SAFEGUARDING THE FUTURE

A Foresight Handbook for Security and Defence Professionals

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ARCHIPELAGO

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We cannot just hope for the future we want,
we have to prepare for the future we might get.

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This handbook is designed to provide leaders among NATO allies and partners with the mindsets and practical tools needed to future-proof activities that benefit from a long-term perspective, such as operational planning, strategy-making, business planning, and force development. The foresight handbook aims to help NATO evolve into an organization better equipped to handle uncertainties and possibilities of the future. To achieve this transformation, leaders must harness the collective intelligence of their teams and key stakeholders. In creating this handbook, we followed this principle by engaging with our defence and security peers to ensure it reflects the best practices in the foresight community among NATO members and partners.

Safeguarding the Future wouldn't exist without the contributions and support of many remarkable individuals who continue to support the vision of the Archipelago of Design (AOD) to empower leaders in shifting the mindsets of their team in national security organizations across NATO members and partners.

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We extend our appreciation to the pioneers of foresight, whose dedication to understanding and shaping the future paved the way for the exploration of frameworks and tools presented in this handbook.

Our deepest thanks also goes out to the early adopters and practitioners of foresight. Your willingness to share your experiences, insights and feedback has been invaluable in shaping this handbook's content and ensuring its relevance to real-world applications.

We invite you to share your insights and lessons learned from using this handbook and foresight in general by joining AOD's collaborative network, and to engage the community on our social media channels. Learn more at aodnetwork.ca.

Foresight Glossary

Critical Uncertainties: key factors that are both highly important and highly unpredictable, and that can significantly influence the future of the domain being explored.

Divergent-thinking: describes an intentional process that aims to generate a variety of different perspectives on an issue, challenge or problem set. Divergent thinking is a useful practice for clarifying the perspectives of different stakeholders who are impacted by a complex problem, and can also draw out potential solutions that might not be considered otherwise. It is complementary to convergent thinking, which aims to generate consensus on a challenge and to focus thinking around a specific approach or solution to the challenge.

Drivers of Change: are the forces and trends that shape the future landscape, influencing how events unfold. These are large scale forces that shape trends in all aspects of life, often immune to rapid change or influence.

Exploratory: refers to ways of thinking about the world that are open-ended and speculative. Exploratory thinking aims to understand how things might be different than they currently are, and how the current state of affairs might evolve in ways that challenge the present outlook on the future.

Long term: frequently refers to the next 20-50+ years. Some foresight activities take an even longer timeframe of 50-100 years.

Mid-term: often refers to a timescale of 5-20 years.

Methodology: a process that is followed where a combination of tools are used to examine the future.

Normative: is a term used to describe a consensus viewpoint that is shared by a group of people or a specific organization, and that provides a foundation for making value judgements about the choices, activities and outcomes of a given actor or set of circumstances. When used in a foresight context, a normative claim is usually couched in action words like “should” or “must”, and describes an ideal situation from the perspective of the individuals who make the normative claim.

PMESII: refers to Political, Military, Economic, Social, Information, Infrastructure. PMESII is an analytic tool that can be used in the same way as STEEPV. It was conceived for military planning and strategy applications.

Scenarios: narratives of possible futures, not predictions.

Short-term: in foresight, this typically refers to the next 3-5 years. Timeframes in a foresight context are often longer than in other contexts.

STEEPV: refers to Social, Technological, Economic, Environmental and Values. STEEPV is an analytic tool that can be used to identify emerging trends and opportunities in different domains and map out their potential impacts on an organization or field.

Strategic Foresight: is a structured way of thinking about the future that considers the potential of high-impact developments with the possibility to challenge existing projects, organizational plans, outlooks, and systemic processes. It provides a framework for anticipating events and dealing with uncertainties. As a practice, it helps people develop responses that allow them to pivot towards, adapt to or capitalize on conditions that would complicate their organization’s mandate or initiatives.

SWOT: refers to strengths, weaknesses, opportunities and threats and is a framework that can be used to analyze an organization’s strategic position or competitive advantage.

Tools: a specific way of exploring emerging, complex, and uncertain aspects of possible futures.

Trends: can be described as a collection of signals that point to emerging or ongoing change. The nature of the change that the trend is indicating can be described as either increasing or decreasing in intensity or frequency over a period of time.

Weak Signals: are an early indication of an emerging trend, development, or disruption, often with uncertain or unknown consequences. Weak signals can develop into ‘strong signals’ or trends but can also end up having limited to no impact on future developments.

INTRODUCTION

Governments, businesses, defence and security organizations, and public institutions around the world are confronting increasing global instability. As the speed and scale of change accelerate, scenarios that were once unimaginable have emerged as significant drivers of global transformation. Our present is marked by a compounding series of high-impact events and systemic shifts like the COVID pandemic, the Russian invasion of Ukraine, tensions in Africa and Asia and the escalating conflict that followed the October 7, 2023 attacks in Israel. Not only is the pace of change rapid and turbulent, it is often unpredictable. In conditions of widespread turmoil, how can we better anticipate future possibilities and prepare for their potential impacts?

Introduction

The Archipelago of Design (AOD) conceived this practical foresight handbook to empower leaders and their teams with future-ready mindsets. Learning to implement these mindsets is required to ensure organizational relevance and to gain an advantage in complex situations. But more concretely, they are required to future-proof plans, policies and strategies. Strategic foresight helps in crafting strategies that are resilient, adaptive, and proactive in the face of uncertainty. This is especially relevant to expanding the time horizon of NATO's Comprehensive Operations Planning Directive (COPD) in the next ten years and beyond. Teams with future-ready mindsets are better equipped to reckon with the long-term strategic impacts of intervention (or non-intervention), including potential unintended consequences, and enable their organizations to succeed in the long run. Likewise, they will be better prepared to anticipate and manage contingencies when operations do not immediately yield the desired results. Beyond operations, defence and national security teams can mobilize foresight to increase the resilience of any strategy, modernization, renewal, transformation and force development initiatives to name a few.

This handbook begins to fill a gap in existing military and defence planning approaches. Detailed planning methods such as COPD are necessary for organizing lines of efforts and sequencing capabilities to achieve objectives in the near term. These planning methods tend to focus on a single end state that defines the near future. Foresight expands this scope by anticipating multiple futures over a longer timescale, making planning more resilient to uncertainties. Foresight complements planning by taking into consideration non-linear developments that can upend expectations. Finally, foresight mobilizes the collective intelligence of teams, and works best when teams actively solicit diverse perspectives to challenge their own cognitive biases. For these reasons, existing planning methods should not substitute for foresight and foresight should not replace detailed planning. Rather, they should be used as complementary approaches.

"Strategic foresight is a structured and systematic way of using ideas about the future to anticipate and better prepare for change." (OECD n.d.)

https://www.oecd.org/strategic-foresight/

NATO's Allied Command Transformation (ACT), for example, conducts strategic foresight work including biennial trend analyses such as the recent Strategic Foresight Analysis of 2023. While these reports are insightful for informing strategic assessment, they cannot represent all the nuances of the specific problem sets faced by planning teams or decision makers across the alliance. Teams who undertake collaborative foresight activities of their own design will benefit from an enhanced sense of ownership over the results in ways that teams who simply consult external documents will not. Moreover, for foresight activities to be effective, they need to be flexible, anticipatory and context-specific. This handbook suggests a variety of alternatives for refreshing your team's outlook on the future. Most importantly, this handbook empowers teams to develop future-thinking skills that can be adapted to any initiative. Not only are foresight capabilities useful for dedicated NATO ACT branches, they can also be leveraged by any unit involved in planning, strategy making or decision making.

This handbook is, we hope, a contribution to NATO's effort of consolidating a foresight handbook for defence and security teams to utilize in support of their organizations' initiatives. This handbook is also a springboard for teams to develop their future-thinking skills by experimenting with nine tools that have already proven valuable to defence and national security practitioners across the alliance over the last ten years. This handbook was developed with the aspirations that these tools will become stepping stones towards developing future-ready mindsets that can tackle complex challenges arising from accelerating change.

Foresight expands planning methods by anticipating multiple futures over a longer timescale, making planning more resilient to uncertainties.

Foresight as a practice differentiates between two main types of futures investigations. Normative futures, a term which describes desired or preferred circumstances, are helpful for building shared understandings or setting strategic objectives. Exploratory futures describes foresight work that speculates about a range of plausible future conditions arising from trends and drivers of change. The exploratory futures approach can be used to build resilience, especially in complex situations, and is often used to test strategic viability. This handbook includes tools that enable both approaches.

This handbook will give you detailed information on how to apply a range of foresight methods that have particular resonance in the defence and national security realms. These tools are calibrated for use in both the public and private sector environment suitable for a range of experience levels. The handbook covers an overview of each tool, including step-by-step instructions, an explanation of when and how to use the tool, and a relevant case study. It also provides links to useful resources to further your understanding of foresight, in addition to a glossary of key foresight terms.

Effective Facilitation

You should carefully consider the purpose of your foresight exploration to determine which of these tools is best suited to your application. Each method in this handbook is described with information about when to use it, including details about ideal group size and how to set up the activity online and in-person. Whichever delivery method you use, here are some guidelines to help you facilitate to get the most out of these foresight tools and the talents of your team:

1. **Be prepared.**
   Before you conduct a workshop or exercise, read through all the materials provided for that method. A well-prepared facilitator can handle unexpected challenges and still help the group arrive at a successful outcome.

2. **Set up your workspace in advance.**
   Make sure you have a white board or a big pad of paper, markers, sticky notes, etc. for in-person collaboration, or prepare your digital collaboration space using tools such as Miro, MS Whiteboard or Mural if facilitating online.

3. **Practice makes perfect.**
   Testing the method in a low-stakes situation can be helpful to assess whether to modify the tools and elevate the experience for your group. It can be helpful to run through the activity (sometimes called a dry run) with a trusted team member to work out any complications before facilitating a larger group.

4. **Remain curious.**
   Listen carefully to your participants and ask clarifying questions throughout the process. Don't ask questions that undermine the validity of ideas, rather assume that any idea could work. Sometimes this is framed as asking "Yes and…" questions. Focus on the group rather than on your role as the leader of the activity. This is critical if you are trying to surface new solutions. As the facilitator, you are guiding the process rather than acting as a participant sharing your perspective.

5. **Create opportunities.**
   Ensure all participants have an opportunity to contribute. For example, giving more quiet team members a chance to write their thoughts on sticky notes can draw out their perspectives. Enabling turn-taking with clear instructions and firm guidance will ensure that one person doesn't dominate the discussion.

6. **Synthesize findings.**
   You are overseeing the foresight method you've selected rather than actively participating, which means you might observe patterns and insights that participants may miss because they are caught up in the details. Share these insights with the group as you progress. Participants may get deep "in the weeds" and your overview can help them see the bigger picture they're drawing out through the activity.

PROCESS

Safeguarding the Future was developed from reflections of practitioners on their experiences and was informed by thorough research on background history and theory for all the articulated methods. The authors of this handbook conducted semi-structured interviews with seven foresight and futures-thinking professionals. Their experience applying foresight in defence and national security, in Canada and internationally, allowed us to tailor the approaches described in this handbook to resonate with professionals in those fields. Background research was conducted in collaboration with research assistants from Lancaster University Richardson Institute for Peace Studies, who contributed specific knowledge of geopolitics and security and defence challenges. They also provided the case studies describing applications for the tools.

FORESIGHT TOOLS

The Foresight Tools

1. Horizon Scanning
2. Futures Wheel
3. Three Horizons
4. Futures Triangle
5. Causal Layered Analysis (CLA)
6. 2x2 Matrix
7. Johari Window
8. Generic Images of the Future
9. Backcasting

How to use this section

This section of the handbook provides you with nine foresight tools and additional information on how to use them in a defence and security context. Each tool has several tags to help you select the right tool for the job. These tags identify whether the tool is normative (i.e., looking at ideal futures) or exploratory (i.e., looking at possible or plausible futures), ranks the tool's difficulty (depending on your experience and familiarity with foresight concepts), and notes its time requirements (i.e., how long you should expect an exercise using the tool to take).

Understanding a tool's strengths and weaknesses also helps you select an appropriate tool based on the outcome you are looking for. Some tools are better suited to exploring unknown or uncertain aspects of futures, while others are better suited to exploring consequences of decision-making and existing narratives that might lead to possible futures. The tool sections also suggest considerations for the facilitator, participants, materials, and timescale (i.e., how far into the future you are looking) to help you get the most out of these tools. Some tools require some preparation regarding the type of information or inputs you want to feed into them. Similarly, understanding how tools produce certain results and how to make use of those outputs is a key consideration when selecting tools for foresight activities.

