THINKING ABOUT TOMORROW

Centre for
Strategic Futures

FOUNDATIONS
What is foresight?

FORMS
What can foresight projects look like?

FOOTHOLDS
How do we do foresight?

CSF

Choose your route!

TIME-BASED

I have 5 minutes.
+ Skim Section 1.

I have 20 minutes.
+ Read Section 1.
+ Skim Section 2 and 3.

I have one hour.
+ Read Section 1.
+ Read Section 2a, and one case study from 2b.
+ Read Section 3a.

I have a few hours.
+ Read everything.

I have several months.
+ Read everything.
+ Attempt tools and frameworks shared, and reflect at a leisurely pace.

TASK-BASED

I want to know what foresight is.
+ Read Section 1.

I want to convince others of its use.
+ Read Section 1.
+ Use the five statements in Section 1 alongside the checklist questions in Section 3a and ideas in Section 3e to engage and persuade your audience.

I want to design a foresight project.
+ Read all of Section 1 and Section 3a.
+ Skim Section 2 for inspiration.
+ Read the rest of Section 3.

I want to look for examples of foresight projects.
+ Read Section 2.
+ For foresight projects done in the Singapore Government, read case studies 2 (Preposterous Futures), 5 (CTRL+ALT+FUTURE), and 11 (Foresight Conference) in Section 2b.

Foreword

If you picked up this handbook, you probably work in foresight or have at least heard of it. At a minimum, you are curious about that vast expanse we call the future, about what it might hold, how we can prepare for it, and how we might shape it. There are many books on foresight, and this is ours.

USE IT, ADAPT IT,
DISAGREE WITH IT,
AND BUILD ON IT.

WHETHER YOU ARE NEW TO FORESIGHT OR HAVE PRACTISED IT FOR A LONG TIME, WE HOPE THIS HANDBOOK WILL BE A USEFUL AND ENJOYABLE COMPANION ON YOUR JOURNEY, INTO THE FUTURE WE ARE ALL HEADING INTO.

We invite you to treat what you read as a starting point.

Who we are

We are foresight practitioners from the Centre for Strategic Futures (CSF), part of Strategy Group in the Prime Minister's Office, Singapore. Foresight practitioners, as the name implies, spend their time thinking about the future. It is a truism that the future is uncertain and will bring change—but what meaningful statements can we make about that uncertainty and that change? If tomorrow is different from today, what should we do differently now?

Why we made this handbook

We believe foresight offers a distinctive way of thinking about change, one that helps people and organisations work with uncertainty rather than wish it away. This book shares what we have learned, both from our own practice and from others', and invites everyone who cares about the future to join the conversation.

What is inside

There is no single right way to do foresight; what follows is the CSF's own exercise to crystallise and articulate what we find true in theory and useful in practice. This handbook has three sections.

1. Foundations—explains what foresight is, the value it brings, and the dispositions that its work requires.
2. Forms—describes different kinds of foresight projects and offers examples.
3. Footholds—provides heuristics and ideas for putting foresight to work.

Who this handbook is for

This book is written mainly for public sector foresight practitioners, which is who we are.

But if you found what has been written so far interesting, then this handbook is for you, too. We wrote it to be readable by avoiding jargon and writing plainly.

You can read the book linearly or modularly. Indeed, to encourage you to meander through the book, we made wayfinding easy and left breadcrumbs along the way.

Throughout, we invite you to treat what you read as a starting point. Use it, adapt it, agree or disagree with it, and build on it. Whether you are new to foresight or have practised it for a long time, we hope this handbook will be a useful and enjoyable companion on your journey into the future we are all heading into.

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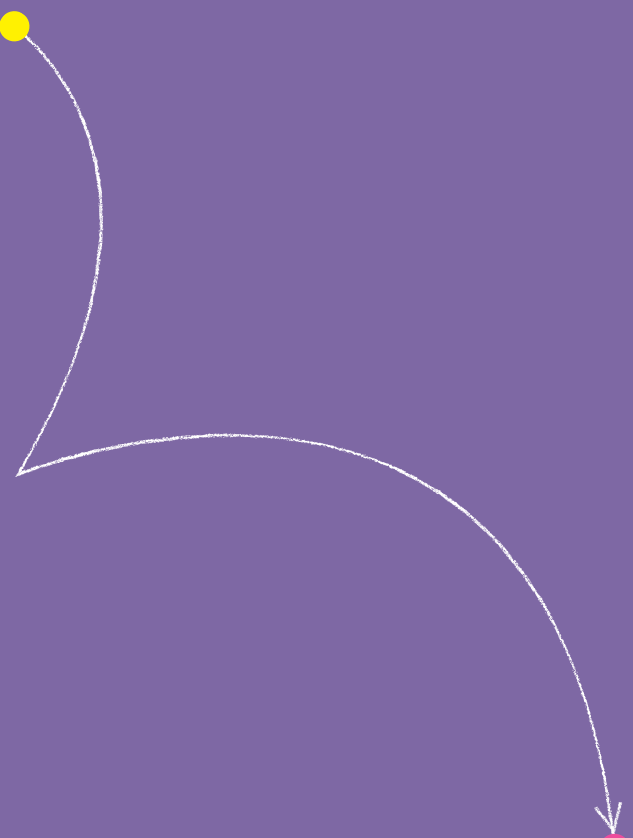


FOUNDATIONS

Before we practise foresight, we need to know what it is.

This section lays the groundwork for the rest of the handbook. The five statements will cover what foresight is, what it is for, and how to approach its practice.

WHAT IS FORESIGHT?

At the CSF, we describe our work as “strategic foresight”, a systematic and deliberate process of using foresight to inform decision-making and strategic planning.

FORESIGHT

The ability to consider and plan for the future.

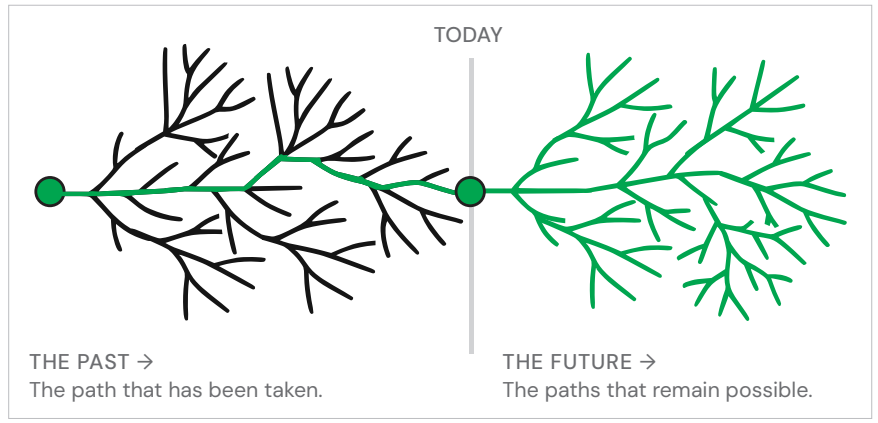
When we say that someone has foresight, we mean that they can anticipate and prepare for future events and developments. This word can apply to both people and organisations—we often describe leaders who have a lot of foresight as visionary.

FUTURES

The presence of possible alternatives that might happen, and the need to consider them.

As the plural word suggests, “futures” recognises there to be a range of possible futures, not just a singular future, at any one point in time.

Often used interchangeably (as it will be in this book), foresight and futures refer to the ability to think ahead and consider multiple futures. This ability pushes us to take proactive steps to shape and prepare for what is coming. We call it an ability because we believe it is something that can be learned over time with deliberate practice.



ABOVE The diagram is adapted from one drawn by Tim Urban, co-founder of *Wait But Why*, a long-form blog covering issues in prose and rough illustrations.

FIVE STATEMENTS ON FORESIGHT

Over fifteen years of practice, the CSF has distilled a few lessons about what foresight is, and what foresight is sometimes mistaken for.

Treat the five statements not as rules but as facets of foresight work the CSF finds true upon reflection. Each contains one half that might be expected, and another that may seem contradictory yet equally true. The format encourages us to hold two ideas at once, and to embrace the tension that foresight work often invites.

1 Not everyone is a foresight practitioner, but everyone thinks about the future.

2 Prediction works when patterns hold, but foresight helps when they break.

3 While there is no single right way to do foresight, there are wrong ways.

4 Just as many futures are possible, many versions of the past and present also exist.

5 Product and process are not separate, but symbiotic.

1 Not everyone is a foresight practitioner, but everyone thinks about the future.

Thinking about the future is not an activity unique to foresight teams and practitioners. We all do this in our daily lives and across different time horizons, be it when preparing for retirement decades ahead, working towards a career move in a few years, or checking the weather before leaving home. This everyday habit of "looking ahead" is widespread, even if it shows up differently across contexts.

Some common contexts for organisations looking ahead include risk management and contingency planning. The "what if" events here are specific and well-understood, like regulatory changes or a database being hacked into, and tend to focus on quantifiable threats or disruptions to existing plans. The outcomes are defined and straightforward, as are the interventions to shape these outcomes.

Like risk management and contingency planning, foresight considers how the future might differ from the past and present. However, foresight focuses on a wider range of trends and issues in complex environments where effects and interactions can be ambiguous and unpredictable. For example, foresight might look at how human longevity, climate-induced migration, and shifting attitudes towards work interact and challenge assumptions about economic growth. When issues cannot be clearly defined, when it is not possible to have complete information, and when outcomes are intertwined, there is no single answer and interventions are not straightforward. Expanding our boundaries of analysis expands our choices for action, and foresight offers a safe space to imagine, explore, and test ideas across multiple possible futures to shape various outcomes.

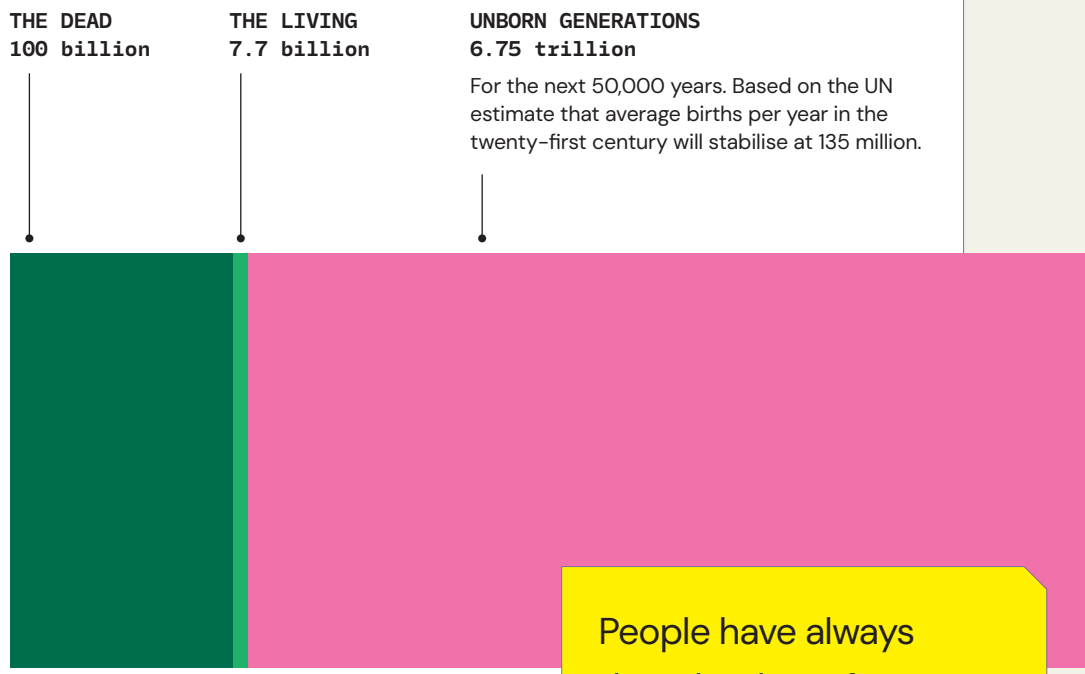
Strategy work is another way organisations think about and act in anticipation of the future. When strategy is informed by foresight, issues can be surfaced early, approaches and assumptions can be tested to see whether they still hold, and shared understanding can be built around what is emerging and changing—all of which help to improve strategy-

Seventh Generation Thinking

The seventh generation principle is based on an ancient Haudenosaunee (Iroquois) philosophy that decisions made today should consider the seventh generation to come. This long-term, intergenerational approach prioritises sustainability, stewardship and the well-being of future generations.

Such thinking lives on today. For example, in 2015, the Future Generations Commissioner of Wales introduced the Well-Being of Future Generations Act, which advocates for the interests of future generations in Wales.

BELOW The statistics below are taken from Roman Krznaric's *The Good Ancestor: How to Think Long Term in a Short-Term World* (2020). In the book, Krznaric presents estimated global population figures spanning past, present, and future generations.



People have always thought about futures that are a long time away.

Cathedral Thinking

Cathedral thinking came from how medieval cathedrals in Europe took decades, sometimes even centuries, to complete.

While the builders knew they would not see the finished product, they worked tirelessly to create something for future generations. Cathedral thinking recognises that the fruits of work today might not be reaped in one's lifetime. Therefore the motivation for such work must come from caring beyond one's parcel of work and one's generation. As the quarry worker's creed describes: "We who cut mere stones must always be envisioning cathedrals."[1]

1 In *Deep Work* (2016), Cal Newport uses the "Quarry Worker's Creed" as a philosophical argument for meaningful work. He encourages readers to find purpose by connecting daily tasks to a larger, impactful vision.

making. Foresight and strategic planning are often seen as separate functions, but in reality the two work together in a strategy process: insights from foresight spark conversations about what matters and why, while strategic planning aligns policies and programmes with larger objectives and across time horizons.

The Singapore Government also thinks about the future in a structured way, with foresight informing what agencies prioritise and implement. For instance, insights from futures projects feed into long-term masterplans and policy reviews, scenario exercises test whether current strategies remain fit-for-purpose, and horizon scanning highlights issues that are worth paying closer attention to. Like everyone else, the Singapore Government thinks about the future, and has its own approach to doing so.

On the one hand, the ubiquity of thinking about the future makes foresight work feel familiar. On the other, it can also make the work challenging, because the timescales and rubrics for assessing futures vary widely across people. Recognising the different reasons for thinking about the future, and the different types of futures being thought about, helps us to identify when and where foresight can be useful. We will share more about that in the next statement.

2 Prediction works when patterns hold, but foresight helps when they break.

Prediction works as long as there is stability between cause and effect, where variables interact in a discernible and reliable pattern: such as planning for next quarter's procurement cycle, estimating passenger flows, or projecting electricity demand. Where systems are bounded and the problem set is tightly defined, extrapolating today's models into tomorrow works well enough.

But the world we live in is an open system that is complex, adaptive, and full of feedback loops we cannot fully map. Because events collide more frequently and cascade more widely, assumptions about stability no longer hold. Under such conditions, prediction becomes strained not because the tools are flawed, but because the underlying patterns themselves are shifting or breaking.

Economist Frank Knight made the early distinction between "risk" and "uncertainty." Risk can be measured, often quantitatively, and targeted and reduced. But uncertainty cannot. Uncertainty, rather, is a feature of the world to accept. Much of modern planning mistakes uncertainty for risk, chasing after predictability even when it is unattainable, which is at best perennially wrong and at worst perennially misleading. Three broad characteristics of today's environment make it more uncertain than before.

First, more shocks. Events once considered rare—global pandemics, large-scale supply chain disruptions, extreme weather, political upheavals—now appear increasingly frequently and overlap.

CYNEFIN FRAMEWORK

A sensemaking tool that diagnoses the underlying dynamics of a situation to guide appropriate responses, avoiding one-size-fits-all solutions. The tool categorises situations into four domains: Clear, Complicated, Complex, and Chaotic.

Second, more connections. Physical infrastructure, digital networks, financial systems, and ecological dynamics are tightly coupled. A disruption in one node propagates far and wide, such as when a single ship running aground in the Suez Canal stalled close to 12% of global trade in 2021. Interactions in a connected system create ripple effects that are difficult to anticipate from precedent alone.

Third, more speed. The tempo at which change unfolds is accelerating. Information spreads instantly, and capital moves in milliseconds. Modern conflict compresses what were once years-long technology cycles, as Ukraine did when adapting commercial drones for military purposes in months.

Together, these shifts create what some have described as a "polycrisis", "permaweird", or a "perfect long storm." These words capture the sense that disruptions now come all at once, with effects amplified, leaving many befuddled by how unstable reality is becoming and foiling our efforts to predict.

This is not to say that foresight is without any solid ground to work from. There are frameworks that help diagnose what *type* of situation we are in, and what we should do.

One of them is the **Cynefin Framework**, which identifies four categories situations can fall into: clear, complicated, complex, and chaotic. "Clear" situations are those in which recommended action is clear and doable—such as not crossing the road when the traffic light is red. "Complicated" situations are those in which even if unknown to you, there are clear steps an expert will know to take—such as how to build an aeroplane.

However, predictability diminishes as we move into the "complex" and "chaotic" categories. "Complex" situations are novel and emergent,

"Risk" and "uncertainty" are often used interchangeably, although they mean different things. Where did those terms come from? What distinctions exist between and within them?

The next page shows some ways that "risk" and "uncertainty" have been conceived...

such as the COVID-19 pandemic, so one must probe, learn, and act at the same time. And in truly "chaotic" contexts, such as in the immediate wake of a natural disaster, rapid response is needed first to restore safety and order, only after which can sensemaking begin. The Cynefin Framework is a clarifying heuristic for assessing the many kinds of situations we can be in and what we then must—and must not—do.

It is not that uncertainty is a new phenomenon. Complex systems, volatile variables, and disruptions have occurred before. But what is different today is the intensity with which these systems interact, accelerate, and amplify one another.

Because of that change, foresight is needed to complement prediction, by helping organisations resist siloed thinking especially when shifts are rapid and systemic. By widening the range of futures considered, testing assumptions, and preparing for discontinuity when patterns break, foresight helps organisations act and learn better, even when things are unknown or unknowable.

See Case Study 6 (Strategic Intelligence) in **Section 2b** for a project centred around interconnections, and **Section 3c** for ways to help analyse complex interactions and cascading effects.

Page 80

Page 138

See **Section 3b** for tools that help work with uncertainty through scanning and interpretation.

Page 130

Frank Knight (1921): Risk versus Uncertainty

Economist Frank Knight, in *Risk, Uncertainty, and Profit* (1921), made a foundational distinction between:

+ Risk—situations in which outcomes are unknown but the probabilities of those outcomes are known or measurable.
+ Uncertainty—situations in which neither outcomes nor their probabilities can be specified.

Knight argued that much of economic and organisational life takes place under true uncertainty. However, institutions often treat uncertainty as if it were risk, modelling what cannot be reliably quantified.

Ulrich Beck (1986): Manufactured Risks in the "Risk Society"

Sociologist Ulrich Beck, in *Risk Society* (1986/1992) showed that late modernity produces "manufactured risks", which are risks arising from technological and industrial systems such as nuclear technology, industrial pollution and genetic engineering.

These risks are:

+ Global—crossing borders and sectors.
+ Invisible—not directly perceptible without expertise.
+ Systemic—embedded in modern life.

The problem is not simply more risk, but that risks formerly bounded now spread far, deep, and wide.

Ziauddin Sardar (2000s): Post-Normal Times

Building on Funtowicz & Ravetz's idea of "post-normal science", futurist Ziauddin Sardar describes the current era, in general, as "post-normal times", which is shaped by:

+ Complexity—multi-causal, overlapping issues.
+ Chaos—unpredictable cascades.
+ Contradiction—conflicting yet coexisting perspectives.

In post-normal times, uncertainty sits at the centre of decision-making, not at the margins.

Limor Samimian-Darash (2010s): Possible versus Potential Uncertainty

Anthropologist Limor Samimian-Darash distinguishes between:

+ Possible uncertainty—unexpected events that still fit existing categories.
+ Potential uncertainty—novel events arising outside known frames, requiring scenario exploration, imagination and adaptive structures.

Her research on national preparedness exercises shows that readiness is less about prediction, but about building institutions able to work with the unknown and the unknowable.

Nassim Nicholas Taleb (2007, 2012): Extremistan versus Mediocristan

In *The Black Swan* (2007) and *Antifragile* (2012), Nassim Nicholas Taleb shows that many modern social, technological, economic and networked systems behave according to "power laws", where a small number of actors exert large impact, rather than Gaussian "normal" distributions.

These Extremistan systems feature:

+ A few events or actors dominating outcomes
+ Small triggers producing outsized cascades
+ Fat-tailed distributions where averages are misleading
+ Rare events exerting disproportionate influence

Real-world phenomena—from spending patterns to accident rates and disease spread—do show radically skewed behaviour. In such environments, extreme events matter more than averages.

How to act in different types of situations (Cynefin Framework)

The **Cynefin Framework** helps us to recognise four kinds of systems we might find ourselves in, and how to act wisely in each.

1. CLEAR
The domain of known knowns and best practice. These are stable, predictable systems with clear cause-and-effect relationships. You can rely on established rules and standard operating procedures.

How to act:
Sense → Categorise → Respond
Follow best practices and refine them over time.

2. COMPLICATED
The domain of known unknowns and good practice. Here, cause and effects exist, but are not obvious. Analysis or expert judgment is needed to uncover them.

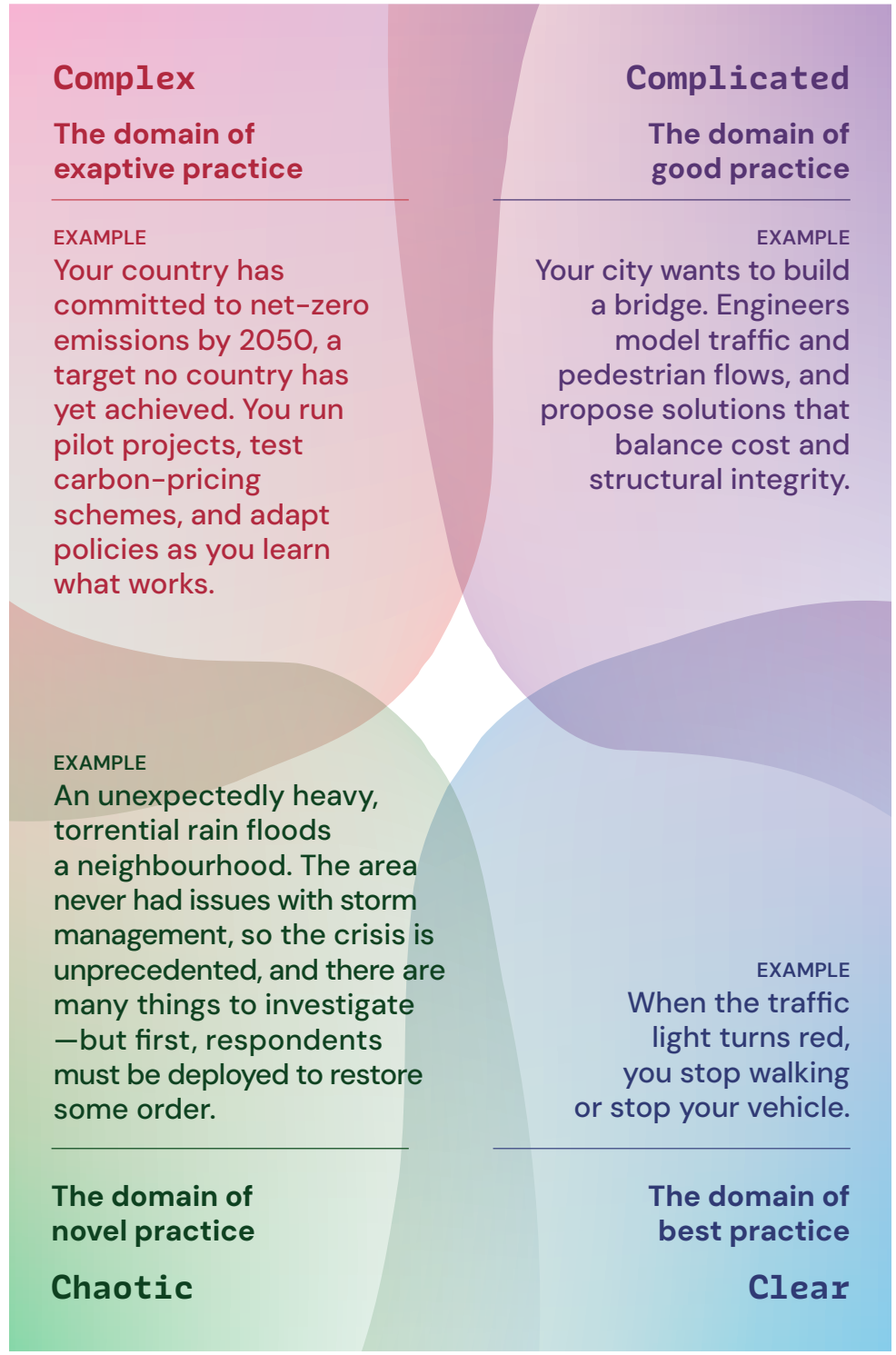
How to act:
Sense → Analyse → Respond
Bring in specialists, compare alternatives, choose the option that fits best.

