'received wisdom'.

outcome bias

A tendency to judge a decision by its eventual outcome instead of the quality of the decision made at the time.

outside-in thinking

A red teaming technique that involves viewing the problem from an external perspective.

plan continuation bias

An inability to notice or accept that an original plan of action is no longer appropriate for a changing situation.

planning fallacy

The tendency to underestimate the time required to complete a future task based on optimism but also due to a lack of consideration of external factors that might delay or disrupt the task. A narrow, inward focus to the planning of a task, with a consequent neglect of external factors. The impact is on not just the time required but also the likelihood of success more broadly.

pre-mortem analysis

A red teaming technique that is very effective at identifying any potential problems and points of failure in a plan. The basic concept is like a post-mortem but whereas this procedure is conducted after death has occurred to identify the causes, a pre-mortem is conducted beforehand to identify potentially fatal causes and therefore prevent 'death' or failure of the plan.

quality of information check

A red teaming technique that evaluates the accuracy and reliability of the information or evidence base used to build a case.

reciprocity principle

The principle of persuasion where an individual is influenced by others that they feel obligated to.

red cell

A group whose main purpose is to adopt the viewpoint or indeed persona of an adversary or key stakeholder. Red cells can produce several outcomes such as developing adversary estimates and plans, as well as providing insight into how the adversary may react to friendly forces. If conducted formally as a group, the team can also role play the adversary in any wargaming exercises.

red team

A team that is formed with the objective of subjecting an organisation's plans, programmes, ideas and assumptions to rigorous analysis and challenge. (Joint Doctrine Publication (JDP) 0-01.1, *UK Terminology Supplement to NATOTerm*)

red teaming

The independent application of a range of structured, creative and critical thinking techniques to assist the end user make a better-informed decision or produce a more robust product. (JDP 0-01.1, *UK Terminology Supplement to NATOTerm*)

red team mindset

A philosophy or state of mind where problem solvers and decision-makers apply red teaming techniques and approaches to everyday challenges and problems routinely. It is a habitual mode of thinking and working that involves fast and efficient approaches in time-pressured scenarios across a range of situations and levels within an organisation. The concept of a red team mindset is very similar to critical thinking.

salience bias

A tendency to focus on items that are more prominent or emotive and ignore those that are less striking.

scarcity principle

The principle of persuasion where an individual acts prematurely and reaches a decision quickly when timescales are perceived to be short.

selection bias

A tendency to notice something more when something causes people to be more aware of it.

selective perception

A cognitive bias that occurs when something captures an individual's attention and they become fixated on this aspect. Selective perception is similar to goal-directed behaviour in that the fixation means that the information search is too narrow or is cut short. The difference between the two mechanisms is that with selective perception, the individual does not enter into the situation with a preconceived goal; the novelty or apparent significance of the piece of information grabs and dominates the person's attention.

shared information bias

A tendency for groups to spend more time discussing shared information than unshared information.

stakeholder mapping

A red teaming technique for moving away from the information and arguments that support a plan or decision, the internal considerations, and focusing on the wider implications of the proposition. A key aspect that is often forgotten or not given sufficient consideration is the stakeholders who will have an impact on and/or be impacted by the plan.

status quo bias

A preference for the current or past state of affairs. Individuals suffering from this bias focus on the present and past state of affairs; issues are seen as not changing in nature, or at least only slowly evolving over a long period of time, and therefore threats or challenges are seen as essentially staying the same.

structured self-critique

A red teaming technique that involves asking a series of questions to evaluate the quality of information processing.

sunken costs

A tendency to carry on with something because resources such as time, effort or money have already been invested in it.

system one thinking

A cognitive process that involves individuals thinking in fast, intuitive ways when considering problems. System one thinking is suitable for everyday decisions with limited consequences.

system two thinking

A cognitive process that involves individuals thinking in a deliberate and analytical manner. System two thinking is applied to deal with more complex and consequential problems.

values

Culturally defined ways that the adversary uses to make sense of the world and guide its thinking and actions. These values can be viewed at the group or even national level.

what if analysis

A red teaming technique that can help individuals and teams consider risk more broadly and involves imagining that a plan has failed and working backwards to determine what might have caused the failure.

worse-than-average effect

A tendency to believe that others have more competence or expertise and thus defer to them.

zero-risk bias

A preference for completely eliminating a small risk rather than partially mitigating a larger risk.

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