Once you have selected a tool that is well-suited for your purposes, the overview will give you a brief summary of that tool, what it does, and how best to use it. The step-by-step guide provides a clear process to follow when using the tool and is a handy reference when guiding a team through a foresight exercise. The "why use it" section goes into more detail about how the tool fits into a broader foresight process and the "when to use it" section provides a more detailed explanation on how to identify the appropriate use cases for the tool. Finally, the tool sections wrap up with a real-world example of how these tools have been used in defence and security contexts around the world.

References and additional resources have been provided at the end of this document if you would like to explore these tools, other foresight tools, or the foresight process further. We hope that this information makes it easier for you to incorporate foresight into your professional practice, no matter how far along you are in your foresight journey.

1

TOOL 1

Horizon Scanning

TYPE: Normative (Exploratory)

DIFFICULTY: (Introductory) Intermediate Advanced

TIME: 1 Hour (Half Day) (1 Day) (Ongoing)

Overview

Horizon Scanning forms the starting point of many foresight activities and approaches. The core function of Horizon Scanning is to systematically gather and analyze information about emerging trends and developments before they enter the mainstream, and to understand how they might converge and interact to shape potential futures. Weak signals, as potential indicators of change in their early stages, should involve identifying data that piques your curiosity, seems out of place, or is otherwise noteworthy. Scanning for weak signals can be further guided by frameworks such as STEEPV (Social, Technological, Economic, Environmental, Political, Values) or PMESII (Political, Military, Economic, Social, Information, Infrastructure). Categorizing gathered signals using these frameworks can reveal blind spots in the scan and promote a diverse range of sources.

Using these frameworks to organize signals can also be helpful in identifying patterns or connections that might not be immediately obvious. Trends are identified by recognizing patterns or connections between weak signals that indicate recurring themes, events, or developments across varied sources. However, trends should not be assumed as facts. Trends are dynamic in nature and their potential effect on future outcomes can be altered by things like shifting behaviours, legislation and policy changes, or unexpected events.

While Horizon Scans do not predict the future, they do identify highly probable forces that will influence potential futures.

The more certain forces that shape the future are referred to as drivers or driving forces. Because of their broad-reaching influence, they are relevant to many future challenges or areas of inquiry. It is important to consider their influence on short-term trends and how that may impact their stability and certainty. While it may be tempting to trust the conclusions drawn from these driving forces, it's crucial to understand that Horizon Scanning inherently involves incomplete information as it focuses on identifying the early stages of changing trends and volatile weak signals. While Horizon Scans do not predict the future, they do identify highly probable forces that will influence potential futures.

- *Weak Signals:* These are an early indication of an emerging trend, development, or disruption, often with uncertain or unknown consequences. Weak signals can develop into 'strong signals' or trends. However, weak signals may also end up having limited to no impact on future developments.
- *Trends:* These can be described as a collection of signals that point to emerging or ongoing change. The nature of the change that the trend is indicating can be described as either increasing or decreasing in intensity or frequency over a period of time.
- *Drivers of Change:* These are the forces that shape the future landscape, influencing how events unfold. These are large scale forces that shape trends in all aspects of life, often immune to rapid change or influence.

Strength: Horizon Scanning is a foundational tool that provides a solid starting point for many other foresight activities.

Weakness: A Horizon Scan can be targeted or broad, either of which has limitations. A broad-reaching Horizon Scan can be too far reaching to be meaningful if the challenge to which it is applied is already well-defined. On the other hand, a targeted Horizon Scan might overlook significant outlier signals, especially when the challenge appears well-defined, potentially leading the scan to omit important areas of influence.

Facilitator: Horizon Scans are simple to carry out once participants are familiar with key terms and the process. For less experienced participants, a facilitator can help by clarifying unfamiliar terms, defining the process and setting boundaries for the scan.

The quality of the output from a Horizon Scan will be improved if participants who have some subject-specific knowledge can maintain an open mind when searching for signals.

Participants: 1+ people. Horizon Scanning can be done by individuals or in teams. The quality of the output from a Horizon Scan will be improved if participants who have some subject-specific knowledge can maintain an open mind when searching for signals. Due to their deep knowledge and specialization, expert participants may inadvertently restrict the scope of a scanning activity by focusing too narrowly on their specific area of expertise.

Timescale: 5 to 50 years. Horizon Scans cover a wide range of timescales. The timescale of a Horizon Scan can vary depending on the intent and the specific context. For example, a short term scan 5-10 years in the future may be long enough to identify signals and trends to inform strategy but not long enough to clarify long-term drivers of change. To understand impactful long-term drivers of change, a timescale of 20-50+ years might be more appropriate.

Inputs: A broad Horizon Scan is an effective initial exercise for any planning or strategy activity, so you do not need to prepare by organizing information in advance beyond a general theme of exploration. However, a targeted scan may be useful if the area of exploration is already well defined. Regardless of the type of scan, minimal constraints are ideal to avoid unnecessarily limiting the scan.

Outputs: This tool will give you a set of categorized, prioritized, and mapped pieces of information (signals) that indicate emerging trends and drivers of change. You can use these outputs as a baseline of further exploration and deeper analysis. The outputs of Horizon Scanning exercises are especially useful for scenario-based exercises because they provide valuable insights that can make scenarios more realistic, informative, and effective for strategic planning and decision-making.

Horizon Scanning Step-by-Step Guide

1. **Defining the parameters** – Decide whether you're setting up the framework for an ongoing scanning process (perhaps an hour every week or a ½ day every month) or a limited scan (½ day or full day workshop). Ongoing scanning can be done individually or by a team. A targeted scan is more appropriate for a group.

2. **Define the scope** – Scans can be targeted (around a defined area of inquiry or specific topic) or broad (around a more general scan of general topics or overarching themes of interest).

	Broad Scope	**Targeted Scope**
Ongoing Process	Continuous or periodic monitoring of diverse trends and emerging issues across various sectors or areas, without predefined boundaries or limitations.	Focused monitoring of specific trends or developments within a defined area of interest, providing in-depth insights and analysis.
Limited Process	Bounded analysis of overarching themes or general topics within a broader context, within a predefined time frame.	Intensive investigation into a defined area of inquiry or specific phenomena, aiming for a thorough understanding within a limited scope.

Horizon Scanning Visualized

This diagram illustrates the relationship between key components of the Horizon Scan.

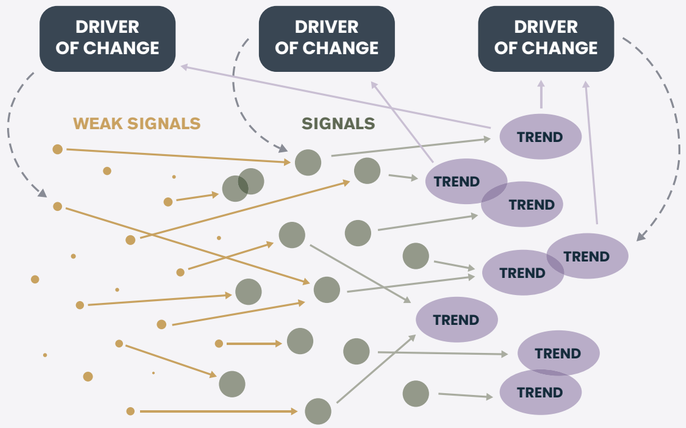

Figure 1
Horizon scanning visualized. Adapted from "How to Future: Leading and Sense-making in an Age of Hyperchange". Smith, S., & Ashby, M. (2020).

3 **Scanning for weak signals** – Signals should be informed by a wide range of source materials. Weak signals can be a data point, a behaviour, a scientific finding, an item of news, or a cultural phenomenon which can be found in any kind of media such as newspapers, journals, think-tank publications, social media posts, etc. Pay attention to the fringes by expanding your attention to voices and trends that don't fit in with your established field, or inputs from unexpected sources. Write out your signals with a brief description on sticky notes or digitally. Participants can work alone or in teams during this stage, but must be prepared to share their findings in the next step. Participants should also take preliminary notes on any related signals and should begin to identify which connections seem to hold the most significance or saliency.

4 **Analyze your signals** – Consider using STEEPV (Social, Technological, Economic, Environmental, Political, Values) or PMESII (Political, Military, Economic, Social, Information, Infrastructure) to sort your gathered signals. Sort signals into thematic clusters. Have a brief discussion on what those similarities are and what trends they may describe. Give your trend a name, an indication of whether it's increasing or decreasing in intensity or frequency (draw an up or down arrow beside the trend name), briefly describe the future implications or longer term changes which are influenced by that trend, and cite which weak signals have influenced that trend.

5 **Validate your findings** – At this point, a validation process can help mitigate individual biases in the selection of signals and trends taken forward. To validate your findings, they should be presented to additional people outside of the participant group who may have different perspectives.

6 **Examine your trends** – Similar to step 4, look for any patterns or trends that could influence one another. Draw arrows on a white board or digital platform connecting related trends. Describe how they would interact. These are the larger driving forces of change.

7 **Prioritize** – After conducting a Horizon Scan, a prioritization process can help you develop qualified judgements from the rich data collected. At this phase, outputs should be evaluated on the likelihood, plausibility, and possible significance of the trends and drivers identified.

Why use Horizon Scanning

Horizon Scanning is arguably a foundational component of any foresight toolkit, serving as the process that translates real-world data and information into a shared understanding of forces that will shape the future. It should always be undertaken with the understanding that its outputs are not predictive. Rather, Horizon Scanning identifies indicators and themes that help focus collection resources on monitoring and detecting early warnings.

Horizon Scanning is an approachable tool that provides a way of interrogating future possibilities with very little prior knowledge or experience needed on the part of its users. When used iteratively, it allows new practitioners to hone their foresight skills. The scalability of the tool lends itself to versatile applications, though Horizon Scans are best employed on a recurring basis. This allows you to monitor trends and how they may intensify, fade, or change, as you and your team develop a deeper understanding of how they play into larger drivers of change.

The outputs of Horizon Scanning serve as a stepping stone for further foresight endeavours, including scenario planning exercises and the futures wheel technique.

The results generated by this tool lay a solid groundwork for a more profound investigation into foresight. The outputs serve as a stepping stone for further foresight endeavours, including scenario planning exercises and the futures wheel technique. Utilizing these additional methods allows for a thorough examination and impact assessment of the identified signals, trends, or driving forces, ensuring they hold up when tested against various future possibilities and conditions. This comprehensive approach not only confirms the initial findings but also enriches the foresight process with multi-faceted perspectives, which are essential for robust strategic planning.

When to use Horizon Scanning

Horizon Scanning is essential for staying ahead of trends and assessing the opportunities and threats they may present.

Horizon Scanning is a valuable exercise for organizations aiming to enhance their readiness for unpredictable futures. While it's often challenging to forecast specific events, consistently engaging in Horizon Scanning can significantly bolster a defence organization's preparedness and flexibility by avoiding strategic surprise and allowing anticipation of future requirements. Defence and security teams can employ Horizon Scanning on an ongoing basis as an alerting activity to identify emerging issues. It is particularly useful for picking up early warning signals and providing insights into how to organize and explore weak signals. This methodology is essential for staying ahead of technological trends and assessing the opportunities and threats they may present. It also helps to flag breakthroughs and innovations in the fields of science and technology, which can be crucial for maintaining a military's technological edge.

Horizon Scanning offers significant benefits for anticipating future threats, enabling the recognition of potential risks before they fully materialize. It is also valuable for tracking innovations, as it helps identify developments in new knowledge that could impact defence and security. By highlighting critical areas of focus, Horizon Scanning aids in resource prioritization and informs effective resource allocation. Additionally, it provides a foundation for developing long-term strategies, supporting strategic planning by aligning with upcoming trends and developments. In essence, Horizon Scanning can be integrated into the strategic planning, policy development, and decision-making processes of defence and security teams to ensure preparedness and strategic advantage in a rapidly evolving global security environment.

HORIZON SCANNING
CASE STUDY

NATO Cooperative Cyber Defence Centre of Excellence

The NATO Cooperative Cyber Defence Centre of Excellence uses Horizon Scanning to identify emerging technologies likely to shape the future of the cyber threat landscape. In a section of the report titled "The Impact of New and Emerging Technologies on the Cyber Threat Landscape and Their Implications for NATO," the authors highlight how they used a horizon-scanning database for their foresight work. This is an example of a highly sophisticated horizon scan that sorts through huge amounts of data to identify weak signals of emerging technologies and potential threats. The most prevalent threats that the scan identified from a NATO perspective are: artificial intelligence and machine learning; autonomous devices and systems; telecommunications and computing technologies; satellites and space assets; human-machine interfaces; and quantum computing. While more trends were identified and over 3000 signals analyzed, these ones were selected for their potential impact and likelihood of occurring over the next decade.