3. COMPLEX
The domain of unknown unknowns and exaptive practice. In complex systems, patterns emerge only in hindsight. Cause and effect shift as actors interact. The best way forward is to probe and learn.

How to act:
Probe → Sense → Respond
Run safe-to-fail experiments, identify what works, scale what succeeds.

4. CHAOTIC
The domain of unknowable unknowns and novel practice. In chaos, there is no discernible relationship between cause and effect. Regain stability first, so sensemaking can begin.

How to act:
Act → Sense → Respond
Act decisively to restore order, then shift into other modes for learning.



Why complex systems are hard to predict

INTERCONNECTEDNESS
All parts are linked, and a change in one element ripples across the system in unexpected ways. Example: The 2021 Suez Canal blockage disrupted global supply chains and led to downstream inflationary pressures.

EMERGENCE
The whole behaves differently than its parts. Example: Thousands of starlings flock in shifting, coordinated patterns known as a murmuration, even though each bird follows only simple local rules.

NONLINEARITY
Small changes can have disproportionately large impact (also known as the butterfly effect). Example: An animal going extinct can have major downstream and spillover implications on the animal and human food chain.

ADAPTATION
Components of the system adjust in response to changes in the environment or other parts of the system. Example: Cyber adversaries evolve tactics as defences improve.

FEEDBACK LOOPS
Actions and reactions within the system reinforce and counteract one another, thus amplifying or dampening effects. Example: Panic buying magnifies shortages, which increases panic.

3 While there is no single right way to do foresight, there are wrong ways.

We are sometimes asked how a foresight exercise is to be done "correctly." However, there is no single right way. Different organisations face different questions, constraints, and cultures, and good foresight practice adapts accordingly. Some projects require broad participation, some require deep research, and some require short and timely synthesis.

Plurality should not be mistaken for licence to do anything. Foresight becomes ineffective when tools are used without reflection or when methods are transplanted wholesale from one context to another. Because foresight involves meaning-making, poor practice often comes from overlooking the assumptions, histories, and lived realities that shape how people interpret change. Treating foresight as if it is value-neutral, a checklist to complete, or a template to replicate, are some ways to get it wrong.

Good foresight begins with the practitioner's mindset. At the individual level, foresight depends less on fixed recipes and more on cultivating the dispositions for thoughtful judgement.

The **Habits of Mind**, a framework developed by Art Costa and Bena Kallick, lists traits that help people learn and reason effectively across many fields. It is apt for futures work too. One habit is metacognition, the capacity to think about one's thinking. How can an issue be self-evident to one but be a blind spot for another? What implicit value systems shape how the "eye" sees? Because the new can feel strange, and because foresight often sits in the tension between the old and the emerging, the ability to think flexibly and hold contradictory ideas is also essential. Altogether, the Habits of Mind offers guidance on how to work, even when what issues to work on are unclear.

See FORAGE Axes in **Section 2a** for examples of different valid approaches to foresight.

Page 40

A LIST OF PRODUCTIVE TRAITS FOR FORESIGHT PRACTICE (HABITS OF MIND)

1. Thinking about your thinking (metacognition)
2. Persisting
3. Managing impulsivity
4. Striving for accuracy
5. Listening with understanding and empathy
6. Thinking flexibly
7. Questioning and posing problems
8. Thinking interdependently
9. Thinking and communicating with clarity and precision
10. Applying past knowledge to new situations
11. Gathering data through all senses
12. Creating, imagining, and innovating
13. Taking responsible risks
14. Finding humour
15. Responding with wonderment and awe
16. Remaining open to continuous learning

ABOVE Developed by Art Costa and Bena Kallick, the 16 Habits of Mind lists sixteen behaviours that can help one become a better learner and thinker. They are also valuable skills for those engaged in futures work to cultivate.

Compared to when working alone, a different combination of skills is needed when working in an organisation, where colleagues and stakeholders are involved. At the CSF, our attempt at institutionalising these skills is captured in our *Futures Functional Competencies*, a document that articulates the unique capabilities that futurists in government may need. The competencies include: researching uncertainty; communicating complexity; fostering generative conversations; building relationships; and developing futurists in government. These dimensions cater to the relational and organisational aspects of foresight practice, especially in large systems with many others, with many job scopes, working on many time horizons.

These foundations of individual and organisational practice keep foresight work thoughtful and appreciative of context. They separate the right ways from the wrong ways of doing foresight, such as when it is used as a panacea, as a one-size-fits-all approach, or as branding. Altogether, when organisations support these right ways through shared language, regular reflection, and collaboration, foresight becomes a muscle that anyone can exercise, rather than an isolated endeavour conducted by the foresight team alone.

Common misassumptions around foresight practice

"Foresight must look far into the future."

Not necessarily. Foresight is about navigating uncertainty, and uncertainty exists not only in the distant future, but also in the medium and near term, especially in fast moving domains like technology. Focus less on the time horizon, and more on what blind spots or questions you want to address first. Then, decide how much uncertainty—and how far into the future—you need to explore, to serve that purpose meaningfully.

"Foresight must cover technological developments."

Technology is not the only driver of change, and its effects often spill far beyond the technological domain. The classic animated sitcom *The Jetsons*, set in the far future, imagined a world filled with intricate robots and holograms, yet could not imagine Jane Jetson, its main female character, to be motivated by much beyond family and fashion. Focusing too narrowly on technology can blind us to deeper social, cultural, or behavioural shifts. What other domains might you be overlooking when thinking about how the future can be different?

"Foresight will give me more certainty about the future."

Practising foresight gives you no more certainty about the future than reading science fiction does. What both can do, however, is broaden your imagination of what the future can be, and with that, expand the range of preparations you might have to make. For example, foresight tools can help you spot signs of change early, surface hidden assumptions held today, or discover what resources you might need in an unexpected future. All of that helps you to see clearer, which is valuable regardless of what lies ahead.

See "Review Project Progress" in **Section 3a** to see how and when projects can be adapted during their process.

Page 126

Competencies for foresight practitioners in the Singapore Government (The CSF's Futures Functional Competencies)

BELOW The five competencies in the CSF's Futures Functional Competencies, a document used to articulate skills that futurists in Government might need.

BUILDING RELATIONSHIPS WITH THINKERS AND DOERS
Foster relationships and work collaboratively with a range of stakeholders, to maintain relevance as a local and global foresight institution.

COMMUNICATING COMPLEXITY TO DIVERSE STAKEHOLDERS
Convey complex ideas and related insights effectively, through various mediums, approaches and products tailored to different stakeholders, for foresight impact.

DEVELOPING FUTURISTS IN GOVERNMENT
Design, organise and deliver a wide range of training and developmental activities to enhance futures thinking in Government.

FOSTERING GENERATIVE CONVERSATIONS
Design, organise, and facilitate lateral, divergent, and/or convergent conversations, in multiple modalities and scales with a range of stakeholders, to influence policy thinking.

RESEARCHING AND MAKING SENSE OF UNCERTAINTY
Uncover patterns, spot challenges and opportunities, and infer insights to inform policy thinking amidst uncertainty and complexity.

These competencies underpin the steps for making foresight projects in **Sections 3a–3e**.

Page 112

4 Just as many futures are possible, many versions of the past and present also exist.

Foresight emphasises that the future is plural, as many things could happen. But plurality does not exist only in the future; it exists in the present and the past also. The present is experienced differently by people of different socioeconomic status, religion, and nationalities. Moreover, the past is not a fixed record, but something constantly revisited, contested, and reinterpreted as new evidence and perspectives emerge.

As one example, consider the debates around the repatriation of museum artefacts. Many items previously described as being "acquired" during cultural expeditions, it turns out, were taken coercively or forcibly. As new documents surrounding these events are discovered, communities from which these artefacts originated now demand their return. Historical events hold different meanings depending on who is recalling them and why.

Recognising the plurality of pasts and presents matters because every foresight exercise begins with some understanding of "where we are" and "how we got here." If these foundations are assumed to be singular, we risk building futures that overlook entire lived realities. For instance, a small increase in public transport fares may barely register for higher-income commuters but can materially affect lower-income workers who rely on multiple transfers each day. What feels urgent in one context may be invisible in another.

Therefore, good foresight practice pays attention not only to future possibilities but also to the assumptions and narratives that shape how people understand today and yesterday. Plural pasts and presents influence what feels possible, desirable, or concerning in the future.

FUTURES CONE
A diagram showing how types of futures—projected, probable, plausible, possible, and preposterous—expand over time. Helps clarify the range of change that might unfold.

ENTANGLED TIME TREE
A visual framework illustrating how pasts, presents, and futures are intertwined, showing that time is nonlinear and shaped by multiple histories and interpretations.

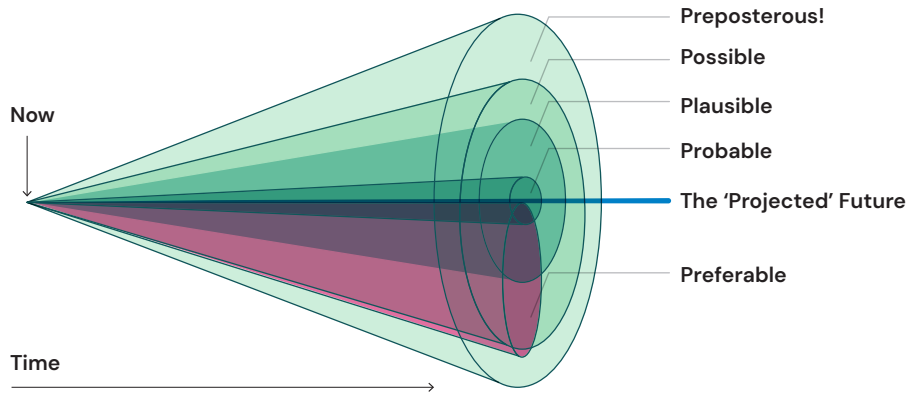
Two visual tools help explain this. The **Futures Cone** shows how futures branch outward and widen over time. In that range lie several kinds of futures: they could be probable, plausible, possible, or even preposterous but still worth considering. The Cone is a reminder that the future and the paths toward it are plural.

Meanwhile, the **Entangled Time Tree**, reminds us that time does not move only forward, and neither are past, present, and future separate. Inspired by the baobab—a family of trees found in Africa and Australia, with deep roots and branching crowns, living up to thousands of years old—the Entangled Time Tree tells us that just as roots resurface, branches split, loop, and are pruned, so can different strands of time influence one another. The framework reflects how histories reappear in new forms and how expectations of the future shape decisions made today.

The past, present, and future are all deeply connected, and none are as settled as we assume them to be. Even as the ambit of foresight work lies ahead, treating the past and present as singular flattens the ground from which other futures grow. But when these multiplicities are recognised, foresight work becomes richer, more honest, and more attentive to the world as it really is.

The Futures Cone shows the range of futures that can happen

In futures thinking, we emphasise that there is never just one future, but many. The **Futures Cone** helps us visualise this multiplicity from what is most to least likely. Moving outward from the centre:



ABOVE Joseph Voros's Futures Cone illustrates the variety of possible futures.

+ Projected and Probable Futures—these are the futures we expect based on current trends and linear projections. This is where prediction, short-term forecasts and extrapolations are most reliable.
+ Plausible and Possible Futures—these are futures that could or might happen, based on weak signals, emerging trends, or alternative assumptions. Foresight tools such as scenario planning help us explore these futures and stress-test them against initial assumptions.
+ Preposterous Futures—these are futures that seem far-fetched. Yet, they are valuable precisely because they stretch our imagination and challenge our assumptions. History shows that outliers happen more often than we expect. Few imagined the Soviet Union would collapse overnight—until it did.

See Case Study 2 (Preposterous Futures) in **Section 2b** for an example of its extreme edges in use.

Page 62

The Entangled Time Tree shows how pasts, presents, and futures are multiple and intertwined

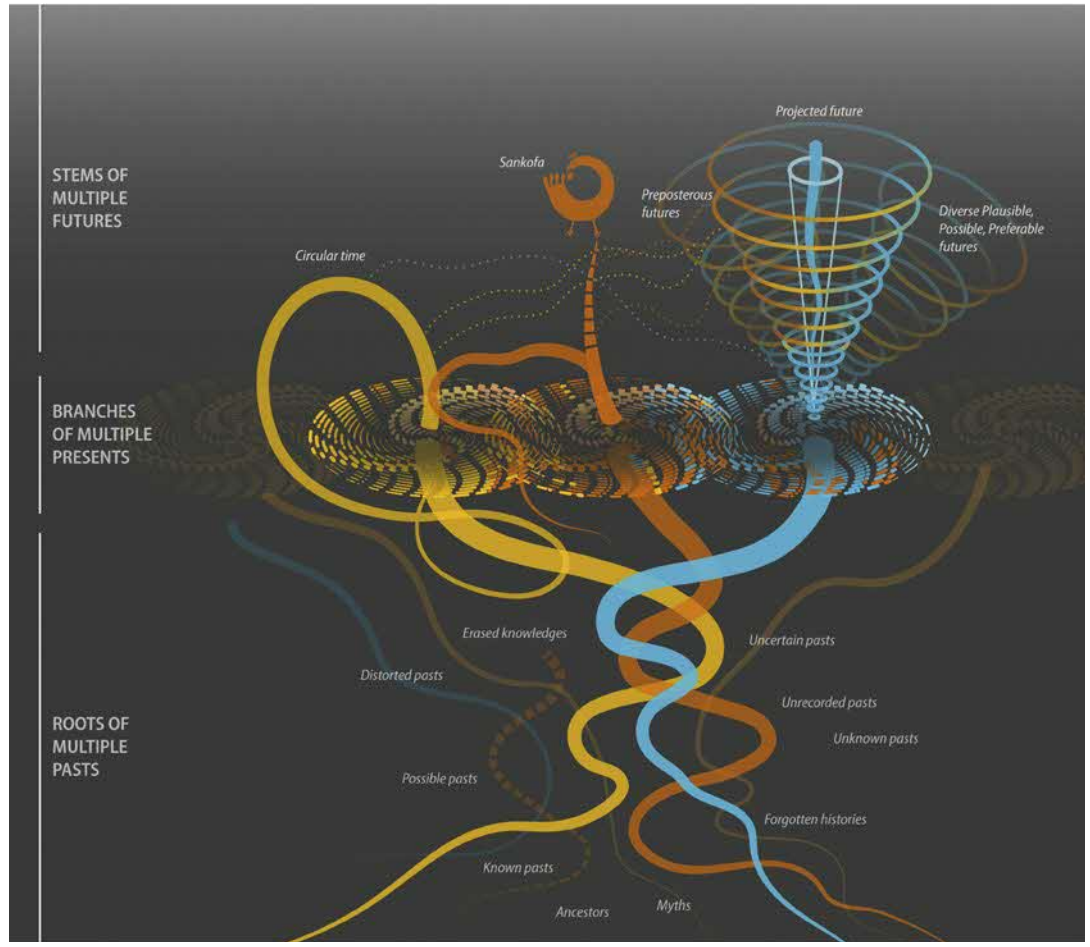
The **Entangled Time Tree** challenges the common mental framework of linear time and simple causality. Inspired by a baobab plant, the diagram envisions time as an interconnected tangle of stems, branches, and roots, where multiple strands of each exist. Moreover, the roots, branches, and stems flow into each other, indicating how the past, present, and future are constantly influencing and reshaping one another.

The diagram makes other points:

+ Multiple futures can emerge from one past. Different outcomes can emerge from the same historical root, depending on choices made in the present.
+ Time can be understood nonlinearly. The present can be shaped by what we expect, rightly or wrongly, the future to be.
+ Timelines can be interwoven. Different people experience time differently, leading to overlapping histories and futures.
+ Regrowth can happen. Histories considered resolved can re-emerge, as old ideas resurface in new contexts.

See Case Study 8 (Participatory Backcasting for Reconciliation) in **Section 2b** for a project that cuts across multiple histories.

Page 88



ABOVE The Entangled Time Tree is a contribution to the body of futures approaches by Naomi Terry, Azucena Castro, Bwalya Chibwe, Geci Karuri-Sebina, Codruţa Savu, and Laura Pereira. It is a multi-dimensional framework that acknowledges multiple pasts and alternative ways of conceptualising futures.

Methods to surface multiple pasts and presents

CONDUCTING FIELDWORK AND IMMERSIVE OBSERVATION

Seeing how different groups live, work, and interpret their surroundings reveals how varied "the present" really is.

Example: In rethinking the future of ageing, speaking with caregivers, seniors, social workers, and employers surfaces very different baselines. Alongside aspirations of active ageing sit manpower strain, uneven distribution of care work, and chronic pain.

DESIGNING FOR EXTREMES

Considering edge cases, outliers, and unconventional users exposes assumptions that "average" perspectives obscure.

Example: When exploring the future of public transport, including wheelchair users, midnight-shift workers, and delivery riders reveals frictions that a daytime commuter never encounters.

DIVERGING BEFORE CONVERGING

Encouraging participants to explore multiple possibilities before narrowing them down helps avoid premature closure around a single shared "present."

Example: In a multi-agency workshop on the future of food resilience, participants first surface all perceived risks—from climate impacts to shifting consumer norms to geopolitical shocks. Even amid disagreement, divergence makes multiple realities visible before the group converges on priorities.

DOCUMENTING DISSENSUS

Minority reports allow alternative interpretations of the present or past to be formally recorded, rather than absorbed into the majority view or assumed away.

Example: A committee examining rising obesity rates agrees that individual lifestyle choices are the primary driver. A minority subgroup rejects this framing, arguing that structural factors—such as limited access to fresh food in certain neighbourhoods and targeted marketing of high-calorie food to low-income communities—are more decisive.

ASKING "HOW DID WE GET HERE?"

Different stakeholders hold different histories—not of facts, but of meaning, priorities, and emotional memory. Asking people to tell the story of "how we arrived at today" surfaces these divergent pasts.

Example: In accounts of Singapore's digital economy, a policymaker may emphasise regulatory milestones, a start-up founder may recall moments of opportunity, while a gig worker may remember the same transitions as precarious.

The tug-of-war for time expresses the tension between short- and long-term thinking

Our minds and organisations are pulled relentlessly toward the short term. Roman Krznaric of the Long Now Foundation describes this tension as a "tug of war for time."

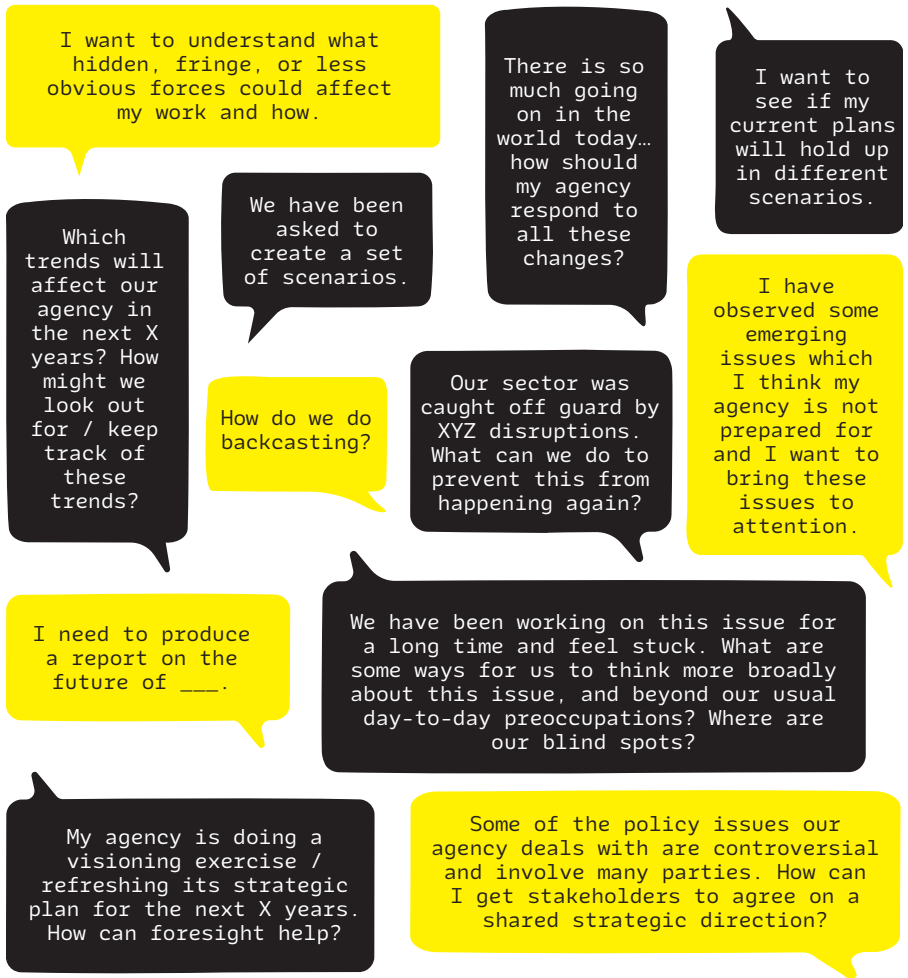
On one side sit the pressures and incentives of short-termism that dominate attention and decision-making. On the other are cognitive tools that deliberately extend our time horizon. These must be actively cultivated if we are to act as good ancestors, stewarding for future generations. As Krznaric notes, long-term thinking is rarely incentivised, but it remains possible through conscious practice.

SIX DRIVERS OF SHORT-TERMISM	SIX WAYS TO THINK LONG
1. Tyranny of the Clock	1. Deep-Time Humility
2. Digital Distraction	2. Legacy Mindset
3. Political Presentism	3. Intergenerational Justice
4. Speculative Capitalism	4. Cathedral Thinking
5. Networked Uncertainty	5. Holistic Forecasting
6. Perpetual Progress	6. Transcendent Goal

ABOVE Roman Krznaric unpacks the "tug of war for time" in his 2020 book, *Six Ways to Think Long Term*, which reflects the challenges in balancing immediate pressures with future possibilities.

5 Product and process are not separate, but symbiotic.

There are many ways in which organisations enter the wonderful world(s) of futures thinking. Perhaps the best way to outline the many tenets of foresight work is to share questions commonly posed to the CSF. Though most of these questions come from government agencies in Singapore,



See **Section 3a** for how process and product are part of the considerations in scoping a foresight project.

Page 116

they are not unique to public sector work or Singapore. You will see that some cases start out product-heavy, with outputs as the assigned task, while others seek out processes to help with strategic decision-making and organisational learning.

Sometimes we end up focusing on product more than process. Products are tangible, usually identified as key deliverables, and often receive the most attention from audiences. This can make it seem like products are the sole point and value of foresight work. Conversely, it can be hard to see why processes matter. Processes are frequently cut short or even abandoned in a time crunch because they require time and effort to design well and carry out, especially if diversity and collaboration are objectives. Processes also require skilled facilitation. It is difficult to make space for and find the right people to design and take people through processes, but faster and easier (and maybe more fun to some) to spend time creating products or to journey through a project alone.

In strategic foresight, process and product feed each other. Products only hold value if they contain insight and spark new conversations; processes only work when they are shaped by the questions, constraints, and reflections that products make visible. When a process helps people reframe problems, surface assumptions, and explore alternatives together, the eventual outputs are richer, clearer, and more meaningful. Both product and process matter—and to each other.

This is why foresight's value lies not only in what it produces, but in what it enables. Scenarios, discussions, and workshops change how people frame problems, surface hidden assumptions, allow for people to build off each other's thoughts, and coordinate action. Participants may disagree on what the future can look like or what is desirable, but within that disagreement lies a chance for subjective and implicit assumptions to be made explicit. The thinking and conversation that processes provoke using products, in turn, improves the quality of the eventual outputs.

Foresight increases the scope of what we notice and are aware of. But knowledge aside, it should also raise our capacity for better collective judgement. The outcome is not just insight but capability: a community better equipped to think together, with shared language and shared objectives, and a coherent way to make decisions with a wider range of possibilities and a longer time horizon in mind.

Note that foresight is not a panacea. It can help, but it does not solve—and certainly not solve entirely. Other organisational functions must also play a role, be it in finding the right questions to ask, reconsidering why and how things are done, or in implementing decisions.

Processes

Examples: Scanning for signals of change, developing and testing scenarios, facilitating divergent conversations.

Processes build understanding, shared ownership, and foresight capability. They generate insight by expanding perspective, involving others, and supporting collective sensemaking — including space for divergent views.

Products

Examples: Reports, maps, visual frameworks, scenarios, films, workshops, exhibitions.

Products capture and communicate insight.They make abstract ideas tangible, spark dialogue, and feed the next cycle of inquiry.

See “Emphasis Placed” axis of the FORAGE Axes in **Section 2a**, for how projects balance process and product.