To read more about the NATO Co-operative Cyber Defence Centre of Excellence horizon scan, see: https://ccdcoe.org/uploads/2020/12/Cyber-Threats-and-NATO-2030_Horizon-Scanning-and-Analysis.pdf

2

TOOL 2

Futures Wheel

TYPE: Normative (Exploratory)

DIFFICULTY: (Introductory) Intermediate Advanced

TIME: (1 Hour) (Half Day) 1 Day Ongoing

Overview

The Futures Wheel is a structured brainstorming process designed to explore and visualize the direct, indirect, and subsequent consequences of a particular change, action, event, or trend. First created by Jerome Glenn in 1971, the tool aims to identify unforeseen impacts of critical events and to identify relationships between those impacts and events. The process begins with a central issue or circumstantial change which is placed in the centre of the wheel. The first layer of the Futures Wheel identifies the immediate or primary consequences around this central issue, followed by the secondary effects for each primary consequence, and then the third-level or tertiary consequences.

The Futures Wheel aids in visualizing connections. Participants can clearly see and understand their perceptions of complex relationships between events and their potential ramifications.

Strength: The Futures Wheel is a user-friendly tool that can be applied at any stage of futures research to explore outcomes of a particular event or trend. It doesn't require advanced training, which allows users who are new to foresight to easily apply it. Because the Futures Wheel aids in visualizing connections, participants can clearly see and understand their perceptions of complex relationships between events and their potential ramifications.

Weakness: This tool may oversimplify complex future impacts, potentially missing out on nuanced details or interactions, including the timing of events and their likelihood of occurrence. Additionally, participants might mistakenly identify correlations as causal relationships, interpreting potential consequences as guaranteed or inevitable outcomes, as opposed to possibilities or potential impacts.

Facilitator: A facilitator is not required but can be helpful if participants encounter difficulties while assessing a complex issue.

Participants: 1-5 people. This tool can be used by an individual or a group of up to five participants.

Timescale: 5 to 15 years. Futures Wheel is optimal for exploring mid-term futures but can vary depending on context or objectives.

Inputs: The required inputs of a Futures Wheel exercise include the central issue or event being examined, which is used to identify direct consequences and subsequent levels of indirect consequences from that event. Information about timing and probability of such an event may also be relevant to include when constructing the Futures Wheel.

Outputs: Outputs include the diagram of the Futures Wheel, which visualizes first, second and third order consequences of a particular event. Fourth-order and fifth-order consequences may also be revealed depending on the depth of exploration on the central issue.

Futures Wheel Step-by-Step Guide

1. **Defining the central trend or event** – Whether working in a group or individually, start by selecting a clearly defined trend, issue, or event. This will serve as the centre of your Futures Wheel, written in a large circle in the middle of your working space.
2. **Primary impacts** – Next, draw lines radiating outward from the central circle to create short wheel-like spokes. Along each spoke, identify and write the most direct first-order impacts of the central event in individual circles.
3. **Secondary impacts** – For each first-order impact explored, identify the second-order impacts or potential outcomes. Draw these as circles around the first-order circles and connect them via spokes.
4. **Third-order impacts** – Continue this process to identify third-order impacts, attaching them via spokes to the previous level circles. You may continue this process for as many levels as you think are relevant or useful to explore. However, completing the exercise up to third-order implications are usually sufficient to explore a wide range of possible future implications.
5. **Sorting outputs** – Once your Futures Wheel is completed, spend some time analyzing and assessing the likelihood of the identified impacts. Consider removing less plausible or highlighting high-impact ones based on your assessment.
6. **Refining the Futures Wheel** – Review and refine your Futures Wheel as new information becomes available, as circumstances change, or based on participant discussions.
7. **Iterating on the Futures Wheel** – Starting from the beginning, consider how a slightly different trend or event may change the output, or consider the extreme opposite. Compare this Futures Wheel to your first one and identify what remains the same and what is different.

Futures Wheel

When using the Futures Wheel, select a clearly defined trend or event and draw lines radiating outwards. At the end of each line, identify the most direct first-order impact of the central trend/event. Then, from each first-order impact, draw a line to write the second-order impact or potential outcomes. Continue this process for as many levels as you think are necessary.

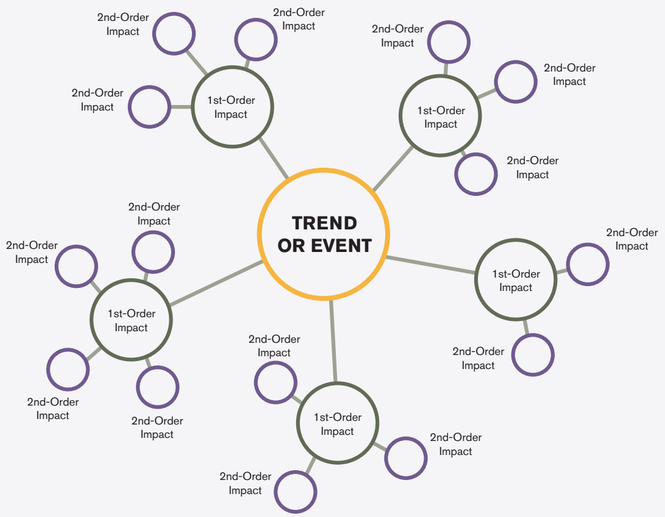

Figure 2
A Futures Wheel as described by Jerome C. Glenn. Adapted from "Futures Wheel." Wikipedia (2024, January 16). https://en.wikipedia.org/wiki/Futures_wheel. CC BY 2.5..

Why use the Futures Wheel

This tool allows both foresight experts and those new to the field to explore potential impact on the future and map the consequences in a visual way. It can be used to explore possible implications of a specific event. By continuously branching out, the Futures Wheel details layers of interrelated consequences, offering insights into the complex interrelationship between events and outcomes. Through this tool, organizations can analyze the likelihood and potential impact of each consequence, which aids informed decision making and strategic planning.

Those who are more familiar with foresight tools can apply different variations of the Futures Wheel. One alternative version separates impacts into STEEPV factors, where one quadrant of the wheel may be dedicated to economic impacts, one political, etc. Another variation of the Futures Wheel adds the dimension of historic force, current correlations and future implications. This version is more complex and requires more time to complete, and is often better represented by using a three-dimensional graphical software that is capable of visual rotation.

Future Wheels can also be used to add depth and believability to future scenarios. Participants can select an event from their scenario to explore and place it at the centre of the Futures Wheel. Participants can then identify first, second, and third-order impacts to reveal consequences of the change central to the scenario. These consequences can then be added to the scenario to create complexity and make the scenario more believable.

When to use the Futures Wheel

The Futures Wheel is useful in challenging and assessing a potential course of action or operation to imagine the potential unintended second and third order consequences that can complement standard red teaming exercises.

The Futures Wheel is a highly effective tool for defence and security practitioners as it provides a method for mapping the ways in which the security landscape may evolve in relation to a specific change. Its utility in challenging and assessing a potential course of action or operation to imagine the potential unintended second and third order consequences can complement standard red teaming exercises. In this way, it is particularly useful for anticipating and strategizing for potential future threats, challenges, and opportunities. At the strategic level, it can be employed to think through the consequences of geopolitical trends, economic developments, and emerging technologies to reveal their indirect impacts that could pose security risks.

FUTURES WHEEL
CASE STUDY

Trend One

TREND ONE

Trend One, a foresight consultancy company, produced a Futures Wheel to identify potential future consequences of Russia's war in Ukraine. Surrounding the main event, the exercise identifies eight primary effects of the war, followed by secondary and tertiary impacts in the two outer layers. The three levels are connected using cause and effect lines, illustrating the relationships between the effects. Trend One has modified the Futures Wheel in their report to identify how the war influences macro trends to help organizations prepare for anticipated changes, opportunities, and risks resulting from the war.

To read more about TrendONE's future wheel on Russia's war in Ukraine see:
https://www.trendone.com/en/turning-point

3

TOOL 3

Three Horizons

TYPE: Normative | Exploratory

DIFFICULTY: Introductory | Intermediate | Advanced

TIME: 1 Hour | Half Day | 1 Day | Ongoing

Overview

Originally developed by Bill Sharpe, the Three Horizons model is a foresight tool used to visualize present assumptions, evolving changes, and desired futures while retaining important and successful features from the present. The model aims to portray the intersecting waves of innovation and change and balance short-term goals with long-term vision. It consists of three horizons, each representing a different time frame and focus:

- *Horizon 1 (H1):* The first horizon describes the current situation, emphasizing what is already known. Short-term goals and immediate concerns are the primary focus of this horizon, as changing conditions and future uncertainties may begin indicating that the 'status quo' is generating diminishing returns on present-day efforts. It is helpful to consider incremental change, current assumptions, or existing traditions in this horizon.
  (Timeframe: 0 to 5 years)
- *Horizon 2 (H2):* The second horizon highlights activities and developments that can lead to new possibilities or future disruptions. Some changes here will further entrench ideas described in the H1, whereas others will usher in the transformations in H3. Overall, the focus is on preparing for changes and developments on a medium-term scale.
  (Timeframe: 5 to 10 years)
- *Horizon 3 (H3):* The third horizon focuses on the emerging changes and transformative ideas that have the potential to revolutionize organizations and eventually replace the 'business as usual' conditions of H1. These preferred and possible futures tend to focus on transformative shifts rather than incremental changes, current assumptions, or existing traditions. This horizon involves long-term thinking and helps anticipate future trends and uncertainties.
  (Timeframe: 10+ years).

Strength: Three Horizons provides a comprehensive framework for strategic planning, innovation, and consensus-building.

Weakness: The process benefits from a facilitator with a comprehensive understanding of the tool and some knowledge of foresight.

Facilitator: Works best with an experienced facilitator.

Participants: 5+ people. This tool works well with diverse professionals and experts from the field of inquiry. With larger groups consider breaking into smaller groups of 3-8 participants.

Timescale: 0 to 20 years. Three Horizons is ideal for exploring the near to mid-term future.

Inputs: Horizon 1 requires "on the ground" knowledge of how things currently operate and works well with Strengths, Weaknesses, Opportunities, Threats (SWOT) framework. Horizon 2 requires knowledge of similar situations and how others are tackling similar challenges. Case studies work well here, Horizon Scanning can be used to find emerging trends, or Backcasting can be used to project from the idealized future to the present day. Horizon 3 requires creative visions of the future from participants who have "skin in the game" and works well with narrative scenarios, storytelling, and visual representations of the future. You might consider complementing this with using AI to generate compelling images or stories of the ideal future.

Outputs: An idealized future vision with some initial ideas of how to get there from the present. This output is ideal for further strategy and implementation planning.

Three Horizons Step-by-Step Guide

1	**Prepare the workspace** – The Three Horizons requires a large and collaborative workspace, whether in person or online. Prepare your materials and workspace in advance: draw the 3H framework for participants to fill in.
2	**Illustrate the process** – Provide an overview of the activity to participants, explaining each horizon and topic of interest or issue you are working on. Ensure all participants understand the purpose and main functions of this tool. Focus on highlighting the inputs and the outcomes to help make sure the group is aligned.
3	**Group participants** – Divide participants into subgroups of 3-8 people, if necessary.
4	**Horizon 1** – Exploring the current situation, start filling in H1. Some key prompting questions might include: What is the status quo? What is being taken for granted? How are things done today? What are challenges in the present?
5	**Horizon 3** – Describe long-term visionary aspirations and desired end state. Some key prompting questions might include: What transformational shifts need to take place? What is the ideal vision? How would things operate differently if ideal conditions were met?
6	**Horizon 3 in the present** – Identify glimpses of the future that exist today. Some questions from prompting might include: What exciting new paradigms are emerging? What are visionary leaders saying? Where are examples of the desired future already in practice?

Create a wall-sized poster of this framework to guide a workshop where participants place sticky notes or digital equivalent on the chart. Each sticky note will have one idea written on it, which are then placed under the appropriate categories.

Three Horizons

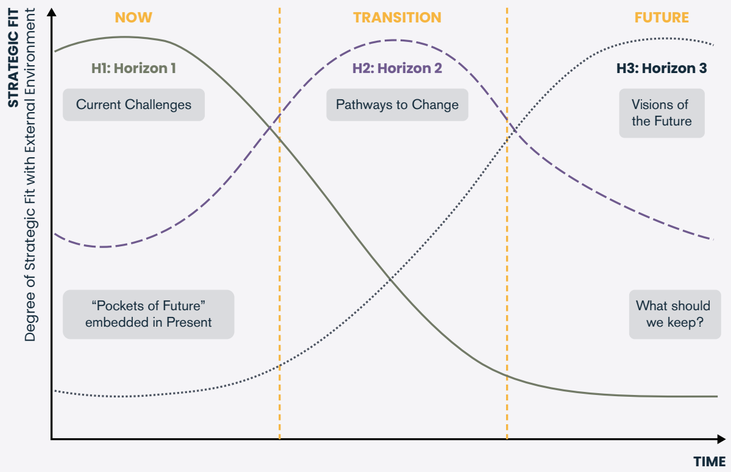

Figure 3
Three Horizons: International Training Centre of the ILO. (n.d.). Foresight: The three horizons framework [PDF file]. https://training.itcilo.org/delta/Foresight/3-Horizons.pdf

7	**Horizon 2** – Identify emerging changes and disruptive technologies or behaviours. Some key prompting questions: What parts of the status quo are being challenged? What activities are most vulnerable to change? What are some necessary changes to get to H3? What practices could we adapt to jump start change?
8	**Horizon 1 in the future** – Return to what you wrote under Horizon 1 and consider which aspects of the present day are worth preserving. Are there traditions that are worth holding onto? Are there fundamental, character defining activities that should be continued?
9	**Reflect** – Have groups reflect on what they've come up with and fill in any blanks. Some key prompting questions: Which parts of H1 should we discard? What parts of H2 offer the most promising and actionable opportunities? Which parts of H3 are in tension with one another?
10	**Discuss** – Take some time to debrief and share each group's learnings with the larger group. Discuss your next steps and how you can leverage the findings and reflections from this exercise to nurture your organization's future. This step is key in realizing the most benefit from Three Horizons and moving forward.

Why use Three Horizons

The Three Horizons tool stands out for its conceptual versatility and its applicability across broad timescales. Its effectiveness lies in visualizing three distinct horizons, each serving different purposes and featuring unique characteristics. Participants can overlay situation-specific information onto these horizons in order to gain insights into potential futures.

The Three Horizons exercise allows participants with limited experience with foresight to meaningfully contribute to the activity.

The multi-layered aspects of the tool allows participants with limited or introductory foresight experience to contribute in a way that enables them to negotiate complex understandings of change while connecting these concepts to their specific situations and challenges. Compared to more conceptual tools and frameworks, Three Horizons allows for more intuitive approaches without relying on a specific method to explain and validate knowledge. This allows participants with limited experience with foresight to meaningfully contribute to the activity.

Additionally, the tool can be highly valuable as a ‘scoping tool’ to highlight and frame key issues and unknowns at the beginning of a project. While the Three Horizons tool excels in this scoping capacity, it can also complement more conceptual tools like scenario planning and systems mapping. By combining these tools, participants can develop deeper insights into critical uncertainties and relationships between changes identified in the second and third horizons.

When to use Three Horizons

This flexible tool can be used to help you achieve balance between the need for innovation with enduring operational requirements. It can be used to create a holistic view that considers both short-term security concerns and long-term strategic goals. Importantly, by linking the current situation to a desired end-state, it can inform decisions about what activities or capabilities can be divested, thereby allowing resources to be focused on priority objectives. It helps to build team alignment by envisioning common future goals. It can also be used to identify potential disruptions early on to ensure adaptability to changing threats.

The Three Horizons foresight tool is useful in defence and security settings because it provides a framework to examine the current state of affairs, explore emerging changes and identify their potential short and long-term impacts.

The Three Horizons foresight tool is useful in defence and security settings because it provides a framework to examine the current state of affairs, explore emerging changes and identify their potential short and long-term impacts. Decision makers can use Horizon 1 to assess existing technologies and capabilities, operational activities, organizational structures, planning strategies, and geopolitical conditions, and to deepen their understanding of the current landscape. Horizon 3 allows the organization to focus on long-term strategic planning and can help decision makers invest in research and development, and stay ahead of potential risks and challenges that may arise in the distant future. Horizon 2 can help decision makers explore novel approaches, identify emerging new technologies and capabilities or improve training programs.

THREE HORIZONS
CASE STUDY

The UK Government Office for Science and Technology

Government
Office for Science

The UK Government Office for Science and Technology incorporated the Three Horizons framework into its 'Futures Toolkit' to enhance strategic planning and policymaking across the government. By applying Three Horizons, policymakers balance short-term goals with long-term visions, explore various scenarios, and link complex changes to policy objectives. For example, the UK government used Three Horizons in designing and implementing 'Intelligent Infrastructure Systems', an £8bn/year investment in the UK's transport infrastructure. Three Horizons was used in this case to address issues of climate change and other external shocks to ensure that infrastructure projects were resilient enough to withstand the next 50 years.

To read more about the Intelligent Infrastructure Futures, see the report:
https://www.gov.uk/government/publications/intelligent-infrastructure-futures

4

TOOL 4

Futures Triangle

TYPE: Normative | Exploratory

DIFFICULTY: Introductory | Intermediate | Advanced

TIME: 1 Hour | Half Day | 1 Day | Ongoing

Overview

The Futures Triangle, developed by futurist Sohail Inayatullah, is a framework for mapping how future visions, present drivers and trends, barriers and other influences from the past interact to form possible futures. By mapping the past, present and future, the Futures Triangle provides an ideal starting point for foresight exercises and helps to navigate strategy and policy-making methods towards or away from possible futures.

- *Pull of the Future:* The top of the triangle describes a desired vision of the future.
- *Push of the Present:* The bottom left encompasses current drivers of change.
- *Weight of the Past:* The bottom right of the triangle represents historical narratives, systemic barriers and resistance to change.

The Futures Triangle has limited utility as a standalone tool and is best used in conjunction with other tools.

Strength: This tool can produce outputs very quickly depending on the number of variables used. This tool provides an accessible framework that can be iterated and contrasted to capture differing scales of complexity. For example, multiple Futures Triangles can be created to compare different futures.

Weakness: The tool's distinctions between past, present and future can fail to represent the non-linear character of events. At the same time, large-scale historical processes such as globalization may be relevant to all three points of the triangle. The tool has limited utility as a standalone tool and is best used in conjunction with other tools.

Facilitator: This tool requires very little facilitation.

Participants: 1 to 3 people. The tool can be used by a small working group or individual.

Timescale: 5 to 20 years. This tool is best used to address futures in the near to midterm. Using this tool to look 20+ years into the future is liable to become too far removed from the past and present contexts. Other tools are better suited for long term future thinking.

Inputs: The Futures Triangle requires understanding of current contexts, knowledge of the past, and an understanding of present drivers, structures, and barriers. This tool can be used as a stand-alone exercise but benefits from the inputs developed from a Horizon Scanning, Scenario-Building or Causal Layered Analysis exercise.

Outputs: The Futures Triangle maps out past, present, and future forces. It identifies areas of convergence and divergence, and allows users to develop a better contextual understanding of where behaviours may support or derail planning efforts or strategy implementation.

Futures Triangle Step-by-Step Guide

1. **Prepare the materials** – In a collaborative workspace, draw a triangle, with 'pull of the future' at the top corner, 'push of the present' at the bottom left, and 'weight of the past' at the bottom right.
2. **Give an overview** – Provide an overview of the activity to participants, explaining the nature of each competing corner of the triangle and the area of focus you'd like them to consider.
3. **Envision the future** – As a group, envision possibilities for the future and note them at the 'pull of the future' corner. Consider aspirational ideas, innovations, and desires for your preferred or ideal future. If helpful, you can focus on a specific facet of the future, i.e., pick one STEEPV or PMESII category and imagine how you would like to see that domain change in the future.
4. **Assessing the present** – Explore drivers and trends that are currently shaping the present to align with your preferred future and note them at the 'push of the present' corner. Reflect on what is happening now to push change forward.
5. **Analyze past influences** – Identify structures and barriers that have historically resisted change. Consider who benefits from maintaining current traditions and the status quo. Note them at the 'weight of the past' corner.
6. **Reflect on findings** – Spend some time thinking about the trajectory of past events, the current status, and future aspirations. Some prompting questions might include: Do you see a straight line between past, present and future? Do you need to course-correct on decision making? Are you looking at a transformational change to achieve the future vision? This will help inform how you strategize and develop a way forward.

Futures Triangle

To use the Futures Triangle in a workshop setting, draw a triangle with the labels as shown to the right. Place sticky notes at the corners with ideas that correspond to each category.

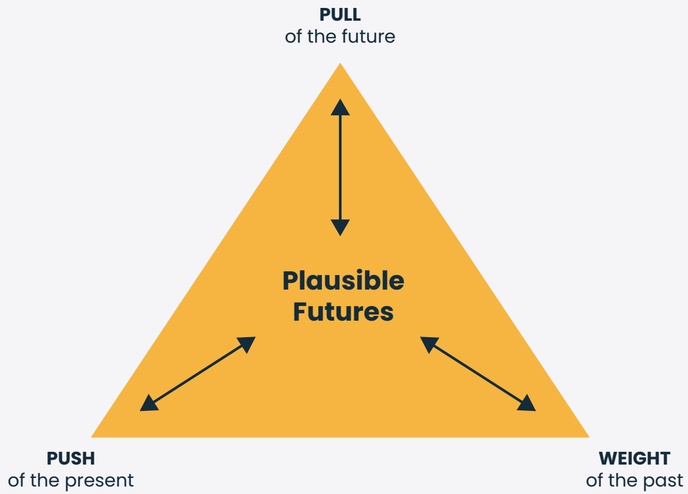

Figure 4
Futures Triangle, originally developed by Sohail Inayatullah. From "How Can We Anticipate Plausible Futures?." Futures Platform (2023, August). https://www.futuresplatform.com/blog/how-can-we-predict-plausible-futures. Copyright 2023 by Futures Platform.

The flexible nature of the Futures Wheel means that it can be completed quickly, either in small groups or individually.

Why use the Futures Triangle

As an accessible mapping exercise, Futures Triangles are ideal starting points for foresight projects. The flexible nature of the tool means that it can be completed quickly, either in small groups or individually. The Futures Triangle process can be done in a single iteration, or by constructing multiple iterations that compare different future visions.

The Futures Triangle can help you understand connections or disconnections between past, present and future. By visualizing the past, present and future, the Futures Triangle allows users to undertake a holistic consideration of complex factors shaping possible and ideal futures.

Both inputs and outputs can be deepened by introducing other tools. For example, a Horizon Scanning exercise can be used to identify drivers and trends of change that may influence how you view the "pull of the future." Or a Causal Layered Analysis can complement a Futures Triangle exercise by revealing a deeper understanding of the present context.

When to use the Futures Triangle

The Futures Triangle is useful in defence and security contexts for visualizing how past and present drivers and barriers to change relate to future possibilities and organizational aspirations. Decision-makers can use the Futures Triangle to conceptualize gaps between the present context and future aspirations, and to identify the level of change required to achieve their organization's vision of the future.

Defence and security professionals can use this tool to better understand how possible, ideal and undesirable futures may occur based on the interlinked relationships between past, present and future. A Futures Triangle exercise can be useful for informing strategy and policy initiatives that work towards realizing or averting potential futures. Futures Triangle is of particular benefit for Defence and Security organizations in exploring potential barriers and accelerators to culture change.

FUTURES TRIANGLE
CASE STUDY

Australian Government
Department of Defence

The Centre for Military and Veterans' Health

The Centre for Military and Veterans' Health in Australia used the Futures Triangle to identify areas of contradiction, synergy and disconnection between various factors, such as technology-smart prevention and new models of healthcare, that had the potential to impact their mandate or delivery of services. Participants paired outputs from the Futures Triangle with a Causal Layered Analysis to systemically understand critical issues. Finally, participants completed a Horizon Scanning activity to track critical issues revealed through the Futures Triangle and Causal Layered Analysis. The outputs of the process were used to inform strategies and policy initiatives to maintain a healthy military force, pre-empt illness, and foster ideal future operating environments for defence and security professionals from a health perspective.

To read more about The Centre for Military and Veterans' Health, Australia: https://www.researchgate.net/publication/237425569_A_Layered_Approach_to_Horizon_Scanning_Identifying_Future_Issues_in_Military_and_Veterans'_Health

5

TOOL 5

Causal Layered Analysis (CLA)

TYPE: Normative | **Exploratory**

DIFFICULTY: Introductory | Intermediate | **Advanced**

TIME: 1 Hour | **Half Day** | **1 Day** | Ongoing

Overview

Causal Layered Analysis (CLA) is a foresight technique used to deconstruct dominant understandings of the present in order to allow for alternative perspectives on the future. CLA uses four layers of analysis to facilitate this.