Page 53

CARING FOR YOUR PROCESS: NOT BEING INEFFICIENT, BUT BEING EFFECTIVE

Good process resists the urge and anxiety to “just get to the answer”, but instead invests in protected time and space for different voices to be heard and contribute, and for interesting ideas to emerge. This can help you avoid the traps of compressed thinking and siloed thinking, which usually results in superficial analysis, blind spots, as well as hurried and poor decision-making.

Remember: While there is no single right way to do foresight, there are wrong ways. We offer three tips on how to design your futures process with care:

First, a good foresight process does not just collect individual inputs, but also actively brings diverse perspectives into collaborative and generative conversation. This requires structured dialogue, not just information sharing, as well as empathy and open minds.

Second, good process creates deliberate pauses for ideas to mature throughout the foresight journey. Insights that emerge after sleeping on a provocation differ fundamentally from hot takes generated under time pressure.

Protect time to pause and incubate. Spread activities out across days, or even weeks, to allow people to process, ruminate, and reflect between sessions to integrate new perspectives and challenge assumptions (or get used to having their own assumptions challenged!).

Third, within any single session, a good process provides sufficient time for emergence, divergence, and convergence to happen. Cramming multiple activities or rushing through exercises can compromise what your audience contributes, what they take away from the experience, and the eventual quality of the insights and products borne from the process.

Design for depth over breadth. Drip-feed provocations, tools, and frameworks rather than overwhelming participants with several at one go. A single well-explored finding generates more valuable insights than many rushed through superficially.

What kinds of impact foresight can make

Foresight's impact is not always immediate or measurable, but it can be recognised in how people respond and what changes as a result, like mindsets and actions. How might we know if our products and processes are being helpful?

Reception and uptake

+ Is your work being widely shared or discussed?
+ Are audiences curious or interested to find out more?
+ Are audiences inspired to embark on something similar, or collaborate with you?

Expanding sense of possibility

+ Did it widen how audiences frame and interpret change, challenges and opportunities?
+ Did it broaden the range of topics people are willing to broach?
+ Did it move once-unthinkable ideas and options into the realm of plausible and feasible?

Growing confidence and capacities

+ Did it result in more proactive approaches to spot changes early?
+ Did it lead to the inclusion of more perspectives and voices in analysis and decision-making?
+ Did it uncover or create relationships that make work better or easier to do?
+ Did it make people feel hopeful and empowered to shape the future in some way?

See "Review project progress" in **Section 3a**, for indicators to review foresight projects.

Page 126

See **Section 3e** for how engagements build shifts in meaning and connection.

Page 152

SHIFTS IN MINDSETS AND ACTIONS

Closed → Curious

Paralysed by uncertainty → Confident navigating uncertainty

Reactive → Anticipatory

Avoid difficult conversations → Embrace difficult conversations

Siloed Thinking → Systems Thinking

What foresight can and cannot help with

Foresight does not remove uncertainty, but it helps us meet it with better judgement. It widens what we see, challenges what we assume, and strengthens how we prepare. In that light, foresight is about acting better, not tomorrow, but today.

However, futures should not be seen as a magic wand. It can neither eliminate unknowns nor single-handedly make an organisation more agile, innovative, or shock-proof. The impact of foresight work, as with other kinds of work, remains contingent on its reception by its intended recipients, whom we can cajole but not force.

In an organisation, foresight is just one node of many. Therefore, foresight works best when embedded in and connected with other departments—such as strategy, planning, policy, operations, communications, and organisational development.

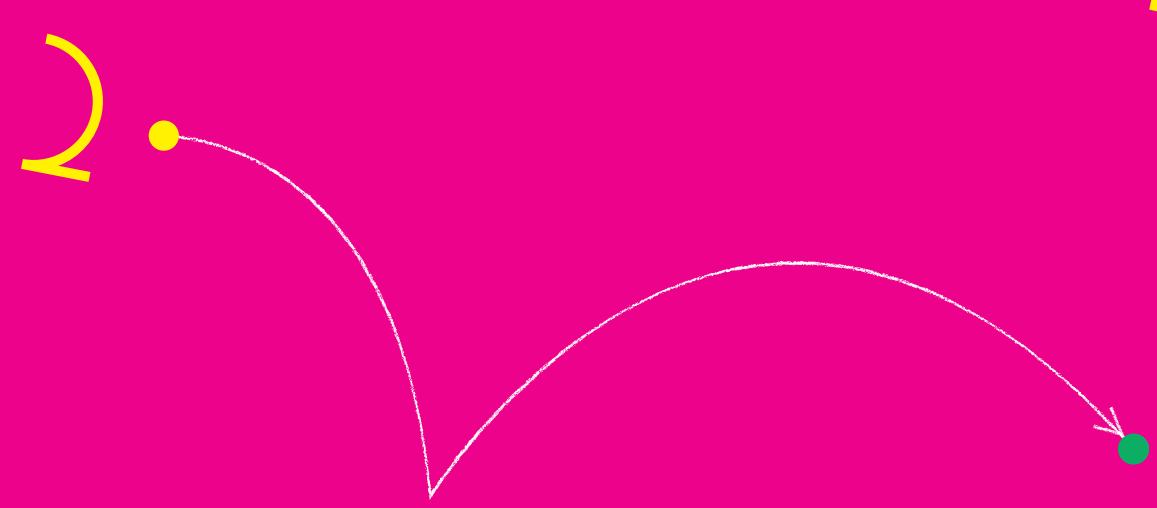
When practised regularly and across teams, foresight no longer needs to stand out as a special activity. It becomes part of how the organisation thinks and works, a steady muscle that helps everyone move with change.

See **Section 3d** for how to translate foresight into decisions while recognising its limits.

Page 144

Foresight projects come in many kinds. They differ in what they focus on, how they are designed, and what they aim to achieve.

Section 2a introduces the FORAGE axes, which describe the main ways such projects can be conceptualised and categorised. Section 2b then looks closely at how different projects are made, through real examples.



FORMS

FORAGE: SIX AXES OF FORESIGHT PROJECTS

As with every other section, we invite you to take the frameworks and examples herein as starting points, not ending points, for your own doing, understanding, and wandering.

Intuitively, we have a feeling that foresight projects can come in many different forms. But how, more specifically, are they different? This section proposes six axes along which these differences can be described. Across the examples, we show that there is no single form a good foresight project must take. The axes should both clarify and challenge assumptions about what good projects can—and need not—be.

See **Section 2b** for examples of projects situated along each axis, and **Sections 3a–3d** for how these axes guide scoping, scanning, and strategy.

Page 56

Page 116

The axes also remind us that method choice is rarely mechanical. The same tools can serve different purposes, and different tools can achieve similar ends. Knowing how to choose, adapt, and combine them is as much a matter of practice and judgement as it is of theory.

BOUNDED	**Flux** Range	EXPANSIVE

How wide a horizon of possibility is the project exploring?

MONO-MODAL	**Output** Modality	MULTI-MODAL

In how many forms will the project be expressed?

LOW	**Resources** Involved	HIGH

What level of time, money, and effort can the project draw on?

QUANTITATIVE	**Approach** Used	QUALITATIVE

What kinds of evidence, reasoning, or ways of knowing shape the project?

PRACTICAL	**Goal** Intended	EXPLORATORY

Is the project designed to drive action, or invite reflection?

PROCESS	**Emphasis** Placed	PRODUCT

What matters more: the journey or the destination?

Elaboration can be found in **Section 2b**.

BOUNDED

FORWARD TO SCHOOL: GUIDANCE FOR REOPENING BY EDUCATION INTERNATIONAL (EI)

This report provides education unions worldwide with guidance, case studies, and resources across five pillars—dialogue, health, equity, well-being, and trust—to ensure safe, equitable, and resilient school reopening.

SPOTLIGHT SERIES BY THE CENTRE FOR STRATEGIC FUTURES (CSF)

A fortnightly series of issue briefs covering nearer-term issues during the early months of the COVID-19 pandemic, to support colleagues deep in rapid response and uncertainty as the virus evolves.

THE LONG NOW FOUNDATION

A cultural organisation promoting long-term thinking through projects like the 10,000-year Clock, the Rosetta Project, and public seminars, inviting societies to think on civilisational timescales.

EXPANSIVE

PREPOSTEROUS FUTURES BY CIVIL SERVICE COLLEGE APPLIED SIMULATION TRAINING (CAST)

Through considering scenarios around AI that some might deem far-fetched, this project surfaces assumptions around work, workplace, and workforce today, and how they might or might not hold in a wildly different future.

EMERGING STRATEGIC ISSUES BY MINISTRY OF DEFENCE (MINDEF)

A structured deck of emerging drivers used in workshops to surface weak signals, challenge prevailing assumptions, and explore how unfamiliar forces might reshape the strategic environment over time.

Flux Range

See **Section 3c** for tools that surface unexpected consequences in and pathways to the future.

Page 138

It is easy to assume foresight deals only with distant futures or radically new possibilities. In reality, foresight projects vary widely in how much uncertainty—or flux—they take on, and that amount can be calibrated.

A common proxy for estimating uncertainty is the time horizon. Generally, the further ahead we look, the more unknowns accumulate.

But the topic also matters. Five years in urban infrastructure—where roads and tunnels take years to build and operate for decades—does not unfold with the same rhythm as five years in digital technology. Domains can also shift in tempo. Climate change may seem slow until tipping points trigger rapid collapse. Time is only one heuristic; a topic's inherent pace and complexity matter too.

Audiences shape this calibration as well. Their tolerance for uncertainty determines how much flux would be useful for a project to explore. Too little, and the work may not challenge them; too much, and they may disengage. Organisationally, institutions also differ in what they consider long term. Agencies overseeing infrastructure may be comfortable looking 30 to 50 years ahead, while those working in technology only three years out.

What matters is not choosing the "right" amount of uncertainty, but the appropriate amount for the task. The Flux Range reminds us that uncertainty is not a fixed attribute of foresight, but a design choice we can consciously make. Do you clarify the next bend in the road, or provoke with worlds radically different from today? Both can be good.

Elaboration can be found in **Section 2b**.

THE NEW MAP OF LIFE
BY STANFORD CENTER ON LONGEVITY

A report reimagining how societies might adapt to significantly longer lives—redesigning education, work, housing, health, and community across a 100-year lifespan.

MONO-MODAL

FUTURE OF THE SEA BY UK GOVERNMENT OFFICE FOR SCIENCE (GO-SCIENCE)

A research project on the future of the sea, one of the most relied on but deeply understudied habitats on Earth, with the seabed being less mapped than the surface of Mars.

FUTURES BAZAAR TOOLKIT BY STUART CANDY

A participatory toolkit for staging "futures bazaars", where communities co-create and showcase speculative artefacts using reused items, offering a playful, multi-sensory way of engaging with possible futures.

RELATIVE CREATIVE

A First Nations-led design and foresight studio that spans strategy, visual communication, community collaboration, and place-based work. It brings strategic design, futures thinking, and community insight together to support environmental and social transitions.

MULTI-MODAL

IPS PRISM BY INSTITUTE OF POLICY STUDIES (IPS)

A foresight project on governance that engaged the public through dialogue, installations, and forum theatre.

Output Modality

Foresight outputs can be delivered in many modalities. Some stay mono-modal, consisting only of a report, a deck of slides, or a memo. Others are multi-modal and include short films, interactive dashboards, theatre, simulations, games, or design artefacts alongside reports. The modality chosen determines how diverse audiences engage, remember, and act.

Foresight is not just intellectual but also affective, and form communicates as much as content. Whether your audience prefers a tight executive brief or an immersive experiential encounter, picking the right modality ensures that the message resonates.

Elaboration can be found in **Section 2b**.

DRIVING FORCES WORKSHOPS
BY THE CENTRE FOR STRATEGIC FUTURES (CSF)

Short workshops using the CSF's Driving Forces cards—which summarise major long-term trends—help participants surface key pressures their organisations should monitor and spark shared discussion about forces shaping the future.

LOW

CTRL+ALT+FUTURE BY MINISTRY OF DIGITAL DEVELOPMENT AND INFORMATION (MDDI)

A fortnightly digest of emerging signals and technology trends, produced with minimal resources but valuable for raising awareness and sparking discussion.

GLOBAL STRATEGIC TRENDS
BY UK MINISTRY OF DEFENCE

A large project involving literature reviews, workshops, cross-government and international consultations with thousands of contributors, producing collaborative, long-horizon foresight to stress-test defence planning.

HIGH

STRATEGIC INTELLIGENCE
BY WORLD ECONOMIC FORUM (WEF)

An interactive platform combining curated research, expert input, and Transformation Maps—visual diagrams showing how global issues (e.g. AI, food systems, supply chains) connect to one another.

Resources Involved

Foresight projects do not all need massive budgets or teams. For example, projects could be a small newsletter, or a dedicated effort to translate insights found from reports online into strategy. These projects can be independently or collectively done. They can require small or large data sets. They can take a short or long time, based on your needs, resources, and speed of change in the domain examined.

Recognising the resource helps us avoid being daunted by scale or feeling we must get everything right first time. Done is better than perfect, and moreover improvements can still come from iteration. Work with what you need and what you have.

Elaboration can be found in **Section 2b**.

WORLD ENERGY MODEL BY SHELL

Shell's World Energy Model is a long-range numerical model that simulates global energy demand, technology choices, and supply to 2100. It integrates economic drivers, engineering constraints, prices, and behavioural preferences across over 80 countries to generate quantitative scenario projections.

QUANTITATIVE

MAKING OUR FUTURE: NEW DIRECTIONS FOR HUMAN DEVELOPMENT IN ASIA AND THE PACIFIC BY UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

The study explores development trajectories across Asia and the Pacific, one of the world's most dynamic regions, home to 60% of the global population, 34% of global GDP, and 48% of CO_2 emissions.

MODELLING FOR COVID-19 COLLEGE REOPENING DECISIONS BY CORNELL UNIVERSITY

Cornell used a SEIR-style simulation—tracking how people move from "susceptible", to "exposed", "infectious", and "recovered"—to test thousands of "what-if" reopening scenarios. This modelling evaluated testing, vaccination, and behaviour to guide safe campus operations under high uncertainty.

SYSTEMIC PRACTICE CONFERENCE BY HAYAA NETWORK

A cross-disciplinary conference on neurodiversity, mental health, and inclusive practice, blending keynotes, workshops, and dialogue to reframe wellness through systemic, ecological, and neuro-affirmative perspectives.

QUALITATIVE

PARTICIPATORY BACKCASTING FOR RECONCILIATION IN CLAYOQUOT SOUND, CANADA BY STAKEHOLDERS OF CLAYOQUOT SOUND

In a community facing land-use conflict and economic inequity, Indigenous and non-Indigenous leaders co-created ideal future scenarios and pathways for getting there together.

Approach Used

See **Section 3c** for sensemaking tools that help integrate multiple approaches.

Page 138

Foresight methods range from quantitative (such as data models, forecasts, simulations) to qualitative (such as scenarios, participatory workshops, ethnography).

Every approach has both strengths and limitations. Quantitative approaches can create a sense of precision and scale, grounding scenarios in measurable trends. However, they can also narrow the frame of possibility—pushing attention toward futures that can be easily counted, modelled, or parameterised, while sidelining social, cultural, or emergent dynamics that are harder to quantify.

Meanwhile, qualitative approaches can make emotional and sensorial realities come through. However, because each description is specific to a participant, place, or moment, it can be hard to compare across cases or generalise.

Of course, mixed methods are also possible. Regardless, methods chosen affect both product and process immensely. Know what your choice of method (or methods) illuminates and hides.

Elaboration can be found in **Section 2b**.

FORESIGHT SEGMENTS AT WORK RETREATS

Short foresight segments embedded in work retreats are especially effective when there is a clear "landing point" or decision, connecting discussion to immediate action.

PRACTICAL

FUTURE DESIGN IN YAHABA TOWN
BY TATSUYOSHI SAIJO, KEISHIRO HARA, AND YAHABA TOWN GOVERNMENT

First piloted in Yahaba Town and later elsewhere, the Future Design process asks participants to roleplay as "Imaginary Future Generations", creating dialogue and consensus with today's citizens on long-term issues.

BUILDING RESILIENCE TO FLOODING IN WALES BY 2050
BY NATIONAL INFRASTRUCTURE COMMISSION WALES, ARUP, AND OTHERS

A long-term vision for a flood-resilient Wales, blending futures thinking, participatory workshops, and flood risk expertise. The project produced scenarios, principles, and actionable recommendations to make national policy and infrastructure planning resilient by 2050.

NOT HERE, NOT NOW: SPECULATIVE THOUGHT, IMPOSSIBILITY, AND THE DESIGN IMAGINATION
BY ANTHONY DUNNE AND FIONA RABY

This book examines how "impossible" artefacts and scenarios—objects that defy physics, reason, or convention—can expose hidden assumptions about reality.

EXPLORATORY

THE THING FROM THE FUTURE
BY SITUATION LAB

A card game encouraging players to imagine artefacts from the future, and through the object as a seed, consider what other traits that future has.

UNDERSTANDING FUTURES OF SCIENCE: CONNECTING CAUSAL LAYERED ANALYSIS AND PHILOSOPHY OF SCIENCE
BY VELI VIRMAJOKI

The article examines how philosophy of science mirrors Causal Layered Analysis (CLA), showing how myths, worldviews, and structural assumptions shape our ideas about science development.

Goal

Intended

See **Section 3d** for how goals shape strategic choices.

Page 144

Foresight projects vary in how directly they link to action. Some are designed to inform immediate strategy, like flood-risk foresight feeding Welsh government implementation. Others are reflective, inviting exploration without pressure for next steps, like The Long Now Project. Action-oriented foresight gives decision-makers concrete recommendations, while reflection-oriented foresight cultivates new mental models.

Both are vital: action without reflection risks superficiality, while reflection without action risks irrelevance. This axis matters because it clarifies the intended value of a project. Stakeholders should know whether to expect usable strategy, deep cultural shifts in perspective, or ideally a balance of both.

However, do not let bias for action overwhelm thoughtfulness. Exploration can help us better deal with moment-to-moment emergence also, which is a practical skill to have. Good acting works with good reflecting.

Elaboration can be found in **Section 2b**.

SETTING UP A FORESIGHT UNIT IN AN ORGANISATION

Establishing a foresight office builds ongoing capacity, processes, and culture. The emphasis is on institution-building and embedding futures thinking rather than producing a one-off deliverable.

TEACH THE FUTURE

A global educational initiative training students and educators in futures literacy. Its process-oriented value lies in nurturing the next generation's ability to imagine and plan for long-term change.

PROCESS

FORESIGHT CONFERENCE 2024 BY THE CENTRE FOR STRATEGIC FUTURES (CSF)

A gathering with an emergent schedule to surface diverse, emergent issues—relying less on predetermined agendas and more on enabling participant-led dialogue and collaborative learning.

REPORTS BY INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

The IPCC produces rigorously reviewed assessment reports that synthesise global climate science. These authoritative products become references for policymakers and negotiators worldwide.

PRODUCT

BUILDING PERFORMANCE REIMAGINED BY ARUP AND CHARTERED INSTITUTION OF BUILDING SERVICES ENGINEERS (CIBSE)

While Building Performance Standards are typically technical, Arup proposes a new take that asks questions on what "building performance" means in a changing world.

Emphasis Placed

See Statement 5 in **Section 1**, which also discusses the symbiosis between product and process.

Page 32

Foresight projects can focus not only on products (such as reports, models, or toolkits) but also on process (such as building networks, convening discussions, or starting a new foresight unit).

In practice, no product is divorced from process, since product and process are not separate, but symbiotic. However, being clear about where emphasis lies matters for expectations and evaluation: do participants walk away with a tangible artefact, or with new capacity and relationships?

This axis reminds us that foresight work requires balancing exploration, creativity, and relationships with the need to produce something concrete. Good process and product are both needed to make imaginations and insights richer and come alive.

USE THE FORAGE AXES TO FIND YOUR BEARING

The FORAGE axes describe where a foresight project sits and how it might differ from others.

Where might my project be in relation to other foresight projects I am aware of? Use the FORAGE axes to get some bearing. The same organisation may work across several points on the map as its questions, scale, or resources change.

What matters is not choosing the perfect position—there is none—but knowing what your chosen position entails. What might it facilitate or hinder? An approach might be good for provoking reflection, but some audiences might be particularly wary of provocations. You might be ready to provide rigorous analysis and synthesis, yet some audiences' attention is difficult to sustain. What particular kinds of trade-offs are at your feet, and what choices will you make?

For more reference and inspiration, we will take a detailed look at some foresight projects in the next section.

CASE STUDIES

This section takes a closer look at specific case studies, focusing on what each project did and how they did it. Should explanations of foresight-specific terms used be needed, they can be found in the glossary at the end of the publication.

Pay close attention to what was done at each stage, including who was involved, how, and why. Note how the various case studies have modified methods and tools to suit their needs.

Once again: many kinds of projects can be good, especially if they are mindful of the contexts they find themselves in. All projects can be what is most realistic, impactful, and meaningful, depending on what resources you have (or do not have) and who the projects are intended for.

Flux Range

How wide a horizon of possibility is the project exploring?

BOUNDED — PAGE 58

1 | Forward to School: Guidance for Reopening

PAGE 62 — EXPANSIVE

2 | Preposterous Futures

Output Modality

In how many forms will the project be expressed?

MONO-MODAL — PAGE 66

3 | Future of the Sea

PAGE 72 — MULTI-MODAL

4 | IPS Prism

Resources Involved

What level of time, money, and effort can the project draw on?

LOW — PAGE 76

5 | CTRL+ALT+FUTURE

PAGE 80 — HIGH

6 | Strategic Intelligence

Approach Used

What kinds of evidence, reasoning, or ways of knowing shape the project?

QUANTITATIVE — PAGE 84

7 | Making Our Future: New Directions for Human Development in Asia and the Pacific

PAGE 88 — QUALITATIVE

8 | Participatory Backcasting for Reconciliation in Clayoquot Sound, Canada

Goal Intended

Is the project designed to drive action, or invite reflection?

PRACTICAL — PAGE 92

9 | Future Design in Yahaba Town

PAGE 96 — EXPLORATORY

10 | Understanding Futures of Science

Emphasis Placed

What matters more: the journey or the destination?

PROCESS — PAGE 100

11 | Foresight Conference 2024

PAGE 104 — PRODUCT

12 | Building Performance Reimagined

Forward to School:

GUIDANCE FOR REOPENING

EDUCATION INTERNATIONAL (EI)

NOTES

BOUNDED EXPANSIVE

Guidance for safely reopening schools during the COVID-19 pandemic, centred on five pillars: Dialogue, Health, Equity, Well-being, and Trust, drawing from practices across over 50 countries.

WHO WAS INVOLVED?
EI in collaboration with global network of unions, educators, and governments.

WHEN AND WHERE?
2020, Global

WHY IS THIS CASE STUDY HERE?
During COVID-19, uncertainty was high even in the near term. This case shows how foresight can still guide decisions when the range of flux is bounded, be it by choice or by circumstance.

Context and Purpose

In the middle of COVID-19, Education International (EI), a federation of teachers' unions representing more than 32 million educators in 172 countries, wondered how education could continue. Not only had the pandemic forced schools to close, it also amplified existing inequalities around quality and access to education.

In that context, responses needed to be thoughtful and timely, despite prevailing uncertainties. To do this, EI tapped on its foremost resource: its worldwide network of educators. EI asked them for positive solutions contributing to providing guidance for reopening schools safely and reaffirming the broader values of equity, participation, and trust in education governance.

When it was finished, the *Forward to School* report became a repository of union practices across more than 50 countries. It offered practical recommendations for both the future beyond the pandemic, and for the immediate present during COVID-19 in which educators had to urgently act.

Method and Process

First, member unions were asked to submit short reports detailing their countries' strategies, challenges, and innovations for reopening schools after the pandemic forced them to close. Submissions were reviewed for commonalities and transformed into a synthesised report. What problems occurred frequently? What traits did effective responses share?

The synthesis was refined through consultations and alignment with international frameworks, such as the International Labour Organisation (ILO)'s conventions on social dialogue that safeguard teachers' and workers' rights to participate in decisions affecting their work.

Findings and Contributions

The report described five pillars, each of which was deemed critical for the safe and equitable reopening of schools:

1. Engaging in social and policy dialogue—such as through ongoing communication among governments, employers, and educators. Examples include Italy's virtual union rallies, and in Denmark where an EI member union met with the Ministry of Education to clarify emergency legislation on the first day of lockdown.
2. Ensuring the health and safety of education communities—such as provision of protective equipment, cleaning standards, and community-based testing. Ghana's mask distribution and South Africa's emergency sanitation schemes were cited as models.
3. Making equity a top priority—such as by addressing disparities in access to technology and safe spaces. Gambia's solar radio lessons and India's audio-based teaching were documented alongside programmes protecting girls and vulnerable students.
4. Supporting physical and emotional well-being and recovery—such as through psychological health initiatives including teacher support hotlines in Sweden and webinars in Costa Rica.
5. Trusting the professionalism of educators—such as by recognising that reopening worked best when teachers retained discretion over curriculum and assessment, as seen in the UK, Germany, and Kenya.