- *Litany:* The first layer is the litany, which describes the obvious indicators of a situation or event.
- *Systems:* The second layer identifies the systemic factors of the litany.
- *Worldview:* The third layer is the worldview layer which identifies underlying assumptions, beliefs and values which enable the systemic factors to persist.
- *Metaphor:* Fourth is the metaphor layer (also called the myth layer), the deeper unconscious and often emotive dimension that underlies the previous layers.

CLA can be imagined as an iceberg with the litany being the visible tip of the iceberg. The layers beneath the litany are submerged under the ocean and are therefore less visible.

CLA can be imagined as an iceberg with the litany being the visible tip of the iceberg. The layers beneath the litany are submerged under the ocean and are therefore less visible. It is worth noting that each layer corresponds to a distinct timescale. The litany is continually changing based on day-to-day events, systemic factors evolve over several years, worldviews span decades, and metaphors endure across generations.

Strength: This tool allows practitioners to examine deep structures of meaning by identifying how values and metaphors shape the world. People who like to understand how things work and who are inclined to explore different perspectives will find this tool easier to use.

Weakness: The tool can lead to a paralysis of action if participants spend too long problematizing rather than developing a strategy from the outputs. If you prefer sticking to practical, observable facts and are unaccustomed to dealing with multiple viewpoints on reality, you might find this tool challenging to use.

Facilitator: The process can be supported by a facilitator familiar with the CLA language and who has previous experience using the tool or with other foresight methods, especially with a group unfamiliar working with multiple viewpoints that may question their own view of reality.

Participants: 5+ people. This tool works well with a diverse and multidisciplinary group of professionals. With larger groups consider breaking into smaller groups of 3-8 participants. Timescale: 0 to 50 years. The method incorporates timescales ranging from the present day to the far future.

Inputs: A CLA exercise begins at the litany level, which requires key data points and facts that describe the current state of the issue or problem area to be explored.

Outputs: A CLA produces a deeper level of understanding of a problem area, providing insights into the values driving behaviours and actions. Outputs can inform scenarios and strategies for addressing the issue from multiple perspectives. These outputs can also suggest systemic level interventions or levers of change that can be useful for developing strategies and implementation plans.

Causal Layered Analysis Step-by-Step Guide (Part 1)

1	**Prepare the materials** – In a collaborative workspace, draw an iceberg divided into four horizontal layers.
2	**Overview** – Provide an overview of the activity to participants, explaining that the exercise begins by exploring the current situation, working your way down through the layers of the iceberg in sequence from top to bottom.
3	**Capture the obvious** – Begin the exercise by brainstorming about the litany—the current events, news headlines, trending topics—related to your area of interest. Capture the ideas in the top layer of the diagram.
4	**Analyze systemic factors** – Identify the systemic structures that enable events at the litany level to occur. This is an opportunity to unpack underlying problems or power structures that produce the litany. Note down these ideas in the system level of the diagram second from the top. It can be helpful to draw connecting lines from one layer to another between closely related ideas as you go.
5	**Identify supporting worldviews** – Reflect on the worldviews and discourses that allow the current systems to persist. The worldview level requires an understanding of the values and behaviours that enable those systemic processes to occur. Write these down in the worldviews level of the diagram. It is common to have less ideas on each subsequent layer as the tool naturally forces you to synthesize ideas from the previous layer.
6	**Uncover the metaphor** – The metaphor should be a concise and descriptive phrase that would reinforce the identified worldviews. Ideally, you want to come up with one uniting metaphor for all the ideas explored. If you have competing metaphors, it can be helpful to move each one (and the related ideas from all layers) onto a separate CLA.

Note: If you are aiming to understand the causes of the current situation, you may choose to end the exercise here. If you are exploring an alternative future, proceed to part 2.

Iceberg Model of Causal Layered Analysis (CLA)

Use this diagram as a wall chart or digital equivalent. Draw an iceberg divided into four horizontal layers. Begin by brainstorming and writing ideas on sticky notes that belong to each layer starting from the top to the bottom. Place sticky notes in their corresponding layer.

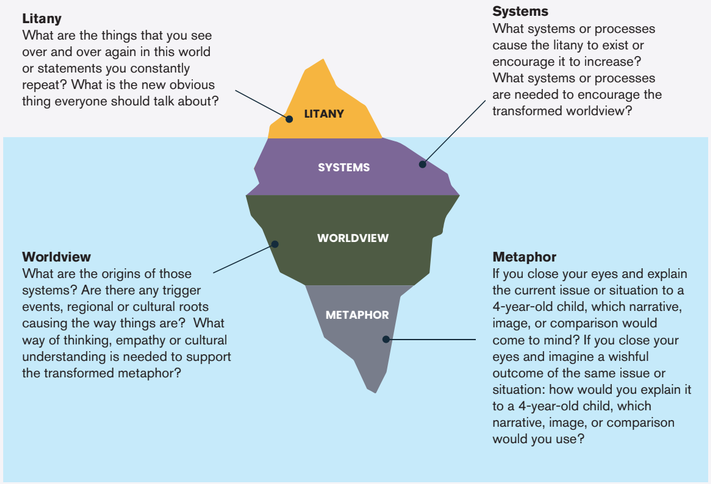

Figure 5
Iceberg model and structure of a CLA. Adapted from "Horizon scanning tips and tricks: A practical guide." European Environment Information and Observation Network. (2023). https://www.eea.europa.eu/publications/horizon-scanning-tips#:~:text=Horizon%20scanning%20%2D%20a%20foresight%20method,future%20shocks%20and%20reduce%20uncertainty. Copyright 2023 by European Environment Agency, 2023.

Causal Layered Analysis Step-by-Step Guide (Part 2)

7	**Think about an alternative future** – Once the CLA template exploring the current situation is complete, shift to thinking about an alternative future. Using a blank CLA template, you will work your way back up through the layers to explore an alternative to the current situation.
8	**Create a new metaphor** – The second half of this exercise begins with a creative vision. Ask participants to invent a new metaphor to guide your CLA towards an alternative future.
9	**Identify supporting worldviews** – Identify the worldviews and narratives that would follow from this new metaphor and consider dominant cultural influences, ideologies, and beliefs that would be likely to emerge.
10	**Analyze systemic factors** – Explore the systemic drivers that would arise from the new dominant worldview. Use your understanding of current systems developed in the previous phases of the exercise to envision systemic changes that could support your alternative future.
11	**Imagine the litany** – Describe the litany of your alternative future. You can do this by sketching the front page of an imaginary newspaper, inventing quantitative data that aligns with this alternative vision of the future, etc. Essentially, you are crafting the day-to-day experience of an alternate situation.
12	**Compare layers** – If multiple groups of participants conducted their own CLA, you can compare the layers and discuss the differences and similarities.
13	**Discuss** – Engage in group discussion on any questions, observations, or insights that follow from the CLA exercise. What new strategies should be employed to reach the alternative future? Which stakeholders will resist?

Why use Causal Layered Analysis

CLA helps users identify and understand an organization's values and belief systems, and enables users to visualize deep changes that could encourage sustainable progression towards a desired alternative future.

CLA's advantage lies in the tool's ability to surface underlying assumptions and deep beliefs that inform dominant perspectives on pivotal topics, allowing for differing understandings of the same issue to emerge. The tool delves into deeper levels of meaning than most other foresight tools, as most tools in this handbook focus on the litany and systemic levels. CLA encourages participants to question unconscious worldviews and metaphors that inform possible futures. CLA helps users identify and understand an organization's values and belief systems, and enables users to visualize deep changes that could encourage sustainable progression towards a desired alternative future. For example, its application in understanding and analyzing organizational culture can be used to inform the development of a culture change program.

While the foresight application of this tool has participants explore existing systems before imagining alternative futures, the tool is often used solely as a systems thinking tool. To use it in this way, participants would only follow the CLA process once, working through steps 1-6.

When to use Causal Layered Analysis

By understanding the underlying systemic and semantic structures that make events and issues intelligible or actionable, defence and security practitioners can address issues at their source rather than merely addressing symptoms.

CLA can be used to enable the creation of inclusive and effective planning, decision-making, and communication strategies. It does this by allowing security and defence professionals to explore deep layers of causation that might influence security dynamics and identify multiple perspectives on a potential future security environment. By understanding the underlying systemic and semantic structures that make events and issues intelligible or actionable, defence and security practitioners can address issues at their source rather than merely addressing symptoms. It can also provide new metaphors and worldviews that can be embedded within a system to encourage systemic or cultural change in line with future-oriented goals. The worldview layer of CLA, for example, allows for an examination of cultural and ideological factors influencing security perceptions and behaviours. The metaphor layer of CLA helps when analyzing the narratives and stories surrounding security issues.

Understanding these various layers and resulting narratives can provide insights into public perceptions, potential sources of conflict, and opportunities for building trust or cooperation. This level of depth is valuable for crafting strategies that are culturally sensitive and resonate with diverse audiences. Furthermore, it enables defence and security communicators to tailor their messages to address the specific concerns of stakeholders or impacted groups, leading to more effective communication strategies.

CAUSAL LAYERED ANALYSIS CASE STUDY

The Journal of Futures Studies

Journal of Futures Studies

The Journal of Futures Studies conducted a Causal Layered Analysis centred on autonomous weapons systems. The tool was used to explore two viewpoints: those of military stakeholders and campaigners against 'killer robots'. Using CLA, the journal was able to identify different myths that the opposing camps had adopted regarding autonomous weapons systems and trace how those myths influenced their worldview, systemic understandings and the facts they presented. The report concluded by suggesting an alternative future which united these two perspectives. It imagined that autonomous weapons systems became futurists themselves. In this future, the robot analyzed how its actions on the battlefield could have long-term political and strategic impacts for the nations deploying it, which would be factored into its operational decision making.

To read more see the journal article Autonomous Weapons Systems: Using Causal Layered Analysis to Unpack AWS: https://jfsdigital.org/2022-2/vol-26-no-4-june-2022/autonomous-weapons-systems-using-causal-layered-analysis-to-unpack-aws/

6

TOOL 6

2x2 Matrix

TYPE:	Normative	Exploratory		
DIFFICULTY:	Introductory	Intermediate	Advanced	
TIME:	1 Hour	Half Day	1 Day	Ongoing

Overview

The 2x2 matrix was first developed by Pierre Wack for Royal Dutch Shell in the 1970s and articulated as a foresight tool by Peter Schwartz. Schwartz's version of the tool is a framework used to conceptualize the interaction of two high-impact future extremes, which are called critical uncertainties, through the development of four distinct scenarios. The 2x2 matrix consists of four quadrants defined by two intersecting axes, each of which represents a condition reflecting a high-impact, highly-uncertain driving force.

- *Critical uncertainties:* In a 2x2 matrix, critical uncertainties are the key factors that are both pivotal and highly unpredictable, and that would significantly influence the future of the domain being explored. To put it simply, critical uncertainties identify the big questions or variables where the eventual outcome is unclear, but where that outcome will have a major impact on strategies, policies and outcomes in that realm. Once you have identified two critical uncertainties, their opposing conditions should be stated (e.g., if the uncertainty is China's global influence, the opposing conditions are increasing influence and decreasing influence).These pairs then serve as the defining axes for generating scenarios.
- *Scenarios:* Scenarios are narrative descriptions of possible futures, not predictions. The 2x2 method enables users to generate scenarios using the paired characteristics of critical uncertainties as differentiating features for understanding how conditions might develop in the future.

Strength: This tool is best suited to produce divergent visions of future possibilities on a clearly defined topic but where the direction of driving forces for change is uncertain (e.g., will China's global influence continue to increase or will it decrease?).

Weakness: This tool is designed to limit exploration to the interaction between two uncertainties. It produces a bounded exploration of scenarios to understand extreme possibilities and interactions of those two variables. Therefore, this tool is not well suited for broad exploration of futures because of the constraints imposed by the selected variables.

Facilitator: An experienced facilitator can be helpful in setting the parameters of the workshop. Ideally, they would ensure the scenarios the participants generate will explore meaningful future possibilities. Depending on the size of the group and the level of guidance needed, multiple facilitators may be required.

Participants: 3 to 12 people. Larger groups are ideal because they can be subdivided into four smaller groups that can each tackle a quadrant of the 2x2 matrix. Groups exceeding 12 participants should work on multiple iterations of the 2x2 matrix with support from multiple facilitators. A diverse group with a range of expertise and experience is best. Participants should have prior knowledge of the subject matter (i.e., the areas of uncertainty to be explored) to ensure they generate credible scenarios.

Timescale: 5 to 20 years. The 2x2 Matrix is most relevant to the mid-term future. The timescale will depend on how long it takes for significant changes related to the critical uncertainties to have a meaningful impact. It becomes more difficult to accurately determine critical uncertainties when dealing with time frames longer than 20 years.

Inputs: A Horizon Scanning exercise can be helpful for identifying high-impact and uncertain driving forces that can then be used to inform the critical uncertainties as variables.

Outputs: The tool generates highly-relevant divergent scenarios that allow users to explore possible future operating environments and problems, which can in turn be used to develop strategies that help identify risks, vulnerabilities and possible solutions.

2x2 Matrix Step-by-Step Guide

1	**Prepare the materials** – In a collaborative workspace, draw two intersecting lines to create four quadrants.
2	**Give an overview** – Provide an overview of the activity to participants, explaining how the axes describe each quadrant.
3	**Describe the critical uncertainties** – Identify the high-impact, high-uncertainty driving forces to determine the two critical uncertainties relevant to the research topic. Use one critical uncertainty to label the x axis of the 2x2 diagram, and the other to label the y axis. These two axes represent a spectrum of possibilities with opposing extremes at each end.
4	**Create the big picture** – Working through each quadrant, generate possible scenarios based on the ends of the spectrum that define that quadrant. Consider what the future environment would look like within the parameters of the axes, assessing how each STEEPV or PMESII category would operate within the quadrant.
5	**Add details and create believability** – Brainstorm initial scenario narratives, details and key characteristics.
6	**Reflect** – As a group, reflect on each of the scenarios and discuss positives or negatives, surprising elements, wider implications, and next steps.

2x2 Matrix

What is a Scenario? Scenarios are narrative descriptions of possible futures, not predictions.

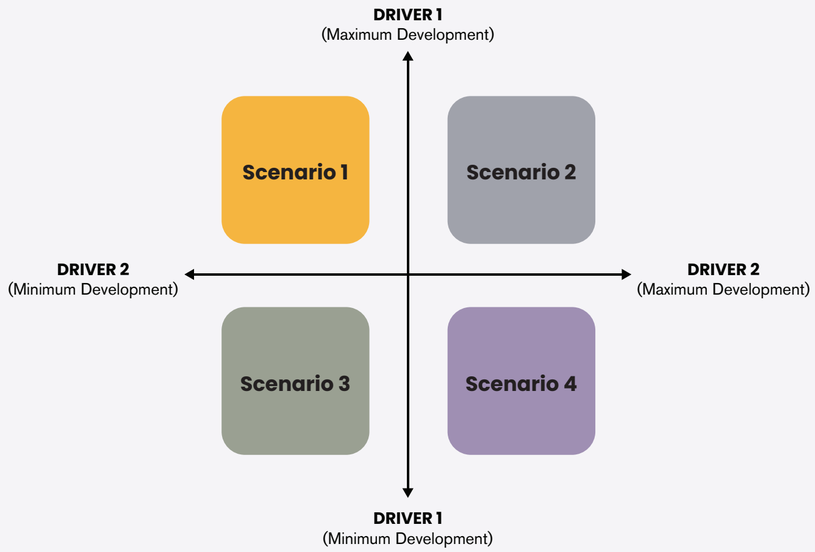

Figure 6
2x2 Matrix: Rhydderch, A. (2017). Scenario Building: The 2x2 Matrix Technique. Futuribles International. https://www.researchgate.net/publication/331564544_Scenario_Building_The_2x2_Matrix_Technique

Why use the 2x2 Matrix

The four scenarios often resemble the following archetypes: optimistic, pessimistic, innovative or exploratory. Innovative scenario archetypes may gravitate towards an unexpected event. Pessimistic archetypes may result in a scenario that is out of balance by emphasizing damaging impacts that spiral out of control. Using this tool to create scenarios encourages decision-makers to consider a wide range of possibilities for the future by engaging their imagination.

The 2x2 Matrix is ideal for building upon exercises like Horizon Scanning. As a creative method for exploring future possibilities, the 2x2 Matrix complements conceptual tools like scenario planning and analysis, or systems mapping. It's particularly useful for testing the implications, usefulness and significance of key drivers of change and critical uncertainties.

Another potential use for Defence and Security of the 2x2 Matrix is as a diagnostic or red-teaming tool to examine the relative weight or focus of different "lines of operations" (LOOs) or "lines of effort" (LOEs). It could be used to help visualize various outcomes based on the quadrants as different lines of effort progress. This analysis can help determine which lines of effort should be prioritized and identify key indicators to monitor as "measures of effectiveness" for each line of effort in the 2x2 Matrix. Additionally, it can be valuable for understanding how different lines of effort interact.

When to use the 2x2 Matrix

Generating scenarios allows users to push their thinking on topics further by considering potential outcomes of the interaction between two critical uncertainties.

Generating scenarios allows users to push their thinking on topics further by considering potential outcomes of the interaction between two critical uncertainties. The 2x2 Matrix can help decision makers explore novel future operating environments, potential challenges, vulnerabilities, strengths, and risks to ensure that medium to long-term policy and strategy will remain robust within various possible futures.

The 2x2 Matrix process can be repeated and updated as new information emerges to reassess the variable interaction of critical uncertainties and ensure that policy and strategy continuously adapt to the changing operating environment. The tool can also be used to test, pivot, strengthen or introduce new strategies and policies.

2X2 MATRIX
CASE STUDY

The Center for Strategic and International Studies

CSIS

In 2020, The Center for Strategic and International Studies (CSIS) used the 2x2 Matrix to develop four plausible, differentiated geopolitical scenarios in 2025-30, based on the relative power and interactions between America and China. A literature review of key geopolitical, military and technological trends, and semi-structured interviews with defence and security experts identified two critical uncertainties: the comparative influence of US and Chinese global leadership. The poles of each axis were defined as weak or strong leadership from each of the global powers. These axes generated four scenarios: a weak US and a strong China, a strong US and a strong China, a weak US and a weak China, and a strong US and a weak China. While brainstorming the initial scenario narratives, participants considered the role of other US allies and adversaries within each of the quadrants. The scenarios developed by applying the 2x2 Matrix were subsequently tested and expanded through deep trends analysis and expert interviews.

The project was designed to test policymakers' preconceived notions about major defence and security challenges facing the US and its allies. Participants identified high volatility in the China-Russia relationship and posited that military application of technology was more likely to be evolutionary than revolutionary. Using the findings, participants identified key technologies to track in order of strategic importance: conventional nuclear hypersonic weapons, autonomous systems and synthetic biology.

To read more about The Center for Strategic and International Studies' (CSIS) use of the 2x2 Matrix: https://www.csis.org/analysis/four-scenarios-geopolitical-order-2025-2030-what-will-great-power-competition-look

7

TOOL 7

Johari Window

TYPE: Normative | **Exploratory**

DIFFICULTY: Introductory | **Intermediate** | Advanced

TIME: 1 Hour | **Half Day** | 1 Day | Ongoing

The Johari Window aids participants in anticipating change and recognizing key drivers, uncertainties, threats, and vulnerabilities.

Overview

The Johari Window is a tool employing analytical techniques to identify and categorize known and unknown risks, blind spots and uncertainties. The Johari Window was originally developed by psychologists Joseph Luft and Harrington Ingham in 1955 as a tool for improving self-awareness and interpersonal communication. The adaptation of the Johari Window for foresight purposes represents a broader trend in adapting psychological and analytical frameworks to new domains such as strategic planning and future studies. The Johari Window aids participants in anticipating change and recognizing key drivers, uncertainties, threats, and vulnerabilities. Divided into four quadrants—known-knowns, known-unknowns, unknown-knowns, and unknown-unknowns—it offers valuable insights for future-focused intelligence.

- *Known-Knowns:* 'We know what we know' – This quadrant represents obvious knowledge, objective facts, and readily available data. These might include confirmed reports and data sets, established trends, and highly likely outcomes.
- *Known-Unknowns:* 'We know that there are things that we don't know' – This quadrant represents gaps in knowledge and uncertainties that we are aware of but are unable to understand how or when they will play out. For example, we know that artificial intelligence (AI) will have significant impacts on the future, but we don't yet know the nuances of how those impacts will play out.
- *Unknown-Knowns:* 'We don't know that we (can) know' – This quadrant represents knowledge that is taken for granted or knowledge that is ignored. These include things that are too familiar or close to us to perceive. For example, these might include internal or external factors that are not considered due to personal biases or assumptions.

- *Unknown-Unknowns:* 'We don't know what we don't know' – This quadrant represents true unknowns that require discovery and may be outside the scope of our imagination. These include unexpected and unforeseen outcomes that we are not aware of, resulting from the unpredictable interactions of variables. For example, these could include the sudden onset of a pandemic or a meteor hitting the earth.

Inputs: SWOT and STEEPV frameworks are helpful for revealing overlooked factors.

Strength: The Johari Window offers a visual representation of known, uncertain and unknown factors, bringing users into awareness of improbable, unconsidered and overlooked futures outside of prevalent thinking on a given topic.

Weakness: The Johari Window allows for speculative consideration of factors that might otherwise not be considered. However, this relies on the openness of participants to new ideas and can reinforce biases and subjective impressions if the participants don't fully engage in divergent thinking.

Facilitator: This tool can benefit from an experienced facilitator, whose external perspective can help identify factors that may be overlooked by participants.

Participants: 3-10 people. This tool works best with a diverse group of participants, each offering unique expertise and perspectives, who can highlight overlooked or obscure factors that others may be unaware of.

Timescale: 5 to 20 years. The Johari Window can offer insights into both short-term and mid-term timeframes. In the short term, it helps individuals understand current dynamics and improve them based on the perspectives the technique allows them to develop. In the midterm, it can contribute to strategic planning and scenario development. While PMESII may be familiar to defence and security, using a less familiar framework such as STEEPV may be more effective in eliciting new ideas.

Outputs: This tool will help you identify blindspots or gaps in knowledge by contrasting the information you have with an exploration of unknown factors. By developing scenarios through this lens, you will be able to test and expand upon existing knowledge, uncover blind spots in planning and strategy, and insightfully develop more robust future scenarios.

S Strengths
W Weakness
O Opportunities
T Threats

S Society
T Technology
E Economy
E Environment
P Politics
V Values

Johari Window Step-by-Step Guide

1	**Give an overview** – Start by defining the purpose of the exercise and what outcomes you hope to achieve. This might involve exploring potential future challenges, opportunities, or shifts in the environment.
2	**Set up your workspace** – To build the foundation, construct four quadrants (these are sometimes referred to as "windows") labelled as known-knowns, unknown-knowns, known-unknowns and unknown-unknowns.
3	**Start listing the obvious** – Begin conducting the exercise by identifying known-knowns, including verified facts, quantifiable data, and trends. Consider what is already objectively known, and employ STEEPV or SWOT analysis to illustrate how these established factors might unexpectedly influence your topic.
4	**Brainstorm knowledge gaps** – To identify known-unknowns, consider factors you are aware of but lack precise knowledge regarding their potential impact. Reflect on emerging issues and uncertainties and speculate about how they may develop or impact the future.
5	**Uncover ignored facts** – Unknown-knowns can be identified through collaboration with a range of experts and perspectives to uncover hidden trends and knowable factors. Methods such as STEEPV or SWOT analysis can be employed in this step to identify where these blind spots may exist. At this phase, participants should be encouraged to consider a broad range of factors that push beyond the assumptions that dictate their typical thinking. Asking them to imagine stepping into someone else's shoes and imagine their take on the situation can help unlock a new perspective. If this is very difficult for participants, it may be helpful to use an Empathy Map tool to do this. Links to supporting sources can be found in the Additional References section.

Johari Window

Participants should start by identifying Known-Knowns then move to the bottom quadrants leaving Unknown-Unknowns for last.