The pillars offered an actionable framework for decision-making despite the pandemic's uncertain nature and impact. Moreover, the project positioned the union as an active partner for systemic responsiveness and redesign, beyond advocating for members' labour rights. As unions and governments spoke, both sides better understood each other's roles in crisis management.

Forward to School is notable for both its acknowledgment of, and contributions to, its volatile present. In the absence of clarity during COVID-19, EI gathered weak signals from its global network, recognising each member union to be both an observer and a contributor. In return, once disparate observations had been organised, the report offered collective wisdom for educators to apply to their respective contexts. The report showed that frontline workers could be a rich source of signals, proving the value of participative foresight and effective communication in uncertain situations.

Preposterous Futures

CIVIL SERVICE COLLEGE APPLIED SIMULATION AND TRAINING (CAST)

NOTES

BOUNDED EXPANSIVE

A speculative exercise using preposterous futures and AI chatbots to challenge assumptions and stretch how a learning organisation imagines its strategic relevance in the face of AI disruption.

WHO WAS INVOLVED?
CAST, senior management and specialists across the Civil Service College.

WHEN AND WHERE?
2025, Singapore

WHY IS THIS CASE STUDY HERE?
The project shows how examining extremes in a wider range of possible futures can surface institutional assumptions clearly. It also demonstrates novel use of AI chatbots to facilitate the dialogical exploration of scenarios.

Context and Purpose

Preposterous Futures is a scenarios exercise conducted by Civil Service College Applied Simulation and Training (CAST), bringing together senior management and specialists across the organisation to engage in cross-functional deliberations on questions regarding long-term adaptability, value creation, and strategic relevance in the face of AI disruption.

Preposterous Futures asked participants to imagine how the landscape of learning and development in the Public Service might be disrupted by AI with radically different conditions for work, workplace, and workforce. These were explicitly framed not as predictions but as provocations to help the college consider how it might position itself and act. AI was both the topic and the medium: the scenarios described AI-infused futures, and custom chatbots then inhabited each world for participants to converse with.

Method and Process

In foresight, preposterous futures sit at the far edge of the **Futures Cone**, a framework that illustrates the range of possible futures. Although preposterous futures are often rejected for being perceived as impossible, this project used that very preposterousness to foster an imaginative space to challenge participants' assumptions about the future of learning and development in the Public Service. This facilitated the unlearning of incremental thinking—the tendency to uncritically apply old mental models to vastly different futures.

See Statement 2 in **Section 1** where the Futures Cone is discussed.

Page 13

The team began by working with internal stakeholders to surface five strategic questions around AI. These questions became the basis for four preposterous futures anchored in different AI applications which were amplified until they subverted familiar expectations (e.g. hyper-personalised learning, extreme skills quantification, AI custodians of public memory). "Preposterousness" made existing mental models, value assumptions, and dependencies more visible, and therefore amenable to productive discussion.

Each scenario was written using a common frame—Work, Workplace, Workforce. Work described what day-to-day tasks feel like. Workplace described how the institutional environment operates. Workforce described what roles, skills, and power relations have emerged. Certain features of each scenario (labelled "Precision Learning", "Deskilling Drought", "Red Team Reality", "Human-in-the-Loop") acted as conceptual handles participants could use when comparing worlds or relating them back to the present.

Scenarios were accompanied by personas with divergent worldviews and attitudes revealing how they might experience the future or reconcile contradictory tensions in daily life. The human perspective brought granularity to potentially abstract technological paradigms, illustrated the diversity of lived experience, and surfaced surprising tactics or second-order impacts.

Participants were then invited to interact with chatbots that embodied each scenario through snapshots of daily life based on the questions asked. While prompts were offered to kickstart the conversation, participants were encouraged to devise their own questions, drawing from their experience and expertise.

ABOVE
Future personas of characters inhabiting the scenarios.

Findings and Contributions

The project yielded three methods insights.

First, it showed how preposterousness can be a structured unlearning device. By tethering wild futures to a stable narrative frame (Work—Workplace—Workforce) and to concrete strategic questions, the scenarios remained legible enough for institutional use, while stretching imagination beyond the incrementalism of "business-as-usual plus AI" to consider the need for deeper transformative shifts.

Second, personas helped concretise abstract ideas into human-scale impacts and revealed blind spots in how participants might typically approach such issues. The personas also provided a mask, an alibi for participants to raise questions or ideas from a persona's point of view which might not have surfaced otherwise.

Third, it demonstrated how chatbots could be used as foresight product. In addition to reading the scenarios once through, participants could interact with them and extrapolate them in unexpected ways across different domains, scales, and perspectives. This conversational engagement created detailed, user-generated micro-stories, collectively forming a shared dataset of feelings, images, edge cases and questions that could be further explored.

See **Section 3c** for other ways to surface and challenge assumptions, such as through crafting scenarios.

Page 138

See **Section 3e** for more creative ways to present foresight work for sparking conversations.

Page 152

Future of the Sea

UK GOVERNMENT OFFICE FOR SCIENCE (GO-SCIENCE)

NOTES

MONO-MODAL MULTI-MODAL

A government report examining the UK's long-term relationship with the sea, highlighting structural issues and identifying evidence-based recommendations for marine futures.

WHO WAS INVOLVED?
GO-Science, expert advisory group, research partners, and marine-sector stakeholders.

WHEN AND WHERE?
2018, United Kingdom

WHY IS THIS CASE STUDY HERE?
The project produced a single output—a traditional report that was evidence-rich and built on expert reviews and consultations, but also transformative in reframing the sea as a globally crucial space of uncertainty, interdependence, and importance.

Context and Purpose

Published in 2018 by the UK Government Office for Science (GO-Science), *Future of the Sea* aims to inform Britain's long-term maritime strategy by studying why the sea matters to the nation, how it is changing, and what those shifts entail.

Sea blindness—the invisibility of the ocean in public, political, and economic life—was a key motivation. Although oceans cover over 70% of the Earth's surface, the ocean floor is far less mapped than the surface of Mars. Understanding the sea is especially important for the UK which, with its Overseas Territories, has one of the world's largest maritime Exclusive Economic Zones.

Although the report was written for UK policymakers, it draws from data globally and built on international frameworks such as the United Nations Convention on the Law of the Sea (UNCLOS) and the Arctic Council. The report emphasised that the sea should be understood as a single system with many interdependencies; therefore international cooperation was key to its proper governance.

GO-Science's project was to create a coherent picture of the sea, culminating in a report containing a wide range of information and recommendations.

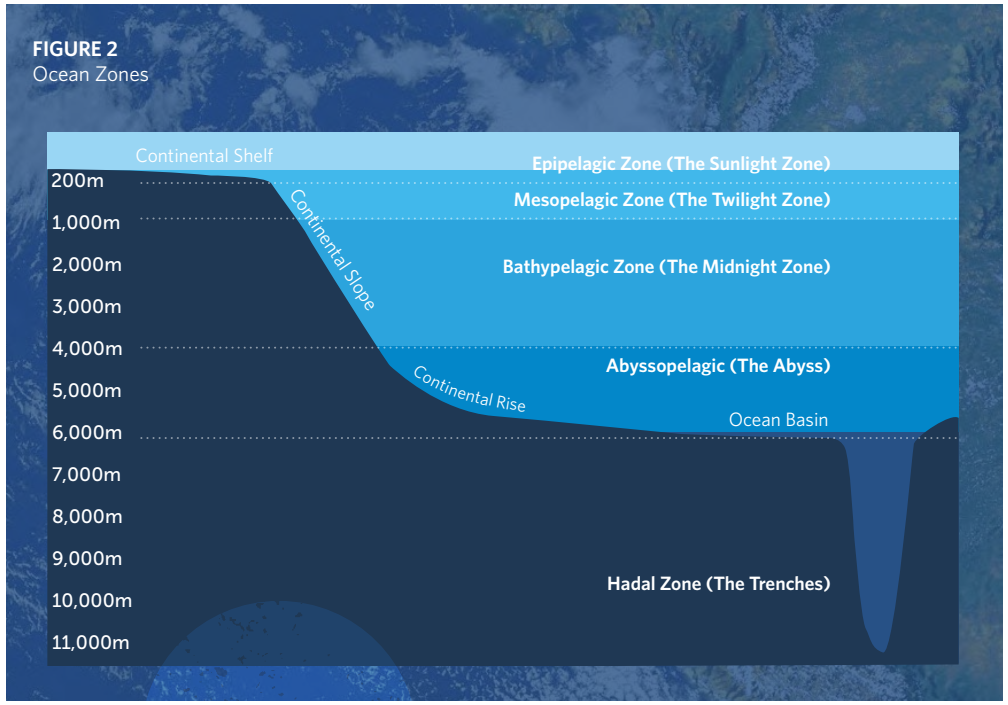


FIGURE 2
Ocean Zones

ABOVE
Found in the *Future of the Sea* report, this figure illustrates Ocean Zones based on depth, providing context for the discussion on the limited mapping and understanding of the deep seafloor.

Method and Process

The process involved complementary parts: evidence synthesis, expert consultation, and stakeholder engagement.

+ Evidence synthesis—commissioning 11 peer-reviewed Evidence Reviews written by subject specialists and externally reviewed for quality. The topics covered included ocean acidification, offshore infrastructure, and the marine economy.
+ Expert consultation—convening scientists, economists, defence analysts, and policymakers to test findings, reconcile assumptions across sectors, and look into cross-disciplinary dependencies.
+ Stakeholder workshops—engaging marine businesses and coastal communities in regions such as the Humber, North Wales, and East Anglia to capture local experience of infrastructure, employment, and climate risks.

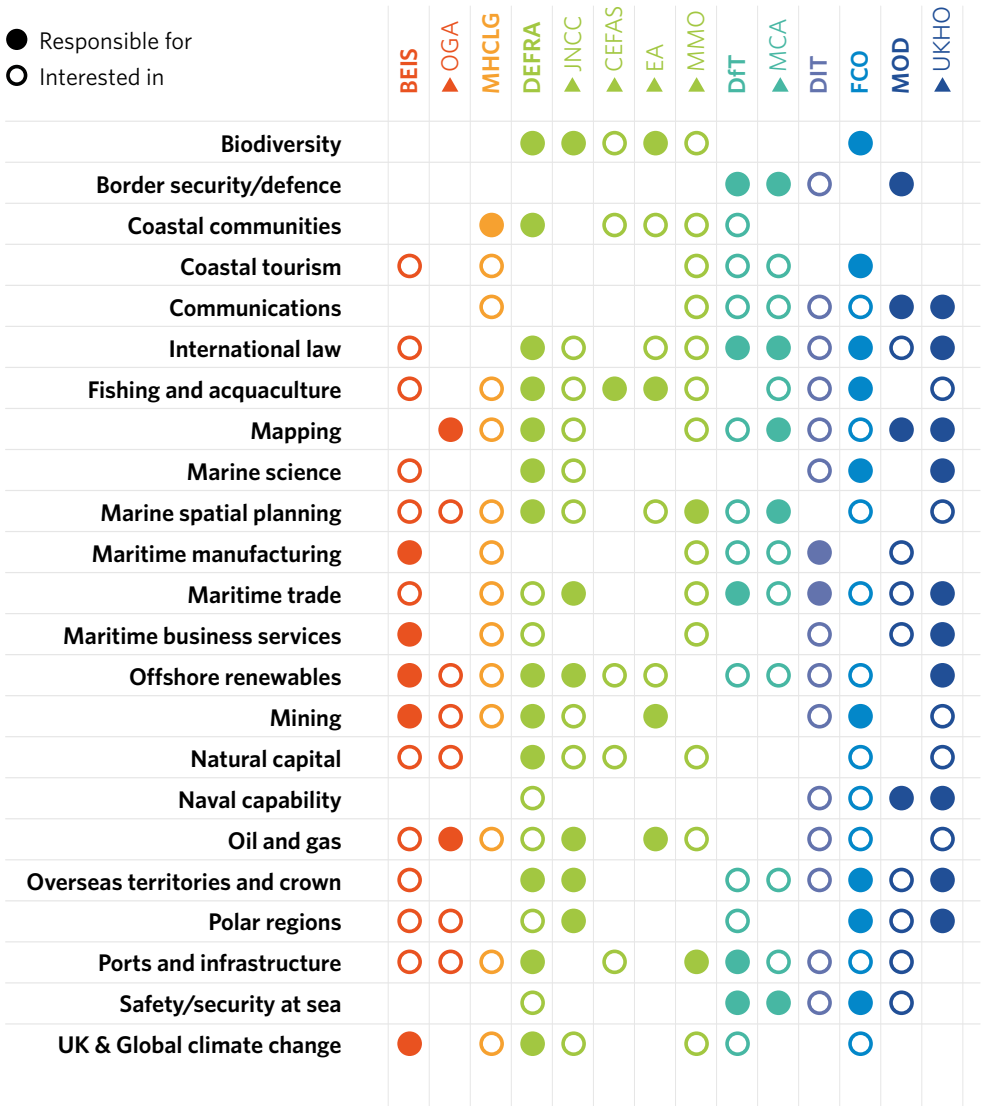
These contributions were then organised into four overarching domains—the economy, the environment, international engagement, and marine science—for a shared foundation of coordination across the UK government.

Findings and Contributions

The study identified structural issues that make the sea especially challenging to govern:

+ Sea blindness—a widespread lack of public and policy awareness of the sea's importance, leading to underestimation of both opportunities and risks.
+ Coordination—overlapping responsibilities and interests across government, industry, and academia, requiring stronger mechanisms for joint action.
+ Long-term decision-making—the mismatch between short political cycles and the deep-time dynamics of marine systems and investments.
+ Global interdependence—the need for international cooperation, as nearly all marine issues cross national boundaries.

While prediction works when patterns hold, foresight helps when they break, as is likely to happen given how interconnected



ABOVE
An example of stakeholder interest mapping as found in the report, which is one way to understand the different parts of a system and their connections. Try mapping your stakeholders' roles and interests in a similar grid!

A stakeholder map can be handy reference when analysing implications and developing strategies. See **Sections 3c and 3d** for more.

Page 138
Page 144

yet rapidly changing, even seemingly contradictory, the concepts of the sea can be. For example, on the one hand, the global ocean economy had been projected to double to around US$3 trillion by 2030, driven by renewable energy and advanced materials. On the other, coastal communities were being threatened by accelerating biodiversity loss and ocean warming.

In its executive summary, the report listed 20 recommendations spanning four broad categories: scientific capacity and data; economic opportunities; environmental sustainability; and governance and strategy. Each recommendation was directed to relevant departments such as the Department for Environment, Food and Rural Affairs (Defra), Department for Business, Energy and Industrial Strategy (BEIS), and the Department for Transport. The report concluded that the country's success as a maritime nation would depend less on new technology and more on improved alignment across departments, data systems, and long-term commitments.

Although foresight projects can play with multiple formats, Future of the Sea rests on a single modality of the report, which for some people and purposes remain the most suitable format. It reminds us of how broad, deep, yet accessible a report can be: comprising analysis that considers both quantitative and qualitative data, recommended actions for a wide range of stakeholders, and visuals that scaffold the reading experience.

IPS Prism

INSTITUTE OF POLICY STUDIES (IPS)

NOTES

MONO-MODAL **MULTI-MODAL**

A public foresight project exploring Singapore's governance futures via workshops, arts-based scenarios, culminating in an exhibition and survey of political attitudes.

WHO WAS INVOLVED?
IPS, Cognitive Edge, and seven sectors: academia and public intellectuals; arts, culture and media; business; civil society; new citizens; Singapore Public Service; and young Singaporeans.

WHEN AND WHERE?
2012, Singapore

WHY IS THIS CASE STUDY HERE?
This participatory project was multi-modal in its output, comprising scenarios, forum theatre, arts installations, and surveys. The project also showed how past scenarios can be revisited for learning regardless of predictive accuracy.

Context and Purpose

The Prism project was launched by the Institute of Policy Studies (IPS) in 2012. They followed Singapore's General and Presidential Elections in 2011, which were considered a watershed: voters increasingly expected political pluralism and questioned long-held assumptions around governance.

In that milieu, Prism explored how Singapore's politics and polity were changing by:

+ Identifying the choices and challenges Singapore might face as a small, global city-state.
+ Examining how governance could become a shared process between government, citizens, and leaders across sectors.
+ Producing plausible scenarios showing how emerging tensions around trust, participation, and inequality might shape Singapore's future.

While grounded in Singapore, Prism drew on comparative studies of small states and governance transitions in Asia and beyond. Prism's thematic scope—social inequality, governance, civic participation, media, and welfare—made it both a reflection of national issues, and contribution to global debates on how small states balance domestic and international affairs.

Approach and Methods

Prism happened in three phases that combined research, dialogue, and artistic engagement.

Phase One consisted of scenario building workshops, convened with participants across sectors such as youth, civil society, arts and media, and new citizens. Across workshops, participants discussed a range of driving forces,

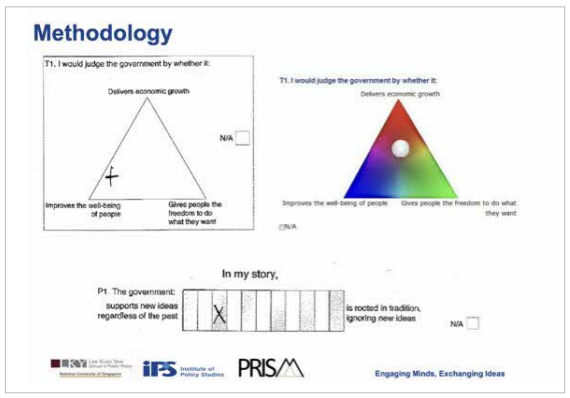
and selected three they found central to Singapore's next decade:

1. Credibility of government—the level of public trust or distrust in state institutions.
2. Society's definition of success—whether they were oriented toward material rewards or moral and communal well-being.
3. Distribution of help and rewards—whether policy benefits privileged "the winners" or served "the rest."

After selecting the driving forces, participants built scenarios around them.

Phase Two comprised immersive arts experiences, created by IPS and theatre group Drama Box. An exhibition at the National Library presented the scenarios as an interactive installation where visitors could vote on the futures they preferred and share how they felt. Drama Box also ran forum theatre sessions, allowing audiences to act out alternative responses to the situations presented.

The final phase gathered more than 600 stories through a "narrative-capture" survey designed by The Cynefin Company (formerly Cognitive Edge). Respondents told short stories about their imagined lives in ten years, and mapped where in a triad of values—economic growth, moral direction, and freedom of choice—their stories fell. The results, presented at a major IPS conference in 2013, showed how citizens viewed governance, solidarity, and success.



ABOVE Snapshot of a set of questions used in Phase Three—the IPS Prism Survey.

RIGHT
Images of the Forum Theatre workshop's final exhibition, as featured in the *IPS Prism Report*.

Findings and Contributions

Three scenarios were created with participants:

1. "SingaStore.com" envisioned a pro-business technocratic state where high growth coexisted with inequality, raising questions about social sustainability.
2. "SingaGives.gov" depicted a redistributive and welfare-oriented society, raising questions about inclusiveness and fiscal sustainability.
3. "WikiCity.sg" imagined a decentralised, self-organising society with weak central authority but strong civic networks.

See **Section 3e** for how multi-modal formats broaden engagement.

Page 152

Certain tensions emerged repeatedly: between trust and scepticism in government, economic performance and social equity, and individual initiative and collective responsibility.

The scenarios built in 2012 were not treated as forecasts but as frames for reflection. Revisiting them years later showed how past foresight work can continue to generate learning, regardless of how closely events match the narratives.

Beyond content generated, Prism's contribution was also in its methodology. For IPS, Prism was a peer-to-peer process for fostering political maturity, in which a range of modalities allowed for many expressions to emerge: micro and macro, personal and communal, values-based and interest-based, and more. The project combined academic research, participatory arts, and qualitative data, showing that there is no single right way to do foresight—especially for meeting people where they are.

CTRL+ALT+FUTURE

MINISTRY OF DIGITAL DEVELOPMENT AND INFORMATION (MDDI)

NOTES LOW HIGH

A fortnightly newsletter sharing themed signals on emerging technology and implications for government.

WHO WAS INVOLVED?
MDDI's Smart Nation Strategy Office and National AI Group, and guest contributors from across the government.

WHEN AND WHERE?
Ongoing, Singapore

WHY IS THIS CASE STUDY HERE?
This demonstrates how a resource-light foresight product can sensitise many to futures thinking, seed inquiry, and embed scanning practices into everyday work while reaching a wide audience.

WEAK SIGNALS
Early, ambiguous signs of change that may become significant over time. They help organisations anticipate disruptions and emerging possibilities before they become obvious.

HORIZON SCANNING
A systematic method for detecting early signs of change by identifying weak signals, emerging issues, and disruptions across multiple domains.

Context and Purpose
CTRL+ALT+FUTURE is a themed, fortnightly newsletter for the Singapore Public Service circulated by the Ministry of Digital Development and Information (MDDI)'s Smart Nation Strategy Office (SNSO) and National AI Group (NAIG), covering signals across emerging technology (including AI) and the digital space, with a focus on implications for government. Consisting of a short editorial foreword and write-ups of three to four related signals, the newsletter is intentionally kept short to enable regular production. Each issue takes a few hours to produce, and reaches a wide audience with limited resources.

Approach and Methods
Initially, the signals featured were unrelated. The team later found that grouping them thematically improved coherence and recall, enabled better planning, and facilitated responsiveness to world events. For example, days after the public release of Chinese open-source AI model DeepSeek-R1, *CTRL+ALT+FUTURE* published an issue on open-source software and its implications for government.

Occasionally, the newsletter features guest contributions from colleagues without foresight backgrounds. They are sensitised to foresight work over the course of producing an issue, showing that product and process are not separate, but symbiotic. Guest editors outside the SNSO Futures team may comment on signals related to their work; for instance, the team collaborated with one of MDDI's legal directors on an issue exploring technology and law. Guest posts have also spotlighted digital products within government, often

in the form of interviews with development teams. Past features include the Government Technology Agency of Singapore (GovTech)'s bot-builder tool "AIBots" and the Central Provident Fund Board (CPFB)'s internal AI-powered tool "ChatCentral."

In its current form, the SNSO Futures team works closely with NAIG's Government team to drive community engagement and outreach. The newsletter now has its own logo and design language, is distributed at optimal times for engagement, and tracks sign-ups and readership.

Findings and Contributions

The newsletter serves several functions.

+ Sensitising readers to futures work and emerging technology—it helps MDDI make sense of uncertain technological developments and seed ideas for further research. Editorials and signal write-ups include implications for government that challenge existing assumptions. For many MDDI colleagues, the newsletter is their first exposure to a futures product and provides a tangible example of such work. Its email address also serves as a simple contact point for colleagues to ask questions or contribute.
+ Supporting research and building networks—the newsletter's regular cycle acts as an accountability mechanism for ongoing horizon scanning. Issues often double as pre-reads for roundtables or deeper-dive discussions. They also inform the team's research—a particular issue's strong reception could be a sign for the team to dive deeper into that area.
+ Facilitating connections across government—inviting guest editors creates opportunities to connect with other divisions and understand their priorities, while spotlighting digital products fosters collaboration with GovTech and other agencies. For example, after GovTech's LionGuard moderation classifier was profiled in the newsletter, its developers were invited to present their work to a senior leader in MDDI.

See **Section 3b** for the full horizon scanning workflow, which underpins the approach in this newsletter.

Page 130

By combining regular scanning, thematic curation, and deliberate outreach, *CTRL+ALT+FUTURE* has evolved into more than a newsletter. It now functions as a lightweight but effective platform for surfacing signals, seeding inquiry, and connecting teams. Its wide circulation across government has helped normalise foresight as an ordinary, practical part of digital governance.

Strategic Intelligence

WORLD ECONOMIC FORUM (WEF)

NOTES LOW HIGH

A dynamic online platform visualising interconnections among over 250 global issues, offering continually updated briefings and data feeds.

WHO WAS INVOLVED?
WEF's Expert Network,
Global University Leaders Forum,
and hundreds of partner researchers.

WHEN AND WHERE?
Ongoing (launched in 2019), Global

WHY IS THIS CASE STUDY HERE?
This is an example of high-resource foresight infrastructure that is comprehensive, interactive, and continuously updated. It demonstrates how live, large-scale, data-driven platforms can function as a "living atlas" of change for decision-makers.