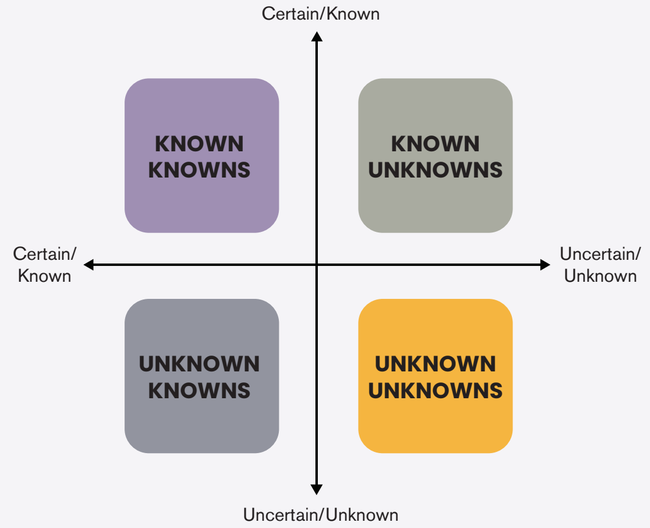

Figure 7
Johari Window: Kuosa, T. & Stucki M. (2021). Futures Intelligence: How to Turn Foresight into Action. Futures Platform. (PDF) Futures Intelligence: How to Turn Foresight into Action (researchgate.net)

6	**Get creative** – To identify unknown-unknowns, use science-fiction, prototyping or any other visionary, imaginative methods to conceptualize ideas that lay outside the scope of our imagination. Consider how various STEEPV dimensions can operate within each unknown-unknown to explore their nature and potential impact.
7	**Reflect on insights** – To conclude the exercise, reflect on the insights developed across the quadrants, including any surprises or new perspectives gained. You can use the reflection process to guide strategy making that prepares for future scenarios and capitalize on emerging opportunities.

Why use the Johari Window

The Johari Window encourages users to look beyond obvious knowledge and conditions to consider factors with varying degrees of certainty, probability and predictability.

The Johari Window encourages users to look beyond obvious knowledge and conditions to consider factors with varying degrees of certainty, probability and predictability. By visualizing known-knowns alongside various partially-known, obscure or wholly improbable factors, the tool aids in the development of robust and layered scenarios. Serving as a visual framework for scenario building and mapping, it also provides focal points for trend extrapolation, trend impact analysis, and weak signals analysis.

STEEPV and SWOT frameworks are useful throughout the exercise to assess the characteristics and impact of known and unknown risks, blind spots, and uncertainties. STEEPV analysis specifically encourages participants to extend their thinking to novel contexts, and can be leveraged to develop robust analyses that can be applied in scenario-building exercises.

When to use the Johari Window

The outputs of the Johari Window can inform the development of robust, cost-effective, future-proof policies and strategies that are resilient in the face of uncertainty.

The Johari Window embraces uncertainties and unknowns that are often overlooked or sidelined in typical strategy and planning processes. The tool addresses the unpredictable interactions of numerous factors, allowing participants to construct comprehensive scenarios which might complicate conventional thinking around strategy and policy. Moreover, the outputs of the Johari Window can inform the development of robust, cost-effective, future-proof policies and strategies that are resilient in the face of uncertainty.

The Johari Window serves as an adaptable framework for identifying potential threats, vulnerabilities, and strengths. It can help organizations that need to anticipate and prepare for risks, evaluate the resilience of current systems against unexpected events, and optimize resource allocation.

JOHARI WINDOW
CASE STUDY

“A Model for Evaluating Breach Detection Readiness”

Lead technical engineer and cybersecurity expert Shashank Dara’s blog titled “A Model for Evaluating Breach Detection Readiness” explains using the Johari Window to enhance an organization’s security posture by categorizing knowledge about security threats and vulnerabilities into four quadrants: known knowns, known unknowns, unknown knowns, and unknown unknowns. This model helps security teams to identify areas where they are aware of threats and those where they may be blind to potential risks, thus highlighting the importance of comprehensive threat intelligence and proactive vulnerability management. By expanding the ‘open area’ through continuous monitoring and sharing of information, organizations can improve their breach detection readiness, mitigate blind spots, and reduce the impact of security incidents.

To read more about Dara’s approach to cybersecurity, read his article here: https://blogs.cisco.com/security/a-model-for-evaluating-breach-detection-readiness

8

TOOL 8

Generic Images of the Future

TYPE: Normative (Exploratory)

DIFFICULTY: Introductory (Intermediate) Advanced

TIME: 1 Hour (Half Day) (1 Day) Ongoing

Overview

Generic Images of the Future, also commonly referred to as Dator's Four Futures, was developed by Jim Dator to anticipate alternative futures based on extensive cross cultural research. The tool identifies four archetypal futures that are developed through world-building exercises. Importantly, none of the four futures are intended to be overwhelmingly positive or negative. Rather, they frame a systemically coherent perspective on how the structure of that world translates into lived experiences.

- *Continued Growth:* This future scenario assumes that current trends continue along anticipated positive growth trajectories. It is characterized by development and expansion, typically featuring an ever-increasing standard of living for those who are included, technological advancements, and economic expansion. This scenario often focuses on the forward momentum of globalization, the digital revolution and other trends that drive growth while retaining a sense of potential for inequitable distribution of wealth as a consequence.
- *Decline and Collapse:* Contrary to the assumptions underlying Continued Growth, the Decline and Collapse scenario imagines a future where current systems (economic, environmental, social) cannot sustain themselves and fail. This could be due to factors like ecological disasters, economic crises, pandemics or widespread conflict. The focus here is on the vulnerabilities in current systems and the potential for sudden or gradual decline. This situation may be perceived as positive (i.e., a system no longer fit for purpose declines) or negative (i.e., a necessary system falls into crisis).

Generic Images of the Future, also commonly referred to as Dator's Four Futures, was developed by Jim Dator to anticipate alternative futures based on extensive cross-cultural research.

- *Limits and Discipline:* This future imagines a world where humans decide to proactively change their behaviours and values to limit growth. This may create a sustainable and equitable society or a more authoritarian one. It might involve strict governance or social contracts to limit consumption, protect the environment and ensure fair distribution of resources.
- *Transformation:* The Transformation future scenario envisions a profound change in human consciousness, values, and the nature of life itself. This could emerge from breakthroughs in technology (such as artificial intelligence or biotechnology), spiritual awakenings, or a radical rethinking of societal norms. This scenario is characterized by a fundamental shift in how humans interact with each other and the world.

Strength: A straightforward tool that provides a framework for constructing distinct scenarios.

Weakness: To get the most out of this tool it requires that participants have a good understanding of systemic factors to develop the most fruitful scenarios.

Facilitator: This tool can be used without an experienced facilitator, but novice practitioners may struggle with without guidance.

Participants: 1-5 people. This tool can be used by an individual or a small group, though scenario generation always benefits from the inclusion of diverse participants' perspectives.

Timescale: 15 to 50+ years. This tool is well suited for exploring mid and long term future horizons. Because each scenario archetype is defined by a paradigm shift, the tool does not work well for short term scenarios where a significant transition would be hard to describe convincingly.

Inputs: A good starting point for this tool is an understanding of the present-day status quo of the area of exploration and some investigation of trends on the horizon.

Outputs: Using the tool will result in four plausible, internally consistent and distinct scenarios which can be used to inform strategic decision making.

Generic Images of the Future Step-by-Step Guide

1	**Set up your workspace** – This tool doesn't have you fill in a chart or diagram like other tools, although it can be helpful to draw the diagram on a white board for participants to have a visual reminder to refer to while creating their scenarios.
2	**Define the scope** – Clarify the focus of the futures exploration. The focus could be an organization, a specific sector, a social, economic or environmental issue, or a combination of these. Because the rest of the tool is flexible and creative, it is important to have the scope well defined to give your participants some parameters to work within. Identify key themes - Determine the main themes or factors that will drive change within the scope. These could include technological innovations, environmental concerns, social dynamics, or economic trends. A Horizon Scan is a helpful input.
3	**Identify key themes** – Determine the main themes or factors that will drive change within the scope. These could include technological innovations, environmental concerns, social dynamics, or economic trends.

Generic Images of the Future or Dator's Four Futures Model

This diagram describes how different generic futures progress.

*There are four typical types of scenarios.

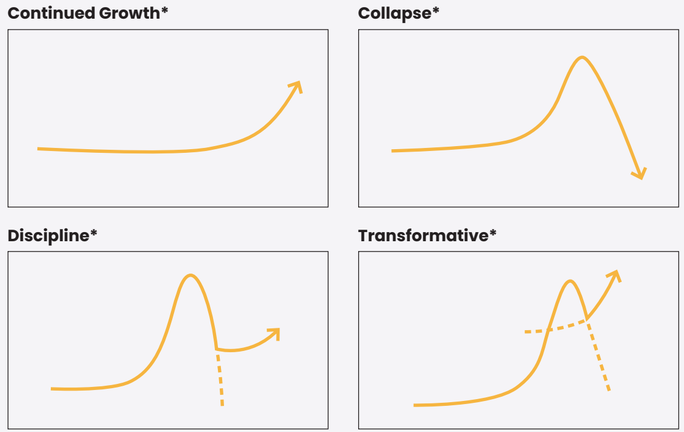

Figure 8
Inayatullah, S., Park, S., Cruz, S. O., Kaivo-oja, J., Wahi, G., Jones, C. B., Schultz, W. L., Symposium Festschrift for James A. Dator, Dunagan, J. F., Sweeney, J. A., & Inayatullah, S. (2013). Learnings from Futures Studies: Learnings from Dator. Journal of Futures Studies, 18, 2. https://jfsdigital.org/wp-content/uploads/2013/12/JFS18-2.pdf

4 **Exploring the four futures** – Engage in group discussions to explore how your key themes might evolve in each of the four scenarios. Use the following prompts as a guide for the discussion:
- *Continued Growth:* What technologies, economic trends, or social factors could fuel continued growth in the focus area? How would sustained growth affect society, the environment, or global dynamics? Which areas will experience growth and what will be the second and third order consequences? Who will be winners and losers?
- *Decline and Collapse:* Which factors could lead to a collapse? Consider environmental limits, economic bubbles, social unrest, etc. Will it be a sudden collapse, a long and slow decline, or somewhere in between? How will those stages of decline and collapse manifest? Which systems will fail first and which will be the last standing?
- *Limits and Discipline:* What changes in behaviour, policy, and technology would be necessary for a more sustainable and equitable future? How restricted will the imposed limits become and how will that manifest? How will this change the social order? Who will impose the limits?
- *Transformation:* Imagine the possibilities of significant breakthroughs or shifts and their power to influence radical change. How could emerging technologies, shifts in human consciousness, or new societal norms create a radically different future? What can you imagine about the current status quo and how it could be completely turned around?

5 **Developing scenarios** – For each future, develop a comprehensive narrative that describes what that world might look like. Include details about daily life, key stakeholders, relevant events, the "history" of how that future came to be, and your core assumptions. You can use frameworks like STEEPV or PMESII to help you explore and describe different aspects of society. Incorporate the perspectives of different stakeholders to ensure a rich and multi-faceted understanding of each potential future.

6 **Analyze the scenarios** – For each scenario, analyze the implications for your focus area. Consider both opportunities and challenges. Look for current trends or "signals" that might indicate which future is becoming more likely.

Why use Generic Images of the Future

Like other scenario tools, Generic Images of the Future encourages decision-makers to consider a wide range of possibilities for the future by engaging their imagination. Because Generic Images of the Future is useful for exploring differing scenarios in depth and contrast, the tool complements activities such as strategic planning, policy development, technology assessment and risk management. To get the most out of the tool for these purposes, it is helpful to start the exercise from the perspective of a generic image of the present. For example, you may want to consider your organization's perspective on the status quo. Starting from this point will help your organization better understand how to change and adapt to anticipate potential future outcomes.

When to use Generic Images of the Future

Defence and security practitioners can use Generic Images of the Future to identify multiple distinct alternative futures, rather than depending on a linear projection of the present into the future.

Generic Images of the Future can be a useful tool for defence and security, offering strategic insight amidst rapid geopolitical, technological, and operational changes. It aids in evaluating defence capabilities, responding to technological breakthroughs, and enhancing multi-domain operational planning. Defence and security practitioners can use this tool to identify multiple distinct alternative futures, rather than depending on a linear projection of the present into the future. By considering futures that may be less than ideal, this framework ensures defence forces are resilient and prepared for future challenges and opportunities and by integrating the tool into planning cycles, it can ensure military strategies and operations are resilient against future scenarios that resemble any of the four archetypes. It can also help in crafting policies that can endure changing geopolitics, including potential shifts in alliances, emerging security threats, and changes in technology.

You can also apply the framework to identify potential vulnerabilities and emerging threats in different future scenarios. This can inform more effective risk mitigation and resilience strategies, ensuring that defence and security organizations can maintain operational readiness in the face of unforeseen challenges.