Context and Purpose

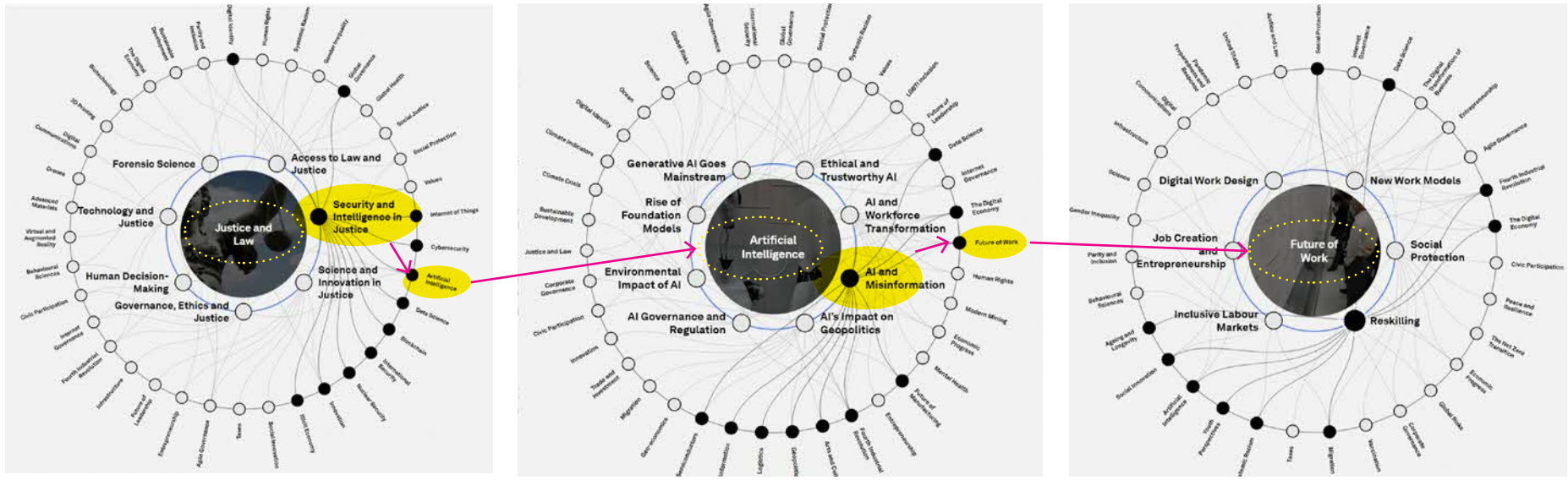
The World Economic Forum (WEF) launched its interactive Strategic Intelligence platform in 2019 to help leaders understand how global issues interconnect. Building on WEF's earlier *Global Risks Report* and *Global Competitiveness Index*, Strategic Intelligence is a dynamic knowledge system that constantly updates across hundreds of topics—from energy transition, to food security, to global health. By linking expert analysis, academic research, media coverage, and policy papers, users can trace the intersections and evolution of issues for themselves.

Approach and Methods

Strategic Intelligence operates through a networked model of curation. Content is developed by WEF's Expert Network of more than 900 subject matter experts and the Global University Leaders Forum (GULF) that consists of 29 leading universities worldwide.

The platform hosts more than 250 Transformation Maps devoted to topics such as hydrogen energy, supply chain resilience, youth mental health, or global tax reform. Each map organises knowledge as:

+ A live briefing written and periodically updated by subject experts.
+ A data feed of recent publications, datasets, videos, and commentary.
+ A relationship map generated through semantic analysis showing how the topic connects to others across domains such as technology, society, and climate.



RIGHT
Transformation maps with clickable nodes that connect related topics and content contributed by research institutions and media organisations worldwide. For instance, we can trace how a topic like "Justice and Law" can connect to "Artificial Intelligence", and even "Future of Work".

The platform uses semantic analysis and automated curation to connect related content across hundreds of Transformation Maps, helping users identify emerging patterns and relationships among global issues. Users can navigate these maps visually or by using filters such as themes, sectors, regions, and the United Nations Sustainable Development Goals (SDG).

Findings and Contributions

As of 2025, Strategic Intelligence has mapped more than 270 issues and 190 national or regional profiles. Its design performs several key functions:

+ Expanding accessibility and reach—translating complex research into concise, readable summaries available to policymakers, researchers, journalists, and the public. The visual interface makes systemic relationships, such as those linking climate, migration, and security, immediately legible.
+ Preserving evolving insight over time—continuously updated briefings make an implicit record of how global narratives shift, allowing users to track evolving priorities.
+ Integrating knowledge across disciplines—linking economic and social indicators with scientific and technological trends provides a foundation for cross-sector dialogue. For example, the Energy Transition map connects decarbonisation to labour markets, infrastructure investment, and critical minerals supply, framing energy transition as an issue that requires systems transformation to address.

Keeping the platform alive and updated takes immense effort: from the volume of information scanned and processed, energy spent by human and machine interlocutors, and the funding, technological, and coordination infrastructure to keep it all going.

The sum of all that work is a robust, living, and customisable ecology of knowledge for governments, businesses, and civil society worldwide. Strategic Intelligence is a shared map of change for users to trace connections across domains, otherwise often analysed in isolation, and to appreciate how everything is truly connected to everything else.

Making Our Future:

NEW DIRECTIONS FOR HUMAN DEVELOPMENT IN ASIA AND THE PACIFIC

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

NOTES

QUANTITATIVE QUALITATIVE

A regional report examining Asia-Pacific's development trajectories, combining quantitative modelling, inequality analysis, and scenario exploration to reassess growth, human development, and existential risks facing the region.

WHO WAS INVOLVED?
UNDP's Regional Bureau for Asia and the Pacific, with contributions by academics and consultants.

WHEN AND WHERE?
2024, Asia Pacific

WHY IS THIS CASE STUDY HERE?
This study successfully demonstrates data-informed foresight, grounding analysis in evidence while recognising the need to qualitatively sensemake uncertainty.

Context and Purpose

Making Our Future: New Directions for Human Development in Asia and the Pacific is the 2024 Regional Human Development Report (RHDR) by the United Nations Development Programme (UNDP). The study covers a region that accounts for 60% of the world's population, 34% of global GDP, and 48% of global CO_2 emissions.

The report responds to a decade of overlapping crises—pandemics, climate shocks, geopolitical tension, and slowing globalisation—that expose the limits of traditional growth models. It argues that Asia and the Pacific now stand at a crossroads: the region must adapt its historical paradigms of export-led growth and human development to the demands of a new risk environment.

Approach and Methods

Three risk clusters frame the analysis:

1. Existential threats—climate change and pandemics.
2. Structural transitions—demography, technology, and globalisation that challenge job creation and growth.
3. Governance risks—democratic backsliding, populism, and polarisation.

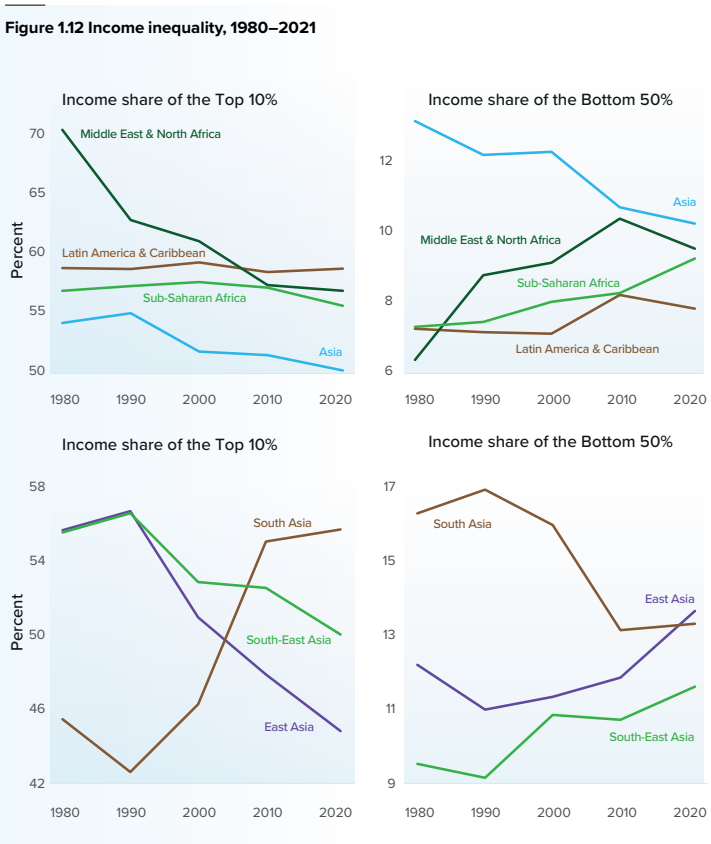
To address them, UNDP's Regional Bureau for Asia and the Pacific (RBAP) combined quantitative foresight methods with political-economy analysis, linking human development metrics to risk exposure and policy options. Techniques used include:

+ Composite-index construction, expanding the HDI through new measures—the Planetary-Pressures-Adjusted HDI, Gender Inequality Index, and Social Progress Index—to capture environmental and social dimensions of progress.
+ Correlation studies mapping how governance quality, innovation, and informality interact to influence productivity and resilience.
+ Scenario analysis to stress-test policy choices under possible futures, including pandemic recurrence, climate instability, and energy-transition risks.

RIGHT
These charts from the UNDP report show income share based on the World Inequality Database's DINA methodology.

DINA combines national accounts, surveys, fiscal records, and wealth rankings to reveal subregional and percentile-level patterns obscured by traditional aggregates.

Figure 1.12 Income inequality, 1980–2021



Findings and Contributions

The report confirmed the region's remarkable but uneven progress. Since 1990, while Asia and the Pacific's average HDI rose by 19%, some subregions stagnated or regressed after 2019. The Planetary-Pressures-Adjusted HDI showed that high-income economies sustain performance at significant ecological cost, while lower-income countries face trade-offs between growth and environmental integrity.

The report raised three items to prioritise:

1. Mainstreaming human development—expanding social protection, universal health coverage, and climate-resilient growth. Only 63% of the region's population is covered by healthcare schemes, leaving 1.6 billion people inadequately protected.
2. Recalibrating growth strategies—sustaining manufacturing while diversifying into services and green and ocean-based economies. Manufacturing continues to generate strong spillovers: every US$1 in manufacturing output is estimated to produce around US$1.5 in activity across other sectors, underscoring its enduring multiplier effects.
3. Making change happen through anticipatory governance—statistical evidence links governance quality to innovation outcomes, showing that institutional adaptability is a prerequisite for transformation.

How might economic growth yield unequal and unexpected consequences? The RHDR sought to answer the question by using scenarios to test the limits of current growth models, studying how they behaved under pressures such as climate change, automation, and ageing. After all, prediction works when patterns hold, but foresight helps when they break.

Participatory Backcasting for Reconciliation

IN CLAYOQUOT SOUND, CANADA

STAKEHOLDERS OF CLAYOQUOT SOUND

NOTES

QUANTITATIVE | QUALITATIVE

A participatory foresight process uniting Indigenous and non-Indigenous leaders to co-create normative futures for Clayoquot Sound in 2050.

WHO WAS INVOLVED?
Community leaders from Ahousaht, Tla-o-qui-aht, and Hesquiaht First Nations, local civic leaders, and researchers.

WHEN AND WHERE?
2017, Canada

WHY IS THIS CASE STUDY HERE?
This is an example of a qualitative foresight approach. Participatory **backcasting** and storytelling were used in Clayoquot Sound to build trust across divides. By combining dialogue and narrative, foresight work transformed into a site for social learning and reconciliation.

BACKCASTING
A planning method that starts by defining a desired future state and then works backwards to determine the steps, decisions, and conditions required to reach it.

See **Section 3d** where we explain backcasting further.

Page 148

Context and Purpose
This project took place in Clayoquot Sound, British Columbia, home to the Ahousaht, Tla-o-qui-aht, and Hesquiaht First Nations. A UNESCO Biosphere Reserve, the coastal region is home to some of the world's last old-growth temperate rainforests.

The site has also seen one of Canada's most protracted environmental conflicts. The region's First Nations communities, though rich in ecological knowledge and stewardship traditions, have long been marginalised from land-use decisions and economic opportunities. After earlier collaborations dissolved, few avenues remained for dialogue between Indigenous and non-Indigenous residents.

Against this backdrop, the project used participatory **backcasting** to build a sense of shared futures and to chart pathways toward reconciliation. Scenarios were stories where participants imagined what a sustainable, self-determined, and shared future might look like.

Approach and Methods
The project applied second-generation backcasting, a method for co-creating desirable futures and tracing collaborative pathways to reach them.

The project convened three participatory workshops co-designed with an informal steering committee of First Nations and civic leaders. Participants expressed themselves through storytelling, which was a culturally familiar way of relating for the Nuu-chah-nulth community.

Some questions they were guided by include:

+ What will Clayoquot Sound's economy look like in 2050?
+ What do we want for future generations?
+ How do we get there?

In mixed groups, scenarios of desirable futures were developed. The groups also formed policy pathways to be operationalised after the workshops by a group comprising First Nations leaders, local businesses, and government representatives.

Findings and Contributions

Participants developed four desirable scenarios of the region's economy in 2050:

1. Food and Energy Security—self-sufficient local production through renewable energy and sustainable aquaculture.
2. Diversified Tourism—longer-stay, high-value cultural and ecological tourism that benefits First Nations.
3. Technology-Driven Knowledge Economy—remote education and services rooted in sustainability.
4. Conservation Economy—natural capital conserved rather than mined, supported by payments for ecosystem services.

Six policy pathways for getting to the desired futures were also articulated:

1. Social and physical infrastructure—investment in community connectivity, renewable energy, and low-carbon transport, alongside social networks that strengthen cooperation.
2. Capacity building—training and mentoring youth in stewardship, technology, and entrepreneurship while improving education and health outcomes.
3. Partnerships with First Nations—recognising Indigenous jurisdiction and creating equitable, co-managed enterprises.
4. Political will for change—developing leadership and alliances committed to reconciliation and sustainability.
5. Conservation finance—establishing mechanisms such as reciprocity payments and the Ecosystem Stewardship Fee to fund restoration.
6. Safe housing—promoting affordable, energy-efficient homes built with local materials and labour.

RIGHT
Clayoquot Sound's old-growth rainforests boast trees over 250 years old, with exceptional cedars exceeding 1000, supporting high carbon storage and biodiversity amid logging and climate threats.

Six months after the final workshop, a regional summit established the Tribal Parks Allies Ecosystem Stewardship Fee. Tourism operators now contribute directly to First Nations' conservation work, and the remaining pathways continue to guide community planning for housing, education, and governance.

Given how strained relations between the government and Indigenous communities had been, storytelling—a method and medium familiar and respected by Indigenous communities—was central to communication. In the affective space that approach freed up, room was made for Indigenous and Western worldviews to coexist, for historical injustices to be faced, for acknowledging that just as many futures are possible, many versions of the past and present also exist.

In futures that are desirable and shared, formerly-divided communities find something new to work towards. As one Elder observed, "Each person holds a piece of the puzzle. We need everyone to bring this piece to the table to build the picture of the future."

Future Design in Yahaba Town

TATSUYOSHI SAIJO, KEISHIRO HARA, AND YAHABA TOWN GOVERNMENT

NOTES

PRACTICAL EXPLORATORY

A participatory foresight initiative helping citizens make intergenerational decisions about Yahaba Town's infrastructure and long-term development.

WHO WAS INVOLVED?
Yahaba Town residents and municipal staff, supported by researchers led by Tatsuyoshi Saijo and Keishiro Hara.

WHEN AND WHERE?
Ongoing (launched in 2015), Japan

WHY IS THIS CASE STUDY HERE?
It is a project with specific and action-oriented objectives, shifting mindsets and producing real policy change by embedding long-termism into local governance.

Context and Purpose

Yahaba Town in Iwate Prefecture faced a problem common in Japan: both its infrastructure and population were ageing. Utilities needed repair, but few were able or willing to do it. After years of conventional meetings that produced only short-term compromises, municipal director Ritsuji Yoshioka invited researchers led by Keishiro Hara, in collaboration with Tatsuyoshi Saijo and other colleagues, to test a new approach: Future Design.

Developed in Japan and inspired by the Iroquois ethic of "seventh-generation decision-making", Future Design asks citizens to deliberate not only as current residents but also as members of an Imaginary Future Generation (IFG) from 40 years ahead. The method has since been iterated internationally, but this case study will focus on its first two occurrences.

Approach and Methods

The first series in 2015 comprised five workshops co-designed by Yahaba Town Hall and Osaka University. To develop an integrated vision for Yahaba Town in 2060, about 20 participants were split into four groups: two represented the current generation and two acted as IFGs from 2060. Each group met separately for four sessions before holding a joint consensus-building meeting. Participants wore *happi* robes (traditional festival wear) to symbolise their "time travel", a costuming device to detach themselves from present-day limits.

In 2017, the method was applied for a second time in Yahaba, with another group, for another project: the Total Management Plan for Public Facilities and Housing. Instead of being only either present citizens or IFGs, the participants this time alternated roles.

FORMS

See Statement 1 where we elaborate on how "People have always thought about futures that are a long time away."

Page 10

Findings and Contributions

Changing perspectives between the present and the future shifted participant emotion and reasoning. Present-generation groups initially prioritised cost containment, such as keeping water rates low, but when both groups met, participants recognised the value of modest sacrifice today for future resilience.

The 2015 IFG groups also proposed imaginative, place-based ideas. These included a monorail looping around Nansho Mountain (a cultural landmark mentioned in Kenji Miyazawa's *Night on the Galactic Railroad*), a wellness town integrating health care and agriculture, and new forms of cultural tourism. They significantly shaped the final set of prioritised policy measures: more than half of the agreed priorities originated from IFG proposals.

In the 2017 sessions, citizens proposed reusing underutilised public buildings, expanding elderly housing, and linking infrastructure planning with disaster preparedness and regional cooperation. In this round, municipal staff acted as facilitators and graphic recorders for the first time.

Having conducted Future Design on multiple occasions, Yahaba Town established a Future Strategy Office in 2019 to institutionalise long-term, future-oriented thinking within municipal policymaking. The office reflects Yahaba's commitment to embedding Future Design principles in its governance practices. Since then, Future Design has spread to larger cities such as Suita, Kyoto, and Matsumoto, to discuss carbon-neutral policy, environmental planning, and urban design respectively. It has also been attempted internationally in Ho Chi Minh City and Wales.

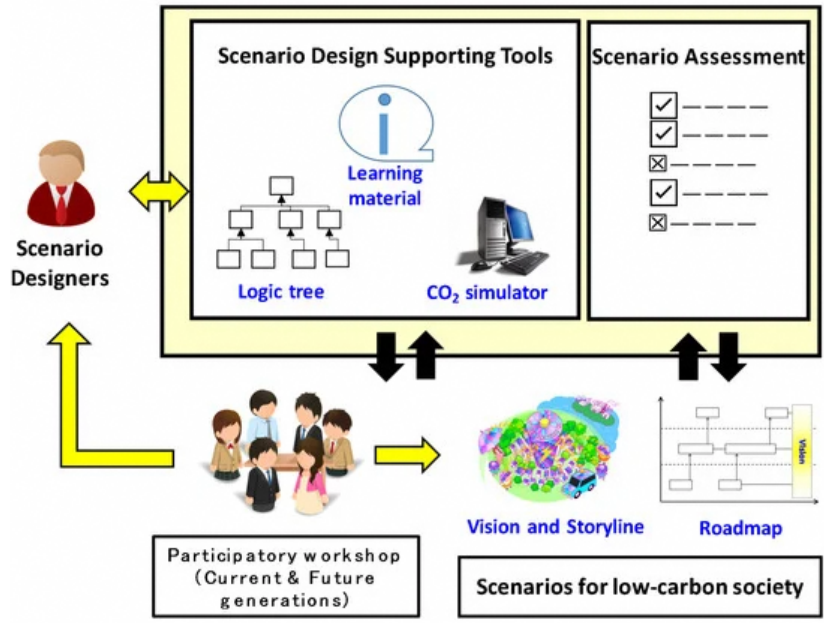
Yahaba's residents demonstrated that while not everyone is a foresight practitioner, everyone thinks about the future. By embedding the role of "imaginary future citizens" within government itself, Yahaba Town demonstrates how foresight can act as a social experiment in empathy and a mechanism for intergenerational equity, turning speculative dialogue into sustained, practical action.

See the steps of reviewing projects in **Section 3a**, to see how approach can be tweaked even as a project is ongoing, or through its iteration.

Page 126

RIGHT Participants don robes inspired by traditional happi robes to role play as Imaginary Future Generations (IFG). Here, Future Design practice is used again in 2023 for assessing urban planning in Yahaba town, implemented through cooperation between the town and Keishiro Hara's laboratory at The University of Osaka.

BELOW Another iteration of Future Design, in Suita City, had discussions supported by additional features such as quantitative simulations and learning material.



Understanding Futures of Science

VELI VIRMAJOKI

NOTES

PRACTICAL EXPLORATORY

A conceptual study linking Causal Layered Analysis (CLA) with philosophy of science, situating scientific paradigms and worldviews within futures studies.

WHO WAS INVOLVED?
Veli Virmajoki, Finland Futures Research Centre, University of Turku, Finland.

WHEN AND WHERE?
2022, Finland

WHY IS THIS CASE STUDY HERE?
It highlights something often overlooked: our ideas about "science" are not neutral. Reflecting on different philosophies of science—about how science progresses, what counts as evidence, or why discovery matters—reveal deep assumptions that influence how we conceive science and progress.

Context and Purpose

Foresight frequently produces roadmaps for research and innovation. Yet the question of what "science" means—and how that meaning varies across time, culture, or discipline—is rarely examined.

Philosopher Veli Virmajoki argues that this lack of reflection is a shared blind spot across both science policy and foresight practice. By combining **Causal Layered Analysis (CLA)**, a method developed by futurist Sohail Inayatullah, with insights from the philosophy of science, he shows how debates about scientific priorities rest on deeper worldviews and myths about what counts as progress.

Approach and Methods

Like an iceberg whose visible tip belies a larger chunk beneath, CLA understands visible phenomena to be shaped by what lies below. Virmajoki uses CLA to map how arguments about science operate across four layers:

1. Litany—headlines, debates, visible controversies.
2. Systemic causes—funding systems, institutional incentives, research politics.
3. Worldview—different philosophies of how science works and changes.
4. Myth and metaphor—deep stories: discovery as exploration, science as progress, a belief that large-scale scientific instruments can reveal deeper truths about nature.

By mapping each layer, Virmajoki shows that two people can refer to "science" but mean very different things.

CAUSAL LAYERED ANALYSIS (CLA)
A method examining issues across four layers—litany, systems, worldviews, and myths—to uncover underlying assumptions and reframe how problems and futures are understood.

See **Section 3c** where we explain Causal Layered Analysis (CLA) further.

Page 141

See **Section 3c** on "Becoming more aware of how thinking and meaning-making happens."

Page 140

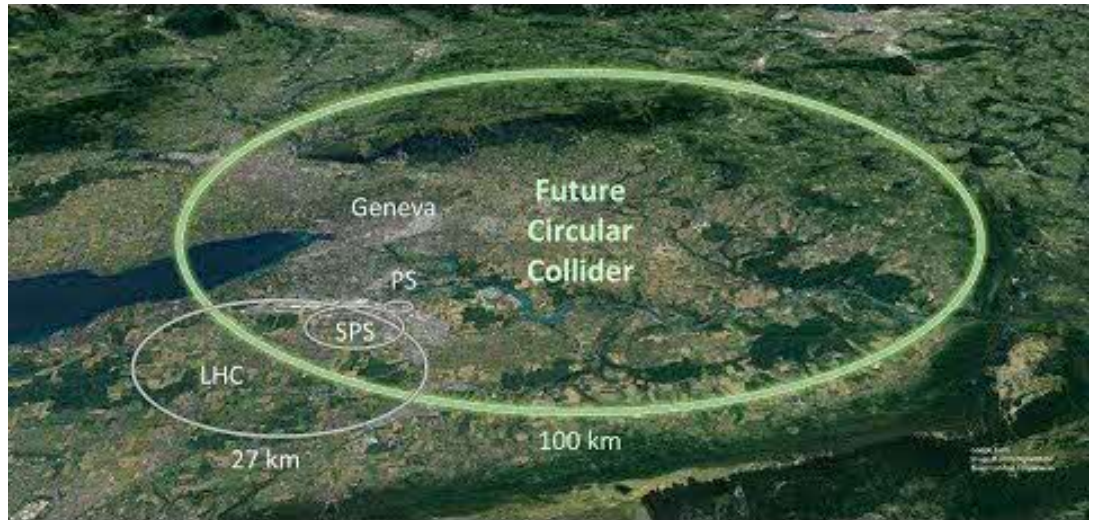
Findings and Contributions

As a case in point, Virmajoki analyses the public and professional debate around the Future Circular Collider (FCC), CERN's proposed successor to the Large Hadron Collider (LHC) that is expected to cost US$20 billion. Supporters and critics of the FCC both claim to speak for what science should be. Yet, when analysed through the CLA, the assumptions these positions are based on diverge at the levels of worldview and myth.

At the litany level, public discussion focuses on visible issues such as expense, uncertainty, and the possibility of a discovery drought in particle physics. Critics argue that large-scale projects may crowd out more socially urgent areas of research, while supporters emphasise international collaboration and the long-term technological benefits that such infrastructures tend to generate.

Moving into the worldview layer, the disagreements start to take on clearer philosophical shapes. Physicist Sabine Hossenfelder, for instance, argues that after the Higgs boson discovery, the chances of further breakthroughs are small, and scientific resources should shift toward problems where progress is more likely. This reflects a broader philosophy that values science for its problem-solving power and social relevance. By contrast, philosopher Michela Massimi defends the FCC on the grounds that exploration itself—even in the absence of new particles—produces scientific knowledge by narrowing the space of possibilities. In this view, even understanding where not to look is a meaningful contribution.

These different positions stem from deeper assumptions about what counts as scientific progress. Some traditions emphasise bold, testable predictions and empirical payoffs (associated with thinkers like Karl Popper); others highlight long periods of stable inquiry punctuated by occasional conceptual upheaval (à la Thomas Kuhn); still others assume that science gradually approaches truth through cumulative refinement. Each of these philosophies carries its own history and, crucially, its own implications for how we imagine the future of science.



ABOVE
Schematic satellite map of areas in Switzerland and France where the Future Circular Collider (FCC) will be built, forming a ring of 80-100 km—over three times longer than the 27 km of the Large Hadron Collider (LHC). Image taken by Panagiotis Charitos, CERN, in 2019.

Virmajoki's contribution is to show that these philosophical commitments shape real-world debates, whether or not participants recognise them. By mapping the FCC discussion across the layers of CLA, he demonstrates that disputes over funding or feasibility cannot be understood without acknowledging the underlying worldviews and myths that inform them. His analysis ultimately suggests that in science, just as many futures are possible, many versions of the past and present also exist. Each philosophical stance—Popperian, Kuhnian, realist—carries its own history of how knowledge changes, and those histories affect how we project science forward.

When research agendas are prioritised, which ideas of science and progress are invoked? In an age of technological solutionism, Virmajoki encourages us to reflect on what science should be, what it should strive for, and why it matters.

Foresight Conference 2024

CENTRE FOR STRATEGIC FUTURES (CSF)

NOTES

PROCESS | PRODUCT

A foresight event exploring alternative futures through a mix of keynote dialogues, unconference sessions, and collaborative glossary-building.

WHO WAS INVOLVED?
The CSF, international and local foresight practitioners, policymakers, academics, and creative partners.

WHEN AND WHERE?
2024, Singapore

WHY IS THIS CASE STUDY HERE?
This event emphasised process, using an unstructured, emergent design to foster open dialogue and participant autonomy. This approach allowed diverse ideas to surface and crystallise into shared language and meaning through a glossary co-created by participants at the end of the event.

Context and Purpose

Foresight Conference is a flagship event of the Centre for Strategic Futures (CSF), a foresight think tank in the Prime Minister's Office. Held regularly since 2011, the 2024 edition (FC24) was the first fully in-person gathering after the COVID-19 pandemic—a two-day, closed-door event conducted under the Chatham House Rule.

With about 50 participants, FC24 functioned less like a conventional conference and more like an extended workshop. It brought together civil servants, practitioners, and researchers from Singapore and abroad, spanning disciplines such as science and technology, sociology, psychology, philosophy, science fiction, community-facing work, and urban design.

In keeping with the embodied and entangled nature of complex problems, FC24's session design emphasised emergent conversation. Fixed agendas were kept to a minimum, giving participants the autonomy to shape discussions as they unfolded.

Approach and Methods

FC24's overarching theme—"A Season for Brave Ideas: Another ___ Is Possible"—pushed against prevailing pessimism to surface new and existing pathways to better futures. Three sub-themes anchored the programme: Another Architecture is Possible (representing the environments we inhabit); Another Belonging is Possible (living with our in-group); and Another Coexistence is Possible (living with those we see as out-group).

FC24 used a deliberately flexible format that prioritised participant agency and the spontaneous emergence of ideas. Minimal structure ensured that facilitation did not crowd out participants' interests and instincts.

Three types of activities shaped the conference:

1. Keynote events—designed to ground and provoke discussion. The opening lecture on Day 1 addressed geopolitics, technology, history, and economics, followed by a dialogue with a respondent and audience questions. A keynote workshop then shifted focus from the systemic to the personal, linking analysis with lived experience. On Day 2, a midpoint keynote conversation summarised the conversation thus far and drew connections between ideas, serving as both a survey and catalyst for further discussion.
2. Unconference sessions—scaffolded yet spontaneous. After the morning keynotes, participants proposed topics, which facilitators clustered into themes. Attendees then joined the conversations most relevant to them, moving fluidly between groups as ideas evolved.
3. Glossary-building exercise—an activity of consolidation and reflection. In small groups, participants distilled the conference's diverse discussions into a shared glossary of key terms and concepts, each with definitions and elaborations. The glossary did not seek consensus but provided an index of what participants spoke and cared about.

Throughout FC24, a team of "sherpas" was crucial in gently providing logistical and facilitative support. Sherpas acted as scribes and guides, responding intuitively to each group's needs without steering outcomes.

See **Section 3e** for the many possible reasons for, and ways of, engaging participants.

Page 152

Findings and Contributions

Participants observed that the unconference format embodied the dispositions foresight requires: adaptability, curiosity, and comfort with ambiguity. Rather than gearing toward a single output, FC24 demonstrated that the process itself can be a form of foresight practice.

FC24 showed that foresight is as much about how people gather to think as what they produce. FC24's experimentation with modular sessions and fluid discussion formats also seeded new relationships across the community and expanded foresight's collaborative reach beyond institutional boundaries.

FC24 eventually yielded a new product, a glossary of expanded ideas, showing that product and process are not separate, but symbiotic. More importantly, it left behind a spirit of curiosity and courage around what convening can look and feel like—broadening imagination for alternative formats and sustaining an ethos of experimentation in how difficult conversations are held.

Building Performance Reimagined

ARUP AND CHARTERED INSTITUTION OF BUILDING SERVICES ENGINEERS (CIBSE)

NOTES

PROCESS PRODUCT

A foresight study rethinking how building performance should be defined and measured in the future, integrating technical foresight methods into engineering practice.

WHO WAS INVOLVED?
CIBSE, with research and foresight led by the Arup University foresight team, supported by a wide cohort of expert contributors and CIBSE members.

WHEN AND WHERE?
2021, United Kingdom

WHY IS THIS CASE STUDY HERE?
This project emphasised its product—a document to stretch the imagination. The product then facilitated a process of sparking conversations in the built environment industry about standards, practice, collaboration, and training.

Context and Purpose

In engineering, "building performance" typically refers to quantitative standards of efficiency and safety around energy use, thermal comfort, ventilation rates, and structural integrity. However, Fiona Cousins, the president of the Chartered Institution of Building Services Engineers (CIBSE), argued that such metrics were not enough in a world of climate instability and social inequality. Engineers, she said, "must raise their eyes to the horizon and set broader design goals", since buildings shape ecosystems, culture, and human health.

CIBSE commissioned Arup's Foresight team to produce a document for stretching the field's imagination. *Building Performance Reimagined* is a hybrid between technical report and design fiction, reconsidering what building performance means through four interlocking metrics: Variety, Readiness, Connectedness, and Emergence. Each metric is elaborated through speculative blueprints to show what it might look like for future buildings to adapt to future demand.

Approach and Methods

The project unfolded through a three-phase process combining foresight and design methods.

The first phase scanned for the forces shaping future operating contexts. A horizon scan, structured around **STEEPLE** (social, technological, economic, environmental, political, legal, and ethical factors), mapped the wider shifts influencing how buildings are conceived and used. These insights were then refined through driver-mapping workshops with a multidisciplinary group of building services engineers and foresight analysts, who probed

FORMS

STEEPLE
A scanning framework covering Social, Technological, Economic, Environmental, Political, Legal, and Ethical domains. It structures and broadens attention beyond a single sector.

SEVEN QUESTIONS
First developed by Shell's scenario planning team, the method seeks to help people explore alternative futures, uncertainties, and key drivers of change using seven prompts.

which drivers were most critical or uncertain and how they interacted to form the emerging operating context for buildings.

The second phase explored what possible futures might emerge. Sixteen in-depth interviews were conducted with experts in neuroscience, technology policy, public health, economics, and industry. Using an adapted **Seven Questions** framework, interviewers elicited how new technologies, social values, and governance models could redefine building performance. These conversations informed a series of Design Futures Workshops led by CIBSE's Young Engineers Network, where early-career practitioners examined how shifting expectations—from users, regulators, and the planet itself—might transform professional practice.

The third phase considered what these futures implied for the building value chain and for building services engineers. Through backcasting, long-term visions were translated into near-term actions. In workshops with CIBSE's senior membership, participants connected aspirational ideas to current decisions, identifying practical steps to move the profession toward sustainable and regenerative outcomes.

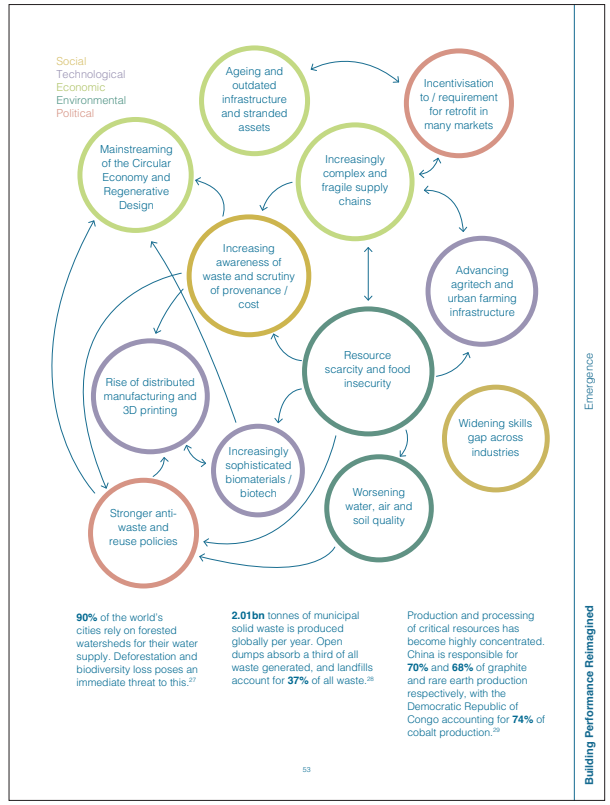
Findings and Contributions

The project proposed a new definition of building performance grounded in health and resilience rather than efficiency alone. It suggested four new metrics:

+ Variety—the flexibility and diversity of spaces and users, as found in neuro-inclusive and biophilic environments that support wellbeing and in buildings whose uses can evolve with demographic or lifestyle change.
+ Readiness—anticipatory capacity and risk resilience, enabled by digital-twin technologies that model multiple climate and occupancy scenarios, and by governance systems embedding adaptive maintenance and transparent data ethics.
+ Connectedness—integration with communities, infrastructure, and ecosystems, expressed through shared energy networks, mobility hubs, and blue-green corridors that link buildings to their local ecologies and social services.
+ Emergence—a circular, regenerative contribution to environment and society, achieved through material reuse, low-carbon procurement, and buildings that generate social value, such as community learning or health programmes, alongside environmental gains.

ABOVE
An infographic from the Emergence section of the report highlighting potential interrelated future scenarios.

Spanning the social, technological, economic, environmental and political domains, these scenarios emphasise the need to rethink infrastructure by adapting existing buildings to promote sustainability and support a circular economy.



Building Performance Reimagined has since become a reference point for ongoing dialogue. CIBSE plans to embed the framework in future guidance and awards, while Arup continues to promote its application through foresight and design networks. The report bridged foresight and professional practice, reframing how performance is defined while providing tangible recommendations to turn the new metrics concrete.

FORMS
See **Section 3e** for more examples of forms foresight projects can take, and considerations when creating them.
Page 152

THERE ARE MANY FORMS WHICH A FORESIGHT PROJECT CAN TAKE.

No project is complete, so pay attention also to the roads each project chose not to take.

In Section 2, we look at the many ways foresight projects can be understood, can look like, and can be done.

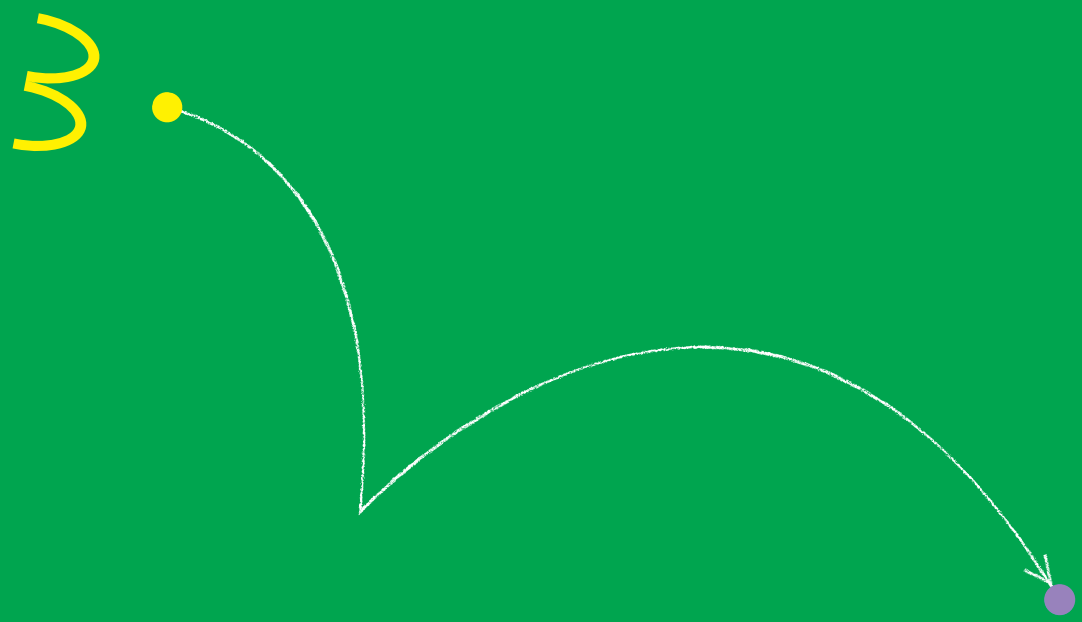
The FORAGE Axes in Section 2a show us the many shapes and approaches foresight projects can have—and do not need to have. Not every foresight project must look far into the unknown, be heavily-resourced, be sprawling in scope, or be both provocation and policy recommendation. Work with what you have, and tailor to who you are speaking to.

The 12 case studies in Section 2b should make clear the breadth of projects that can—and already do—exist. No project is perfect, but consider how each project chose and committed to their topic and approach, and what mileage they got for doing so. No project is complete, so pay attention also to the roads each project chose not to take.

While this section describes what foresight projects look like from the outside, the next section shares ways to build them from the inside. In Section 3, Footholds, we offer some heuristics to concretely help you start, and support you throughout, your foresight journey.

Section 3a offers some considerations in doing a foresight project, while Sections 3b to 3e suggest processes and principles that speak to different intentions and outcomes in using futures thinking.

Each organisation has different needs and may find certain approaches and methods more relevant for their circumstances at different points in time. Do what works for you.



FOOTHOLDS

Futures thinking can help with different things.

To ensure that your time and resources are used well, first identify why you want to think about the future and what you want this journey to help you with. Section 3a covers this.

This determines your approach and what value this process brings. In Sections 3b-e, we suggest how different objectives can be achieved.

Do this first, please

3a Start Here

Identify Objectives and Scope Your Project
Doing this will help you to design an approach that generates meaningful insights and conversations.

1. Establish intent
2. Set parameters
3. Work out resourcing
4. Review project progress

What futures thinking can help you with

3b Search for Signs of the Future

Uncover the What
Use horizon scanning to explore the dynamics of change and uncover patterns and connections.

+ Scan and pick up signals: what to look out for and how
+ Identify connections and patterns from signals gathered

1. Where to look
2. What to pick up
3. How to use what you have gathered

3c Make Sense of Possible Futures

From What to So What
Make sense of what shifts and multiple futures might mean for various stakeholders.

+ Organise and contextualise findings from scanning and research to your operating environment
+ Explore implications and possibilities

1. Become more aware of how we think and make meaning
2. Analyse implications and generate possibilities for a given topic
3. Consider which aspects of change are meaningful to you

3d Design Responses to Possible Futures

From So What to Now What
Translate insights to action: influence strategy by considering where you are relative to the changing environment.

+ Use insights to identify opportunities and threats, and build consensus on possible actions to take
+ Prepare for action by brainstorming and stress testing potential strategies, and working out next steps
+ Systematically monitor and evaluate uncertainties

1. Build consensus on what to address
2. Come up with strategy options
3. Explore and select what to implement

3e Bring Others Along

Inspire Others to Think About the Future
Introduce futures thinking to audiences, communicate insights to inform and garner interest in an emerging issue, and facilitate conversations about the future.

1. What might engagements be for?
2. What might engagements look like?

THE BEGINNER'S MIND

Section 3 comprises five types of Footholds that you may find handy in your foresight journey. The first and only one we ask that you read regardless of where your journey heads is our Checklist in Section 3a for getting started (or *re*started, if you are revisiting a previous exercise).

Why start here?
This Checklist was born from queries we often receive about embarking on a foresight project, as well as from reflections about preparing for foresight work both personally and from the community. Some colleagues call this "what we wish we had known before we started." We suggest project teams use the questions in the Checklist to identify what they know and what uncertainties about the project they face, especially if the uncertainty relates to the purpose of their project.

Shoshin wasuru bekarazu is a Japanese proverb that can be broadly understood as "never forget your original intent." The Checklist is organised into four steps starting with intent, which then becomes a reference point for scoping, resourcing, and exploring.

However, it is worth noting that a project's end is not likely to be fully known before it is begun, and new signals or developments could change the intent and trajectory of the project along the way. Therefore, we should actively consider why we are using foresight throughout our journey, so that we can change course should the need arise.

Where is the end—is there one? What happens after a foresight project is completed?
This really depends on what you consider "completed" to be (i.e. what the project objectives were). For example, some projects conclude with articulating the implications of multiple futures, while others go on to develop a preferred future or propose ideas for actions that can be taken. We offer some prompts in this section under "4. Review project progress" to help you think about what comes next.

Tip: You don't always have to start work from scratch.
The other Footholds in Sections 3b to 3e offer support based on different intentions using futures thinking. To that, we remind you that those who have come before you have wisdom to share.

Try using insights about the future generated by others. There may be organisations which have done projects related to the topic you want to examine. These project findings may not necessarily be foresight-focused, but can contain useful information such as explanations of concepts and observations about stakeholders and related sectors. Sometimes, there may also be data you can use to build future worlds, or signals that you can investigate further. An easy way to get started is to simply run a search for "future of <topic>" and see what comes up.

Read more about designing responses to possible futures in **Section 3d**.

Page 144

IDENTIFY OBJECTIVES AND SCOPE YOUR PROJECT

READ THIS IF YOU WANT TO KNOW WHAT TO CONSIDER WHEN EMBARKING ON A FUTURES PROJECT.

This section is a checklist comprising four sets of considerations:

1. Establish intent
2. Set parameters
3. Work out resourcing
4. Review project progress

START HERE

Being clear about your objectives, the context you are doing this in, and the stakeholders involved will help you to scope your project, design your methodology, and figure out the tools and frameworks to use.

+ If you have been asked to do a futures project, use this checklist to engage your project requestor. You can clarify what is being asked of you, manage expectations, or discuss what resources you can use.
+ If you are someone who has asked for a futures project, use this checklist to help you guide your project team or to engage other stakeholders.

While there is no single right way to do foresight, there are wrong ways. We hope that the questions put forth in this section's checklist can help you avoid those wrong ways. The right way is the one that bears your context in mind while balancing your needs and constraints reasonably. Only you can determine this balance. Others cannot make these choices on your behalf.

You may need to revisit some of these questions as you go along, and your answers to these may change too. That is completely okay. The point is to ensure that what you are doing is meaningful and helpful to you and your organisation at the end of the day.

PROJECT CHECKLIST

1. Establish intent

[ ] Why are you doing this?
[ ] What are the key questions you want to answer, or key decisions that this project will inform?
[ ] Who will use the insights you generate? How do you want them to use the insights?
[ ] Whose support do you have (or not) and why?

You can get started once you have ticked off the boxes on this page!

2. Set parameters

[ ] Time horizon: How far into the future are you looking?
[ ] Scale/depth of change: What kind of change are you looking at?
[ ] How will you balance product and process?
[ ] What tools do you want to use?
[ ] Timeline: How much time do you have to do this?

3. Work out resourcing

[ ] Who will work on this?
[ ] Who else will be involved and how?
[ ] Other resources

4. Reviewing project progress

[ ] Is your project achieving what it set out to do?

1/4 Establish intent

It is imperative that you start by understanding *why* you want to do a futures thinking project. This will also determine how you allocate your time and resources in your project.

Note that your objectives might be covered in multiple parts of this document, so pick and use what is relevant to you.

It is okay not to have the answers to everything when you begin, but your intentions must be clearly established before you do anything else. Answer parts (i)-(iv) before proceeding with your project.

Read more about what foresight is for in the Five Statements in **Section 1**, then use the overview of **Section 3** and Goal Intended in FORAGE **(Section 2a)** to think about what you want your project to help you with.

Page 8
Page 112
Page 51

i. Why are you doing this?
How do you decide if you need a foresight project? Is foresight what you actually want? Some good reasons for doing a foresight project include:

+ Challenging assumptions and mental models while making sense of change
+ Uncovering relationships and examining emerging issues holistically with long-term perspectives
+ Identifying and elevating strategic issues requiring attention
+ Shaping decisions by influencing agendas, policy, and actions
+ Building collective capacity by convening diverse stakeholders around complex (and potentially uncomfortable) futures

ii. What are the key questions you want to answer, or key decisions that this project will inform?
Articulate what the insights from this project will help you to know or do (e.g. understand how a trend could affect your organisation, make choices about which target group to design products for, etc). Everything in your project should always link back to these.

iii. Who will use the insights you generate? How do you want them to use the insights?
Your users could come from within your organisation or from outside of it (other stakeholders, sector players, citizens, general public, etc).

Consider:

+ What is their role in your context?
+ What might they do with the insights (for example, make a decision or implement an action in response)?

Use Statement 5 in **Section 1**, "Output Modality" in FORAGE **(Section 2a)**, and **Section 3e** to help you think about part (iii).

Page 32
Page 45
Page 152

iv. Whose support do you have (or not) and why?
Consider:

+ Whose idea was this and why did they initiate this?
+ Who is interested? Who could champion what you do?
+ Whose buy-in do you need for your foresight process and product(s)?
+ Who might be affected as a result of what you are doing and how?
+ Who does not believe in this and why? What concerns of theirs might you need to address?

2/4 Set parameters

Now that you are clear about your intent, you can get to calibrating the *how much* of your project.

The wider the range of changes you want to look at, the longer and more extensive your information gathering and analysis process might need to be. This is also likely to affect the time and effort required to select what to act upon and how later on.

Use **Section 3b** and Flux Range in FORAGE **(Section 2a)** to think about where and when change might happen, and therefore how far into the future you want to look.

Page 130
Page 43

We offer some considerations on using AI as a tool in foresight at the end of this book.

Page 162

i. Time horizon: How far into the future?
The definition of short-, medium-, and long-term is subjective and contextual. The amount of uncertainty explored in your project depends on what questions you have and what is helpful for that purpose.

Consider:
+ Speed of change—how quickly or slowly something is shaping or being shaped by the environment (e.g. automation of labour)
+ When effects are felt, and by whom (e.g. job displacement may be immediate, while traditional skills may decline over several generations)
+ Where you want to exert influence (e.g. retrenchment support or preservation of heritage businesses)

ii. Scale/depth of change: What kind of change are you looking at?
Change can look like many things. Are you interested in major shifts in geopolitics or the economy, changes in a local community or specific industry, or how the daily lived experience of certain groups is evolving?

Read more about products, processes, and foresight impact under Statement 5 in **Section 1**, then use Emphasis Placed in FORAGE **(Section 2a)** to think about what matters most in this journey.

Page 32
Page 53

Case Study 12 (Building Performance Reimagined) in **Section 2b** is an example of how different tools and frameworks were used in a foresight project at different stages.

Page 104

Read "Caring for your process" under Statement 5 in **Section 1** to understand how ringfencing time and spreading activities out can help make for a good process.

Page 35

iii. How will you balance product and process?
Consider:
+ What impact do you want to make with this foresight project?
+ Where will you devote more energy and time, and where will you spend less effort? How might this allocation help you to achieve your desired impact and objectives?
+ Product and process are not separate, but symbiotic. How would your product help your process, and vice versa?

iv. What tools do you want to use?
Like a craftsperson, your knowledge of and experience with tools and frameworks will influence your practice.
+ Plug and play—it may be easier for someone relatively new to foresight to start by following the steps from a course or toolkit.
+ Old hand—someone more familiar with established methods and approaches may be able to adapt or combine them with ease. It may take some experimenting to figure out what works for you.

v. Timeline: How much time do you have to do this?
Consider:
+ What is realistic and useful to cover with the amount of time you have (especially if this is not your main job role, or if you are doing this alongside other projects)?
+ How will you protect time and space for this project, as well as pace activities meaningfully?
+ How prepared are you and your stakeholders to compress or expand the timeline at various stages?