GENERIC IMAGES OF THE FUTURE CASE STUDY

The College of Policing, United Kingdom

The College of Policing in the UK released a report using Generic Images of the Future to generate scenarios for analyzing how the policing operating environment might evolve in the coming future. The scenarios were constructed using the four archetypes: continued growth, collapse and decline, limits and discipline, and transformation. The scenarios were supplemented with data from interviews and stakeholders with key insights. The scenarios were then used at a workshop attended by police officers, crime analysts, social scientists and futurists. The participants were asked to consider which trends were likely to be the most influential in bringing any of the scenarios to pass, and what direct and indirect implications they would have for the UK's policing environment. The participants first analyzed the scenarios using STEEP. They then identified key developments and early signals such as income inequality and the proliferation of deep fake applications. This allowed the participants to extrapolate potential implications for crime and policing.

After each scenario was analyzed, the participants identified the unique and common elements of the four scenarios. Common elements included the increased use of AI and automation in most sectors which implied that emerging technologies will likely be employed to abet novel and complex crime. The identification of common elements across all scenarios allowed the policing college to prepare by investing in capabilities that could be used across a variety of future scenarios.

To read more about Policing in England and Wales Future Operating Environment 2040: https://assets.production.copweb.aws.college.police.uk/s3fs-public/2020-08/Future-Operating-Environment-2040-Part2-Scenarios.pdf

9

TOOL 9

Backcasting

TYPE: (Normative) Exploratory

DIFFICULTY: Introductory (Intermediate) Advanced

TIME: 1 Hour (Half Day) (1 Day) Ongoing

Overview

By working backward from a future vision, participants can identify the critical pathways and societal shifts necessary to bring that vision to fruition.

Backcasting foresight methods were first developed in the 1970s in the field of energy futures. John Robinson is widely credited with codifying the method, and his writings paved the way for its expansion into a broad range of fields. Backcasting enables participants to explore and shape a desired future. It begins by envisioning a compelling future state that aligns with identified values, aspirations, and understanding of emerging trends and possibilities. By working backward from this future vision, participants can identify the critical pathways and societal shifts necessary to bring that vision to fruition. This approach enables practitioners to move away from pre-existing knowledge, concepts and assumptions to anticipate futures where they may not be applicable. In a defence and security context, Backcasting can be particularly useful when desired futures can be readily described but the steps to reaching them are not easily achievable or even plausible within current circumstances and frameworks.

Strength: Participants who are comfortable with the concept of end states and are accustomed to devising ways for achieving them may find that those skills easily translate to this tool.

Weakness: Backcasting exercises typically revolve around a single future vision, with limited emphasis on exploring multiple pathways. Backcasting also relies heavily on assumptions that may be subject to change, potentially leading to vulnerabilities if other methods are not used to identify and mitigate them.

Facilitator: Backcasting exercises follow an uncomplicated structure and are therefore accessible to participants with varying levels of expertise. A facilitator is not required, but they may nevertheless enhance the process by leading discussions and guiding participants.

Participants: Backcasting is most effective when employed by small groups that have a deep understanding of the specific context being explored and of the relevant factors for realizing the desired end state.

Backcasting involves mapping the path from a desired future to the present day, requiring participants to work from a defined future vision and identify key drivers of change.

Inputs: Since Backcasting involves mapping the path from a desired future to the present day, it requires participants to work from a defined future vision and identify key drivers of change. This process benefits from elements of stakeholder engagement and analyses of the current state of affairs within the context being explored.

Outputs: The primary output of a Backcasting exercise is a future vision accompanied by a speculative timeline that maps a pathway for actualizing the desired future. This pathway which delineates sequential steps leading from the present to that future, can serve as a foundation for activities like strategy and policy development.

Backcasting Step-by-Step Guide

1	**Define the desired future** – Start by defining a specific and achievable future vision.
2	**Outline current conditions** - A good understanding of current conditions is crucial for setting up a meaningful exploration of the speculative future. In this stage, consider obstacles and opportunities emanating from the present and discuss their potential consequences.
3	**Initiate the backcast** – Starting from the desired future, work backwards towards the current conditions outlined in the previous step. A helpful approach in this process is the use of “signpost” events, which represent turning points or key drivers of change.
4	**Develop pathways** – The key here is to begin to develop more coherent pathways, similar to “lines of effort” or “lines of operations,” of how to reach the desired futures from the current vantage. Always working backwards from the future, use the “signpost” events from Step 3 as anchors and describe what happens in between. Ultimately, the pathways can be used to reverse-engineer detailed action plans to reach the end state. You may find that alternate timelines can serve to connect the envisioned future to the present day. You can track these by drawing lines connecting the sequential events of each timeline.
5	**Review and refine** – Review the progress of the Backcasting process, reassessing assumptions, updating timelines and refining strategic actions as necessary.
6	**Post-exercise analysis** – Discuss the implications of the insights uncovered through the Backcasting exercise. Walk through the events chronologically with a group external to the process to stress test your developed timelines, ideally by engaging people knowledgeable on the context. This is an opportunity to engage stakeholders and communicate the pathways and actions leading to desired outcomes.

To use Backcasting, start by outlining a clear and defined future vision and then outline the current conditions of the present. Going backwards from the future, identify steps or events that need to happen in order to get back to the present.

Components of Backcasting

Figure 9
Components of Backcasting. Adapted from "Foresight Playbook: Overview of Foresight Tools." UNDP Regional Bureau for Asia and the Pacific (2022). https://www.undp.org/asia-pacific/publications/undp-rbap-foresight-playbook. Copyright 2022 by UNDP.

While typical Backcasting exercises revolve around a single future vision, one way to address this tool's weakness is to have multiple groups develop independent backcasts.

Why use Backcasting

Outputs from Backcasting exercises serve as a way to inform forward-thinking strategies by visualizing a concrete final objective and working to identify the intermediate objectives needed to achieve it. You can also think of it as plotting the path backwards from the Final Operational Capability (FOC) to the Initial Operational Capability (IOC). By starting with the end goal in mind, Backcasting enables participants to consider a variety of strategic objectives and initiatives that could lead to its realization. This approach works by challenging current assumptions and exploring alternative visions of the future. To apply this tool, it is necessary to ground the Backasting pathways in current conditions and ensure their plausibility and coherence. Accordingly, the activity will benefit from the engagement of participants with extensive understanding of the specific context and a sense of the realistic impacts of the events signposted within the Backcasting exercise.

While typical Backcasting exercises revolve around a single future vision, one way to address this tool's weakness is to have multiple groups develop independent backcasts. You can then compare and discuss what common actions and intermediate objectives emerge across groups. You can then use these recurring objectives or actions to refine your backcasted timeline or to create a new timeline synthesized from the identified commonalities.

When to use Backcasting

Backcasting proves to be particularly effective when tackling complex, long-term issues. While Horizon Scanning and other scenario approaches are based on possibilities and better suited to contingency planning, Backcasting prioritizes problem-solving and is thus better suited to building strategies and enhancing decision making to navigate uncertainty and complexity. Furthermore, Backcasting is particularly useful when a clear vision has been proposed, but there is uncertainty around the specific and gradual steps necessary to realize it. It can also be used to facilitate alignment and coordination among stakeholders by providing a shared vision and roadmap, allowing organizations to collaborate and plan for a better future.

BACKCASTING CASE STUDY

The Finnish Defence Forces

The Finnish Defence Forces utilized a Backcasting framework when considering the impacts of future expansion conflict in the cyber domain. This exercise was held at the Finnish Defence Research Agency (FDRA) with both civilian and military experts present. The researchers used Backcasting to imagine a series of events that could explain how the future emergence of techno-economic coalitions could come to be. This future envisioned the formation of 'cyberterritories' and digital sovereignty by the nation, which led to these emergent techno-economic coalitions that would begin to challenge military alliances. From this exercise the participants used PESTEL-M framework (a framework similar to STEEPV or PMESII that explores political, economic, social, technology, environmental, legal and military categories) to analyze the trends, developments and phenomena that emerged from their Backcasting exercise. The authors argue that questions of sovereignty and 'self-sufficiency' at the national level pose critical complications to the flow of data and control exerted in cyber domains and should be considered in strategic planning of those who operate in that realm.

To read more about the The Finnish Defence Forces use of Backcasting: https://papers.academic-conferences.org/index.php/eccws/article/download/1078/1185/4412

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Safeguarding the Future
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Archipelago of Design is a non-profit organisation supporting the leading independent network of purpose driven security practitioners, educators and researchers empowering leaders to shift mindsets for the sustainable evolution of national security organizations across NATO members & partners.

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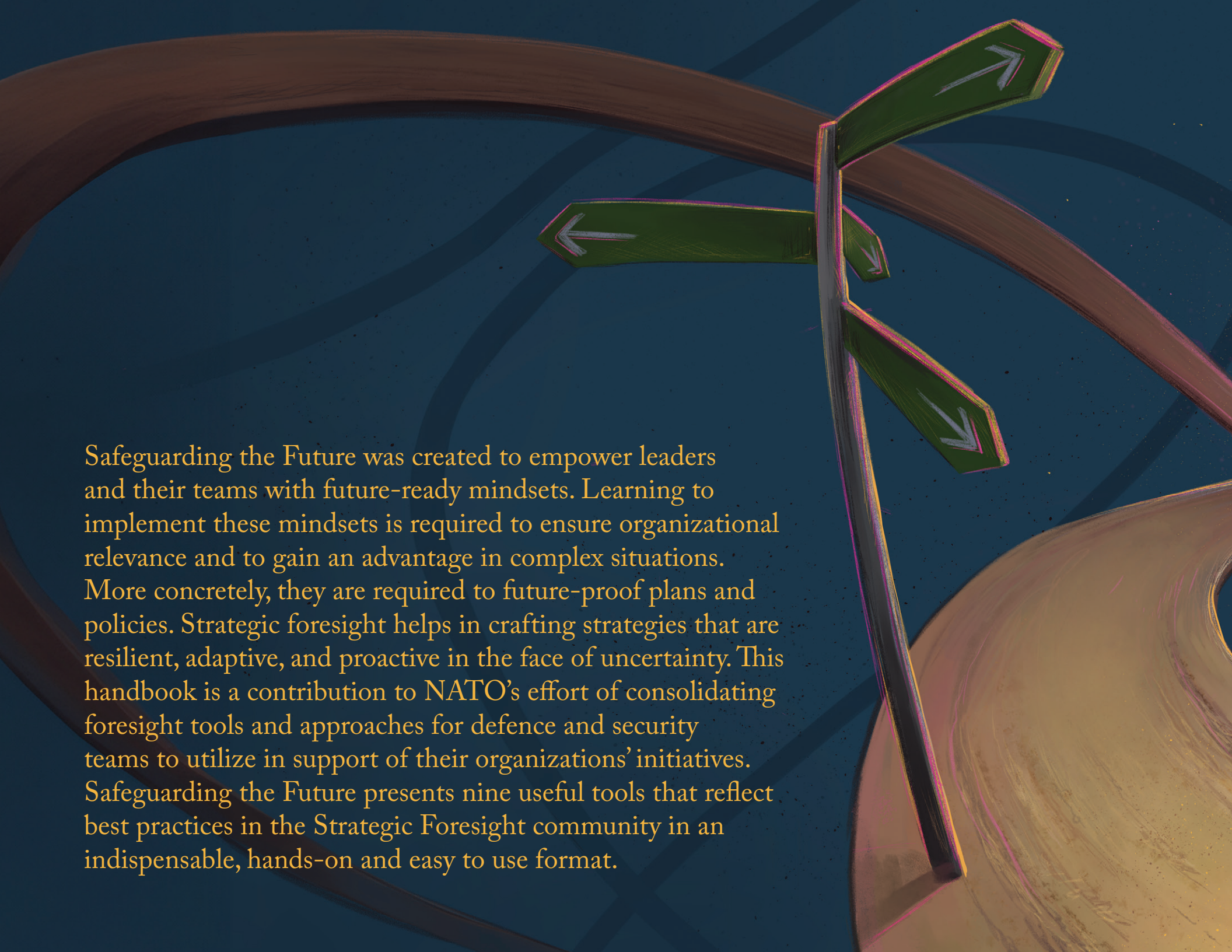

Safeguarding the Future was created to empower leaders and their teams with future-ready mindsets. Learning to implement these mindsets is required to ensure organizational relevance and to gain an advantage in complex situations. More concretely, they are required to future-proof plans and policies. Strategic foresight helps in crafting strategies that are resilient, adaptive, and proactive in the face of uncertainty. This handbook is a contribution to NATO's effort of consolidating foresight tools and approaches for defence and security teams to utilize in support of their organizations' initiatives. Safeguarding the Future presents nine useful tools that reflect best practices in the Strategic Foresight community in an indispensable, hands-on and easy to use format.