3/4 Work out resourcing

Consider what you have access to and who will be part of this experience based on your answers to "1. Establish intent" and "2. Set parameters." Different resources and people will be needed for different projects.

Find creative ways to do what you need to! For example, create depictions of the future in a Futures Bazaar by recycling "junk" materials into artefacts.

i. Who will work on this?
Consider:
+ How many project team members are there? Who will work on this from start to end?
+ Where are the team members from? What knowledge and skills do they bring? Do you need a diverse range of expertise and experience?
+ Is there autonomy to decide who will be part of the team? (if you are a lone ranger, that is fine too!)
+ Is there a project lead? How will the team be managed?

ii. Who else will be involved and how?
Consider:
+ What are your line(s) of reporting?
+ Other audiences—besides the target users (identified in "1. Establish intent"), who else will your work be shown to and where?
+ Other participants—besides the core project team, will others journey with you in this process, or will they participate at different stages for different purposes? (for example, you could consult experts as part of information gathering, or involve colleagues from other departments in brainstorming.)

You do not have to look only within your team or organisation. For example, people from partner agencies, community organisations, research institutes, or user groups could be potential participants in your project too.

Use "Resources Involved" in FORAGE **(Section 2a)** to help you think about the resources you might use in your project.

Page 47

Read more about Habits of Mind and futures functional competencies under Statement 3 in **Section 1**.

Page 21

iii. Other resources
Besides time and people, other types of resources you will need include:
+ What *capabilities* would you and your team need for the project? How will you equip your users to receive and understand the insights you intend to share with them?
+ How much *capacity* does your team and organisation have for exploring the future across the project duration? How important is your foresight project relative to other projects? Where do your users' tolerances for blue sky thinking lie?
+ Do you have *spaces* (both online and offline) where you can do your brainstorming, hold discussions, visualise things, etc?
+ Do you need or have a *budget* to do things?

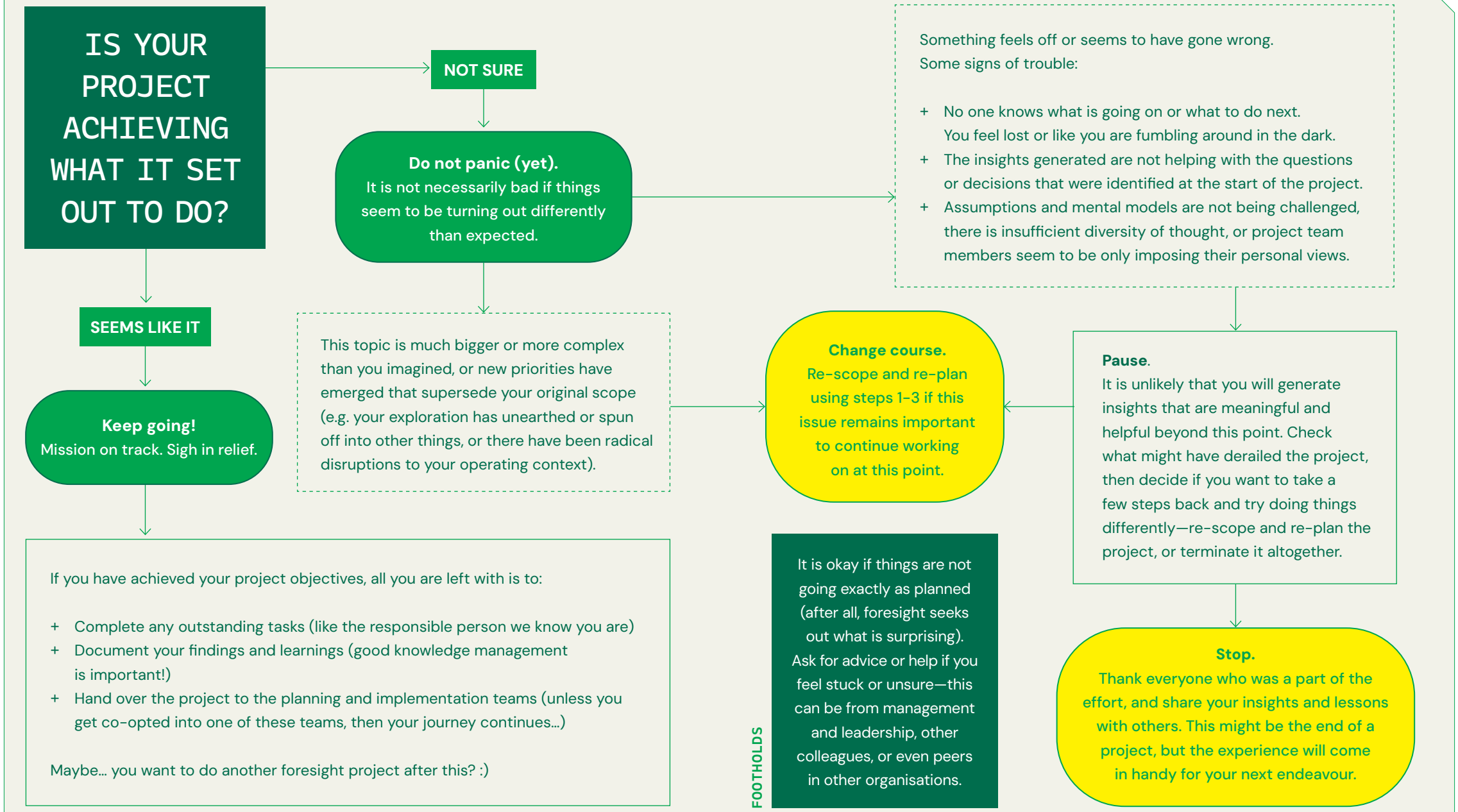
If you do not already have what you will need for your project, think about whether you should acquire missing resources and how you will do that. Otherwise, revisit your objective(s) and recalibrate your scope to work with what you have.

4/4 Review project progress

We often think about how to get started, but less so about how things might change along the way or end. How might you know if you are making progress?

See "What kinds of impact foresight can make" under Statement 5 in **Section 1** for some things you can look out for as your project progresses.

Page 36



WHAT COMES AFTER A FORESIGHT PROJECT?

Here are some prompts to help you figure that out:

Implement, Influence, Infuse

+ What follow-ups are needed?
+ Are there critical uncertainties to monitor?
+ Do you need to evaluate the project?
+ Should you tell others about your project? Why? (for example, to share findings and experiences; to inform or influence; to seek help)
+ Do you want to embed foresight into your organisation's processes?

From Foresight to Insight and Action to Foresight (again)

Examples of why an organisation might do another foresight project include:

+ Expansion pack—your last project uncovered new issues to study further, and these would benefit from using futures thinking. Or perhaps your last project created interest in other stakeholders to apply futures thinking to other issues.
+ v2.0—new signals have emerged that could change the range of possible outcomes and actions, so an issue and its strategies need to be revisited.

Use the Checklist to help you get things going again!

Page 118

Now that you are clear(er) about why you want to use foresight, you can embark on your journey proper.

Use the rest of this book—be it the Five Statements, FORAGE axes, case studies, or processes and principles—to help you with thinking about tomorrow.

UNCOVER THE WHAT

READ THIS IF YOU WANT TO KNOW
HOW TO DO HORIZON SCANNING.

Everyone does horizon scanning in their own way.
This section contains our suggestions in getting started:

1. Where to look
2. What to pick out
3. How to use what you have gathered

1/3

Where to look (collect information)

WEAK SIGNALS
Early, ambiguous signs of change that may become significant over time. They help organisations anticipate disruptions and emerging possibilities before they become obvious.

Horizon scanning refers to systematically picking up weak signals (not general trends or descriptive facts) for the early discovery of potentially significant changes.

The emphasis is on weak signals, unexpected connections, and other developments. It also includes the consideration of possible wildcards—low probability, high impact events with a surprising character.

To begin, ask yourself what are you scanning for and why. Define the research question first, then find the sources. Consider how understanding these things might be helpful to you or your organisation.

The purpose of horizon scanning is to surface signals and uncertainties, not to predict outcomes. Therefore, your question should invite exploration.
Bear in mind:

+ Your question should open up the landscape of change, not close it down.
+ Calibrate the scope of your question. Too broad and you drown in noise. Too narrow and you might miss early or emerging signals.
+ Expect to revisit and refine your question along the way, especially as you learn new information.
+ Frame your question around broader systems of change rather than a narrow sector. This allows for cross-domain exploration and thinking.

Where is change happening?
Two frameworks that can help you to think about this are **STEEPLE** and **Pace Layers**. They remind us that change can happen in many and different places.

If your research question is about urban mobility, using the technological and legal lens from STEEPLE, an example of where you might look could be whether

2/3

What to pick out (collect information)

STEEPLE
An analytical framework, short for social, technological, economic, environmental, political, legal, and ethical.

PACE LAYERS
A framework by Stewart Brand that uses layers to show how different aspects of a system change at different speeds.

the number of applications for licences to operate autonomous vehicles is changing.

What modes and sources of information do you have or will you need access to?
A low-effort, low-cost way to start is by subscribing to readily available content. You can use aggregators to curate a feed or follow interesting accounts on social media.

Look for thinkers in various fields who can offer interesting and alternative views. They may come from all walks of life and can be found in different places such as blogs, social media threads, videos, podcasts—even lurking in comments sections.

Cast your net wide first and after some time, you will have a better sense of what you find more useful and interesting. Remember to regularly update (read: weed) your list of sources!

The right spread
If you intend to do horizon scanning not just for a single project, but on a regular basis, think about how you would balance your efforts between deepening your understanding of certain topics and ensuring you keep a broader system in mind. One approach might be to prioritise a few "beats" or "threads" to pay closer attention to, and to involve others in the horizon scanning process so that you can build shared knowledge.

THREE HORIZONS
A framework that presents change as an interplay of what is dominant but declining, what is emerging, and the intermediate space of innovation.

CIPHER
A framework by Amy Webb that can be used to identify trends, short for contradictions, inflections, practices, hacks, extremes, and rarities.

Marshall McLuhan's **tetrad of media effects** can be adapted to think about change more broadly by asking "What is being...
... enhanced?
... reversed?
... retrieved?
... obsolesced?"

What might change look like?
Change happens in different ways. The **Three Horizons** and **CIPHER** frameworks offer some ways to think about how a change occurs—across time, and in various directions.

What do good weak signals look like?
Ask:

+ Would this surprise most people in your organisation or sector? Does this make you uncomfortable or raise an eyebrow?
+ How is this a potential discontinuity from or outlier to established patterns and narratives? Can you see a plausible (even if uncertain) path to this mattering significantly for what you do or your organisation does?
+ Does this have temporal relevance (neither already influencing current operations nor speculation)? Is this concrete and observable?
+ Are you seeing this in multiple unconnected places or contexts?
+ Does this hint at deeper shifts (e.g. values, power, systems)?

The art of horizon scanning and signal hunting lies in maintaining the right balance—being sensitive enough to capture genuinely novel signals, and yet discerning enough not to be overwhelmed by noise or distracted by irrelevancies. (By the way, the absence of change can also be surprising!)

3/3 How to use what you have gathered (processing data, producing insights)

See **Section 3c** for more on using the Alternative Futures framework and Futures Wheel in sensemaking.

Page 143

Refer to the infographic in Case Study 12 (Building Performance Reimagined) in **Section 2b** for an example of how the relationship between changes can be mapped.

Page 107

Signals can be used to understand how different parts of complex issues and systems relate to each other, and discover less obvious connections that could lead to disruptions.

Connecting signals through *consequences*

Some ways to brainstorm possible consequences of a signal include using the **Alternative Futures** framework or creating a **Futures Wheel**.

Imagining how a signal could play out and visually mapping the consequences allow for conversations about how pathways might reinforce or work against each other, including in unexpected ways, as well as seeing how effects in different domains could cross into each other.

Connecting signals through *affinity*

Signals can point to larger change when considered together. If a group of signals moves in the same "direction", they may be part of a larger driving force that could have continued effects on the future.

One way to derive driving forces is to group signals based on their relationships to each other. Some signals naturally go well together, while others may be indirectly related. Likewise, driving forces can also be combined in different ways to reveal new and unexpected connections and possibilities.

See **Section 3e** on what engagements can be for and what engagements can look like.

Page 152

Refer to Case Study 5 (CTRL+ALT+FUTURE) and Case Study 6 (Strategic Intelligence) in **Section 2b** for examples of how signals can be shared.

Page 76
Page 80

See **Section 3c** for more about analysis and interpretation of change.

Page 138

Signals can also be used to generate conversations about change and action.

You can bring attention to issues that might not currently receive attention, explain why someone might be unprepared for something, or help others to see what might already be here and could affect them soon.

First, describe individual signals objectively.

+ What kind of change (or non-change) is this signal about?
+ How is it a recent small or local innovation, with the potential to disrupt the status quo and/or scale in size or geography?

Next, interpret the signals.

+ What was surprising (or not)? How did you pick this signal and why did you pick it?
+ What might happen as a result?
+ Who is interacting with this signal, and how might they be affected?

TIPS ON HORIZON SCANNING

Diversify your sources and methods
Expanding what and how you scan

+ Subscribe to alerts or newsletters on related topics.
+ Look up your topic in different languages to help you find more content and other thinkers.
+ Different types of sources are useful for uncovering different types of insights. For example, you might look in journals for academic research findings, online forums for sentiments, self-publishing platforms for commentaries and ideas that are work-in-progress, or speak to those in the know for informal intelligence.
+ Feeling stuck or unsure if you have a good mix of signals? Try using the frameworks mentioned in "1. Where to look" and "2. What to pick out" to categorise your signals and for inspiration. Heavily filled categories might show where more attention has been given, while unfilled categories offer hints as to what might have been missed or requires more understanding.
+ Issues do not only have to be examined through the lens of signals and driving forces. Just as many futures are possible, many versions of the past and present also exist. Taking reference from the **Entangled Time Tree**, try using the idea of multiple pasts, presents, and futures to explore a topic too.

Find out more about the Entangled Time Tree under Statement 4 in **Section 1**.

Page 28

Read more about the importance of diverse perspectives in expanding field of vision and understanding in **Section 1** and **Section 3c**.

Page 8

Page 138

Scan collaboratively, not alone
Collective intelligence is valuable

+ Horizon scanning can be done alone, but creates more value when done together. If possible, have others do this with you, be it gathering signals or making sense of them.
+ Not sure what to do with something you have noticed? Talk to someone to see if they can shed new light on it. Otherwise, discard it or put it aside and revisit it some time later.

Practice, practice, practice
Developing your scanning capability over time

+ It takes time to build a base of knowledge. When you know nothing, everything sounds new. Most things are not new, you just have never heard of them.
+ Your expertise in spotting new outliers will come with time, so just keep at it. Think of it as building a mental spam filter for the future. Eventually, you will spot the signals others miss or cannot readily find, making you either invaluable at strategy meetings or insufferable at parties. Possibly both.

FROM WHAT TO SO WHAT

READ THIS IF YOU WANT TO IDENTIFY WHICH PARTS OF CHANGE ARE MEANINGFUL TO SPECIFIC PERSPECTIVES AND CONTEXTS.

This section has three components.

1. Become more aware of how thinking and meaning-making happens
2. Analyse implications of change and generating possibilities
3. Use potential futures to consider which aspects of change are meaningful

(2) and (3) are closely intertwined.

Sensemaking is about turning information we perceive into shared understanding of what change means to our circumstances.

+ Out of everything that is changing (or not), what is important to us?
+ Why is this important to us and how does it affect us?

Futures thinking helps us make sense of changing, uncertain, and/or complex situations by expanding our boundaries of analysis to discover the less obvious. This requires first diverging *widely*, so that we avoid converging on the obvious in a rush. This process is iterative and challenging because there are limited data points on emerging or fringe issues, and meaning-making is contextual and subjective.

Collaborative thinking supports divergence, assumption-checking, and the identification of bias. Bringing together different perspectives, lived experiences, and values enables people to exchange and build on one another's ideas. These discussions increase data points, allowing new patterns and possibilities to emerge. They also act as "mirrors," helping us reflect on why we hold certain interpretations and whether they still hold.

This collective learning approach—examining interactions and revisiting assumptions—can also be applied to testing the robustness of existing strategies or developing new ones.

See **Section 3d** for more on designing responses to possible futures.

Page 144

1/3 Become more aware of how thinking and meaning-making happens

Our understanding of and the meaning we ascribe to events is influenced by factors such as:

+ Who we are—our identities
+ Where we come from—our backgrounds and journeys
+ What we know about how things came to be
+ Our biases and assumptions—which if not checked, may end up surprising us
+ What we believe in—our worldviews and ideologies

Together, these factors give rise to different interpretations of the past, present, and future. These factors can also change, like when new information is unearthed, or through encounters that offer new perspectives on an issue.

To *uncover* thinking, ask:

+ What do we observe? What is obvious?
+ What enables this to happen/exist?
+ How is meaning assigned to what has been observed? What assumptions are being made?
+ What beliefs shape behaviours and decisions?

LADDER OF INFERENCE

A framework developed by Chris Argyris in 1970 and popularised by Peter Senge in his 1992 book, *The Fifth Discipline*. It describes the steps people use to make sense of situations in order to act.

CAUSAL LAYERED ANALYSIS (CLA)

A tool developed by Sohail Inayatullah that examines how issues are framed, understood, and could be transformed.

To *challenge* thinking, ask:

+ What are we looking too little at? Are we only thinking about recent events or the biggest hype?
+ What else might happen? Could things unfold differently (e.g. not linearly)?
+ Are we looking for and interpreting information to confirm what we already think?
+ Could we be under- or over-estimating the effects of the future on the present and vice versa?

The **Ladder of Inference** and **Causal Layered Analysis (CLA)** are some ways to help you uncover, challenge, and (re)construct thinking.

2/3 Analyse implications and generate possibilities

3/3 Consider meaningful aspects of change

The process of analysing implications and generating possibilities helps us appreciate what happened or could happen, identify what matters to our context, and determine if and how to act.

Consequences: What if ___ happens?
Examining direct and indirect effects reveals how change affects individuals, groups, practices, and society differently. The same event might benefit one party while harming another. Tools like the **Futures Wheel** and **Cross-Impact Matrix** enable structured brainstorming to visualise possible consequences from signals, driving forces, scenarios, and even potential actions.

Possibilities: What if something else happens instead?
While the status quo represents one possible future, various factors could produce alternative trajectories. Imagining future worlds helps with challenging thinking about the present and expectations about the future by creating safe spaces for discussing uncomfortable or taboo topics.

Making meaning from consequences and possibilities
Future worlds are built and used for different intentions:

+ Creating multiple, alternative futures to open minds and anticipate diverse possibilities
+ Constructing specific futures to pursue or avoid

You cannot achieve both objectives with a single set of scenarios simultaneously. However, exploring multiple futures first can help identify desired or undesired outcomes to focus on. Some ways to generate future worlds include **Alternative Futures**; **2x2 Scenarios**; and CLA, which transforms futures by changing underlying myths and metaphors.

Product and process are not separate, but symbiotic. Bring others along by involving them in mapping consequences or imagining futures. Use implications or scenarios as starting points to:

+ Identify connections, patterns, opportunities, challenges, and uncertainties
+ Check if other areas or perspectives should be included
+ Assess different strategies
+ Discuss priorities

FUTURES WHEEL
Helps visualise the effects of change in order.

CROSS-IMPACT MATRIX
Used to explore how different changes, trends or events interact with key elements of a system.

ALTERNATIVE FUTURES
Imagines possible pathways using four archetypes—growth, discipline, collapse, and transformation.

2X2 SCENARIOS
Combines two driving forces on a matrix to generate four different scenarios.

See **Section 3d** for more on prioritisation and stress testing, and **Section 3e** for ideas about facilitating conversations about the future.

Page 144
Page 152

FOOTHOLDS
Refer to Case Study 2 (Preposterous Futures) in **Section 2b** for an example of how scenarios can be used to prompt discussions.

Page 62

FROM SO WHAT TO NOW WHAT

READ THIS IF YOU WANT TO INFLUENCE STRATEGY MAKING AND OUTCOMES USING INSIGHTS FROM FUTURES THINKING.

This section has three components.

1. Build consensus on what to address
2. Come up with strategy options
3. Choose which strategy option(s) to implement to achieve desired outcomes.

The preceding sections help with gathering intelligence to understand what is changing in different time horizons and expanding our boundaries of analysis. Exploring different ways in which the future might unfold allows us to build shared understanding about change and think about the decisions that need to be made today about what is already happening or what we anticipate.

Prediction works when patterns hold, but foresight helps when they break. Your decision-making process should therefore consider whether current strategies still hold and use these insights to inform planning.

The steps in this section can help you move from appreciating what the future might hold, to making choices about what to do and how, in the present and beyond. Going through them are how you can translate insights to actions across multiple time horizons, and bridge foresight to strategic planning.

Every organisation has its own decision-making process and criteria. Some involve methodical discussions and carefully derived formulas, while others prefer to be locked up in a room with a timer and an inadvisable amount of caffeine. There are methods, tools, and frameworks in other fields that can be used to facilitate decision-making, so feel free to make use of these too.

1/3

Build consensus on what to address

If you have not done so already, identify the opportunities and threats that may arise regarding your chosen issue before you start on this. Be clear about whose perspective you are taking (e.g. citizens, businesses, your team, etc).

Now that you have some sense of how change affects your stakeholders and operating context, which of these are more important to act upon? Is everyone on the same page about this? With finite resources and time, how might you decide what is truly a priority (or not), and most critically, why?

First, arrange the opportunities and threats from the possible futures you have generated by some order of importance.

+ Discuss why you have arranged the points in that order. Does everyone in the group agree with the order and rationale?
+ Rearrange the points if needed, until the order makes sense to everyone.

Next, to converge, ask:

+ Which of these do we want to make happen or avoid? Why?
+ When we put these together, what does that future look like? Is it coherent?
+ Where are the critical uncertainties and how might they affect what we do now and later?
+ Therefore, what are our desired outcomes? Why did we choose these instead of other possible outcomes?

If you find yourself with a long list of decisions, pick out the ones that are first-order decisions (i.e. other decisions depend on the outcome of this first set of decisions) to work off.

Then, (re)confirm the key decisions your organisation needs to make.

+ Refer back to the Checklist you went through in Section 3a. Are these still the things you need to make choices about? Eliminate the ones that are no longer relevant.
+ Based on what you have done so far, are there new decisions that you think are now also important for the organisation to make? Add them to the list.
+ List these key decisions down. They will anchor your process from here. Distinguish between decisions that apply in one, some, or all circumstances.

Case Study 7 (Making Our Future: New Directions for Human Development in Asia and the Pacific) in **Section 2b** is an example of how macro shifts and scenarios were analysed to derive recommendations for action.

Page 84

2/3 Come up with strategy options

What are "strategy options"?
Simply put, these are the different ways you can take a certain decision. For example, a mobility start-up might have to decide on the customer profile they want to target. One option might be the mass market (i.e. public transport), and another option might be people seeking luxury transport services.

The term is pluralised because just like there are multiple ways in which the future can happen, there are also multiple choices when it comes to making a decision.

How to come up with strategy options
Some structured ways to brainstorm options include a **TOWS analysis, backcasting**, or simply listing out options in a table organised by the decision(s) to be taken.

The options you come up with should be different and mutually exclusive, including opportunities you can leverage. Note that your options do not only have to be new or require you to take immediate action - what you are already doing, or keeping an eye out for developments (such as by using an **Early Warning System**), count as options too.

Remember to use the desired outcomes and key decisions you identified in "1. Build consensus on what to address" to guide you.

Case Study 8 (Participatory Backcasting for Reconciliation) in **Section 2b** is an example of backcasting.

Page 88

A stakeholder analysis can complement strategy brainstorming. Case Study 3 (Future of the Sea) in **Section 2b** is an example of how stakeholder analysis can be done.

Page 70

TOWS ANALYSIS
Builds on a SWOT analysis to generate internal and external strategies by layering strengths and weaknesses against opportunities and threats.

BACKCASTING
Lays out key changes along a timeline from a preferred future to the present.

EARLY WARNING SYSTEM
A tool to track indicators that possible future trends or events are imminent.

3/3 Choose which strategy option(s) to implement

WIND TUNNELLING
A term borrowed from aerodynamic research, referring to a tool to test how well policies, strategies or project options stand up against a set of scenarios, trends or future events.

RED TEAMING
Emerged in the 1960s as a way of challenging strategy or project plans using an outside group, by incorporating adversarial thinking.

SENSITIVITY ANALYSIS
The study of how changes in various factors will affect a system and outcomes.

PRE-MORTEMING
Assuming that an objective, strategy, or project has already failed and seeking to identify potential causal factors.

FOOTHOLDS

Which option or combination of options is the most robust?
Stress testing is a way of identifying when your strategy options work well or not, so that you can choose the option(s) that best serves your purpose. You can do this by weighing the different options against each other or trying them out for yourself. Some forms of stress testing include **Wind Tunnelling**, **Red Teaming**, doing a **Sensitivity Analysis**, and **Pre-morteming**.

When evaluating your options, besides future possibilities, it is also useful to consider other sources of information about the past and present, such as citizens' views and programme effectiveness, which can come from research, analytics, and metrics that you already have today. Here are four questions to help you choose:

+ How does this option address the decision to be made?
+ Who does this option benefit or disadvantage? Consider your key stakeholders.
+ Why is this option better or worse than others in your context or the scenarios/trajectories you have developed?
+ What are the trade-offs involved and are you willing to bear them?

If you have multiple decisions to take, check if the individually preferred options are collectively sensible (or ridiculous). Going with one option may make another decision more challenging or impossible to implement (for example, expanding operations will make it harder to manage halving your budget).

FROM INSIGHTS TO INFORMED DECISIONS

We hope that the steps in this section will help you to gain clarity on your desired outcomes for the issue you have examined. This means knowing what is important to do (and what is less or not important!) and why. While we cannot anticipate every single future, this clarity should form the basis for choosing what you will do to achieve your desired outcomes—from the present to the short-, medium-, and long-term.

Making these choices can involve tough conversations about priorities and beliefs. Choosing what matters means choosing what does not. Remember, if everything is important, then nothing is. Some of the points mentioned in Section 3c can help with uncovering mental models, and Section 3e can help with socialising an audience to thinking about the future and talking about it.

The next step is to put your decisions into action by planning *how* you intend to achieve your outcomes and obtaining support and resources. Planning will vary in different settings, depending on your *objectives* and *rationales*. For some, this might take the form of proposing a project that gets incorporated into your organisation's upcoming work plans; while for others, planning could produce a five-year roadmap document for an entire organisation or industry. Just make sure there is formal commitment to act upon your intentions.

Last but not least, remember that plans are useful only when relevant to your context. The world will continue to happen after you have made your plans, so be mindful that things can and will need to change as you go along. Revisit your strategies from time to time to take into account new signals and developments in your operating environment, and consider if plans need to adapt when goals and ways of doing things change. Make sure you have milestones to track progress, and use suitable platforms to review and adjust your tactics regularly.

You got this. We believe in you!

Some tips on reviewing project progress can be found in **Section 3a**.

Page 126

INSPIRE OTHERS TO THINK ABOUT THE FUTURE

READ THIS IF YOU WANT
TO INCITE WITH INSIGHTS.

Engagements can be for different purposes, and can be done at any point in your process. This section organises our offerings into two clusters:

1. What engagements can be for
2. What engagements can look like

Product and process are not separate, but symbiotic. While engagements come in many forms and serve many purposes in one's process, they must ultimately be *intentional*, *inclusive*, and *impactful*.

Good discussions and gatherings do not happen by magic, nor are their benefits—while often strongly felt—easy to capture in words or metrics. They are scaffolded by the hidden work that makes conversations flow, such as the undervalued soft skills in facilitation and session design. They make use of, and in turn enhance, insights found in products.

Engagement is both purpose and practice. It matters why we bring people together, and how we shape the experience once they arrive.

1/2 What can engagements be for?

Engagements can bring many kinds of change. Two ways to help clarify the form of interaction you really want are:

+ The **IAP2 Spectrum of Public Participation**—do you want to inform, consult, collaborate, or something else?
+ The **Nine Dimensions** framework—do you want to shift meanings (around an issue), connections (between people), or power (who gets what say), or others?

Some things to bear in mind about what engagements can achieve include:

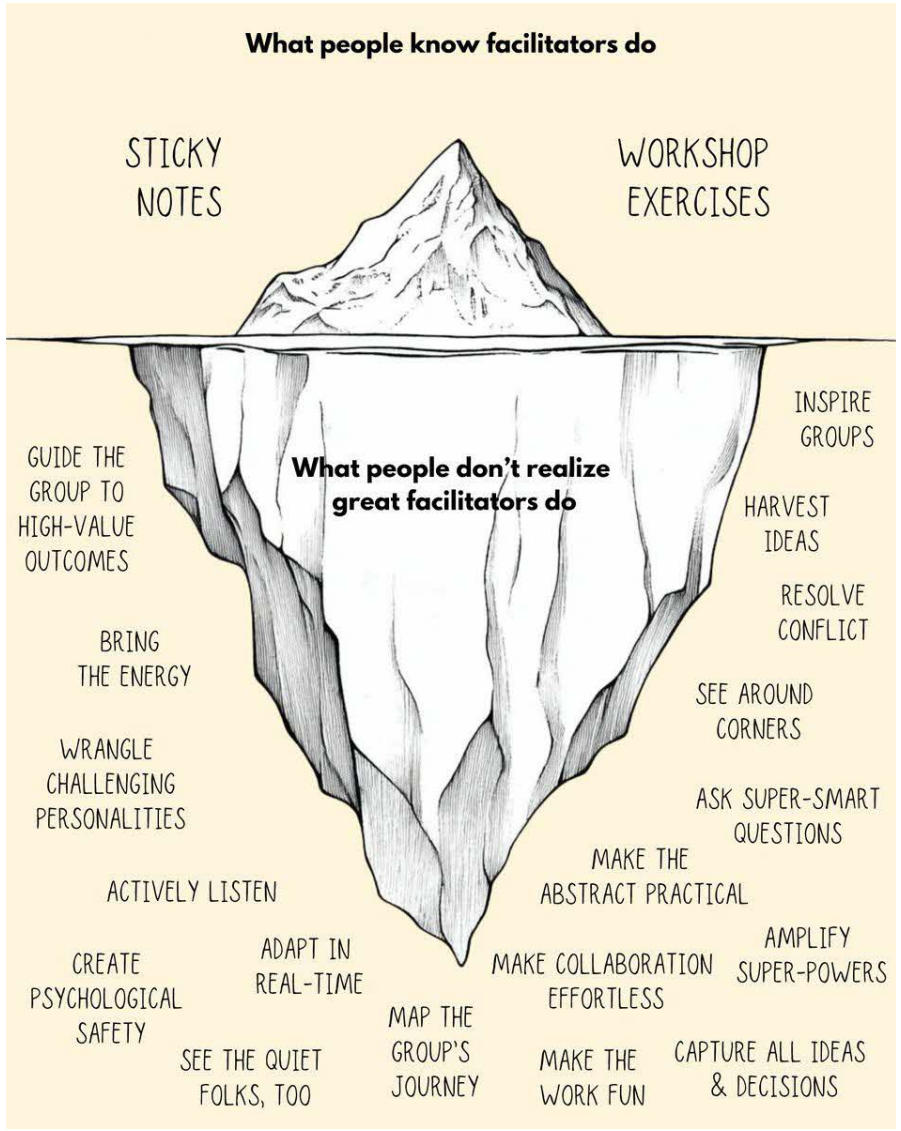
+ Different objectives can co-exist in one project—you may be consulting in one phase and co-creating in another.
+ Be explicit early—any misunderstandings come from assuming "engagement" means the same thing to everyone.
+ Not all change is rational or linear—do not discount emotional, embodied, symbolic, or linguistic shifts.

Use the Five Statements in **Section 1** and the overview of objectives and processes at the start of **Section 3** to introduce futures thinking or persuade an audience to use it.

Page 8
Page 112

IAP2 SPECTRUM OF PUBLIC PARTICIPATION
Describes what engagement might mean depending on who is involved and why.

NINE DIMENSIONS
A tool by the CreaTures project which helps surface nine kinds of change foresight can create based on meanings, connections, and power.



ABOVE An iceberg diagram created by consultant Tim Leake in 2025, presenting overlooked but essential skills and actions for effective facilitation outcomes.

2/2

What can engagements look like?

Once the intent is clearer, the question becomes—what shape might the engagement take?

Conversation starters can be a low-barrier way to warm up a room, humanise participants, and shift energy into a more open, playful mode before beginning other activities.

Use simple questions like "If you met yourself from 10 years ago, what would surprise them about today?" or "What are you most curious about regarding the future of ___?" to reposition perspectives or turn conversations towards the future.

Everyone holds implicit assumptions coming into an engagement, and the **Polak Game** is one way to make those implicit assumptions explicit. The activity asks participants whether they see the future as better or worse than the present, and whether they feel they have agency in shaping it. By physically positioning themselves along a line, participants externalise their internal views, making their orientations visible both to themselves and to others for discussion.

Use brainstorming prompts to keep conversations active and creative, suggesting other paths for discussions to unfold. **Seven Questions** is one example. Of the questions, some are realist and confront the world as it is, while others are fantastical and imagine how else the world could be.

Beyond standard meetings and roundtables, there is also a wide range of gathering formats. The **Delphi Method**, **Fishbowl Discussion**, **Open Space Technology**, and **1-2-4-All** are adaptive methods that illustrate how structure and spontaneity can be balanced to fit the dynamics and interests of attendees.

Case Study 11 (Foresight Conference 2024) in **Section 2b** is an example of an engagement with unstructured design for open dialogue and participant autonomy.

Page 100

POLAK GAME
A workshop exercise developed by Peter Hayward and Stuart Candy, who were inspired by the work of Frederik L. Polak.

SEVEN QUESTIONS
First developed by Shell's scenario planning team, the method seeks to help people explore alternative futures, uncertainties, and key drivers of change using seven prompts.

DELPHI METHOD
A way of crowd-sourcing inputs on an issue across multiple rounds. A group responds anonymously to questions, receives aggregated feedback, then revises their views until consensus emerges.

FISHBOWL DISCUSSION
A structured format where a small inner circle discusses a topic while a larger audience listens, and people can rotate into the discussion at set points.

OPEN SPACE TECHNOLOGY
An unconference-style format where participants create their own discussion agenda in real time.

1-2-4-ALL
An inclusive and scalable way of generating ideas. Participants reflect alone, then discuss in pairs and synthesise in fours, before sharing insights with the entire group.

TIPS ON DESIGNING ENGAGEMENTS

Process x Profile of audience
The same future world or insight will land very differently depending on who receives and uses it. What content and forms of interaction are your audience likely to respond well to?

Consider:
+ Familiarity with futures thinking—accessible or experimental and abstract formats?
+ Cultural and professional norms—formal or informal, serious or playful?
+ Time and attention span—condensed, bite-sized or long-form, deep dive formats?
+ Content type—do numbers, language, or images resonate more deeply with them?
+ Preferred modalities of engagement—do they like to read, see, play, discuss, touch or experience?

Process x Purpose of engagement
+ Create a conducive space for people to relate to each other—who speaks first and who feels seen matter. Even simple ice-breakers can change power dynamics.
+ Build in some time for movement or embodied exercises—they help break hierarchy and get people out of their heads.
+ Document lightly—too much note-taking can kill the flow, so strike a balance.
+ Place devices thoughtfully—must there be a phone or laptop on the table? Having a device between you and your conversation partner alters dynamics.
+ Use different senses—put up pictures, play sounds, or even bring objects that people can touch to help them engage with the topic being discussed in different ways.

Product x Purpose of engagement
Some engagements may make use of products to communicate insights and spark conversation. These can take any form: a thinkpiece, a fictional newspaper cover story, a play, or even a poem written in Singlish.

The medium shapes how people engage with the future world or insight you are presenting, and different formats are better suited for different purposes. For example:
+ Explaining or sensemaking—reports or infographics work well to synthesise trends and provide structure for analytical audiences.
+ Inspiring and sparking imagination—use evocative media like artefacts, personas or speculative art to make the future feel alive and emotionally resonant.
+ Provoking debate or challenging assumptions—formats like headlines from the future, fictional speeches or manifestos can disrupt current mindsets and invite critical reflection.
+ Influencing strategic planning and policy—policy briefs, maps, videos, detailed presentations or mixed formats (such as scenarios combined with artefacts) can link imaginative futures to actionable pathways.

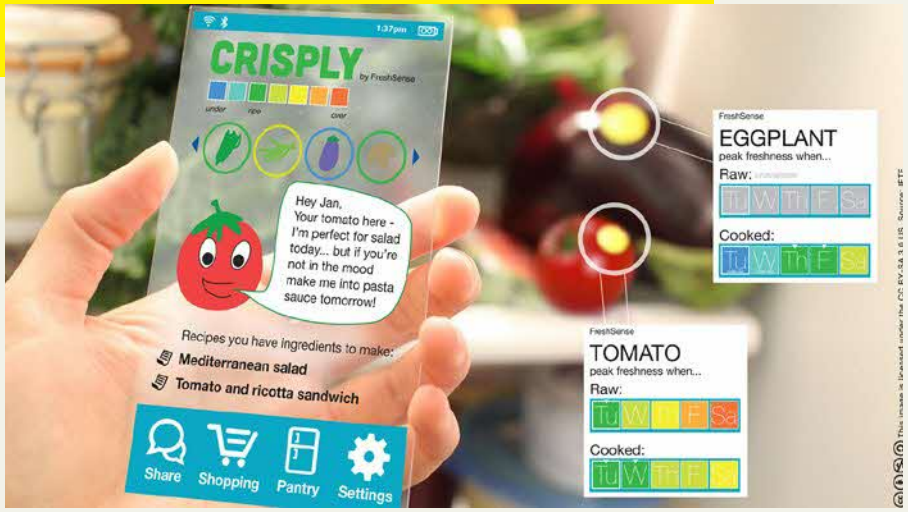
Case Study 4 (IPS Prism) in **Section 2b** is an example of a multi-modal foresight project that included public engagement.

Page 72

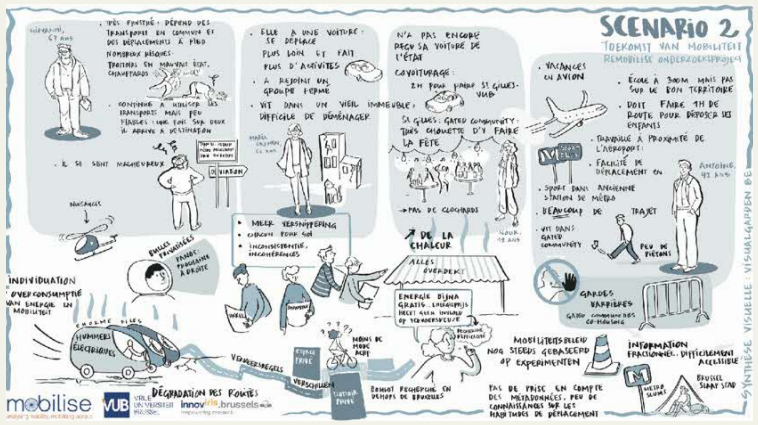
Case Study 9 (Future Design in Yahaba Town) in **Section 2b** is an example of how an immersive experience was created for workshop participants.

Page 92

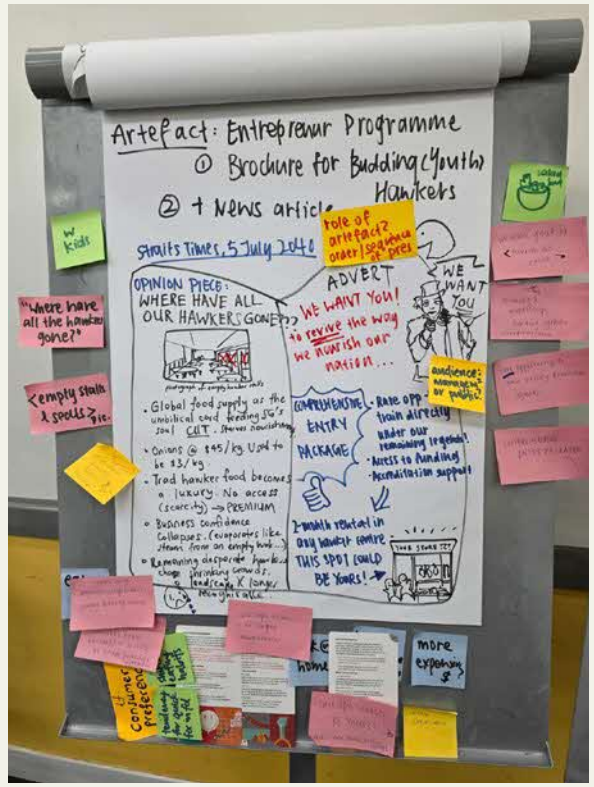
THERE ARE MANY DIFFERENT WAYS IN WHICH YOU CAN DEPICT FUTURE WORLDS AND INSIGHTS.



ABOVE Image for the Institute for the Future's 2024 Design Futures training session marketing materials, depicting a gadget capable of identifying food items, providing cooking suggestions, and cataloguing one's produce inventory.



ABOVE Results from a personas workshop on the future of urban mobility in Brussels by 2050, conducted as part of the Remobilise (Resilient Mobility Strategies for Uncertain Futures in Brussels) research project.



LEFT A newspaper headline about an entrepreneur programme for hawkers in Singapore in 2040, from a workshop run by the CSF in September 2025.

RIGHT 2x2 scenario matrix from a workshop run by the CSF in September 2025.

Each axis represents a key variable or driver (such as variations in supply chains and businesses' behaviours), and the quadrants formed present distinct possible futures based on combinations of those variables.

AI AND FORESIGHT

AI now features in almost every conversation about the future. It raises hopes, concerns, expectations, and fears—often at once. It feels natural to ask: what does AI mean for foresight? Should foresight practitioners use it?

AI increasingly shapes how information is produced, retrieved, and circulated. Like electricity and the internet, which came as disruptions and then became infrastructure, AI is already woven into our tools, systems, and environments. Whether we know it or not, much of what we encounter is touched by AI.

Given this, the question is not *if* we use AI (we do, consciously or not), but *how* we use it and *what for*.

The answer to "what for" cannot be "everything"—not because AI will never do more, but because usefulness depends on purpose, context, and judgement. Just as there is no single right way to do foresight, there is no single right way to use AI. Match the tool to the purpose.

Here are some ways AI can reliably be used in foresight, regardless of how its capabilities evolve:

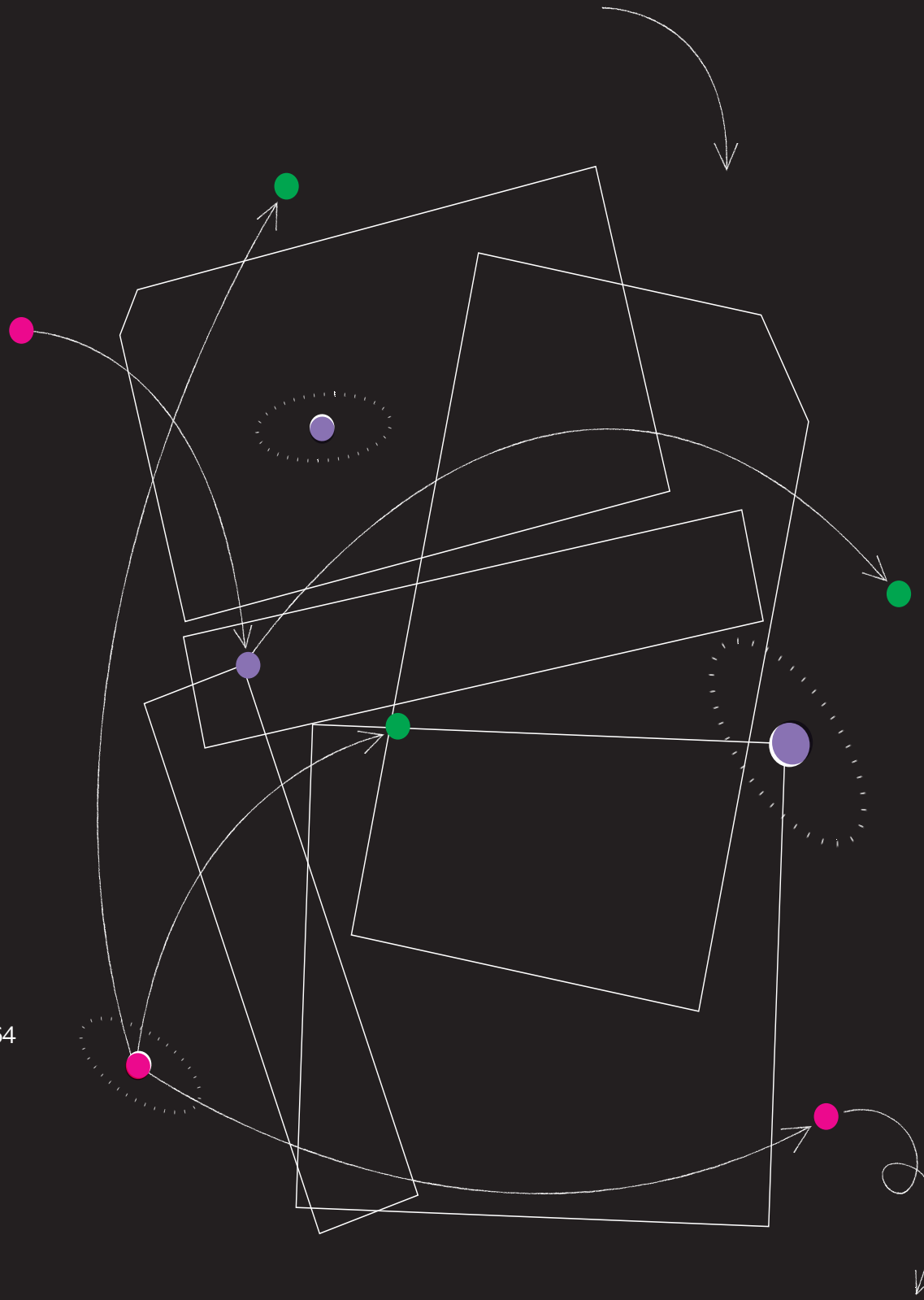
+ To summarise—AI can offer quick overviews or highlight starting points for deeper reading.
+ To teach—maybe you want to understand the basics of something you have always struggled with. Prompt a model to customise an explanation for you.
+ To challenge—rather than a shortcut, consider how AI can push you meaningfully. Ask for a breadth of perspectives; perhaps across the full spectrum of STEEPLE? Have it emulate thinkers you want to learn from or spar with. Prompt it to identify weaknesses in your argument, so you can outrun your own average and not regress to a mean.
+ To be productively strange—AI's representations of the world sometimes differ from our own. Use it to unsettle assumptions or explore unfamiliar possibilities.

Just as AI can assist you, it can also erode your capabilities if used without awareness. Maintain your own skills in thinking, judgement, and meaning-making, because AI cannot supply your values, aims, or priorities. Before deciding what AI should augment, it helps to understand foresight practices themselves—such as scanning, interpreting, questioning, and synthesising across sources.

AI can support sensemaking in powerful ways, but it cannot replace the human stakes through which organisations decide what matters. That is not to say that AI can never construct a value system. It is simply to say that AI is not you.

Finally, treat AI as an object of foresight in its own right. Everything written here may soon be dated. AI is a fast-moving source of social, economic, and cultural change, generating new behaviours, risks, and possibilities.

So, observe closely.



Afterword

Foresight is not a finished discipline, nor is this handbook the final word. Like every foresight exercise it describes, this book is a snapshot in time, a record of what we have learned so far. The concepts, tools, stories, and examples here are reminders that foresight grows through practices of noticing change, questioning assumptions, working and communicating with others in many forms, and revisiting our understanding as the world shifts.

This handbook was shaped by many hands. We thank the colleagues who contributed ideas, edits, provocations, and patience throughout its development; the many officers across the Singapore Government who participated in workshops, experiments, and conversations that sharpened our understanding; and the generations of CSF officers and interns whose curiosity refined our idea of what foresight in the Singapore Public Service can look like.

We are also indebted to the wider community of futurists, researchers, designers, and practitioners—in Singapore and abroad—whose projects, writing, methods, and reflections informed much of what is presented here. Their work continues to broaden what foresight thinking can be, and remind us of how far our ambition can stretch.

Most of all, we hope this handbook supports you in making sense of change and in helping others do the same. Whether you use it to run a workshop, design a project, facilitate a conversation, or simply think differently about the future, we hope it serves as a steady companion. Foresight work is never done, but it becomes easier, richer, and more meaningful when practised together.

GLOSSARY

Backcasting
A planning method that starts by defining a desired future state and then works backwards to determine the steps, decisions, and conditions required to reach it. For more, see page 88.

Causal Layered Analysis (CLA)
A method examining issues across four layers—litany, systems, worldviews, and myths—to uncover underlying assumptions and reframe how problems and futures are understood. For more, see page 97.

Complex Systems
Systems made of many interacting parts whose behaviour is emergent, unpredictable, and nonlinear. Small changes can lead to large, cascading effects across the system. For more, see page 13.

Cross-Impact Matrix
A technique for analysing how different drivers, trends, or events influence each other, helping identify reinforcing or contradictory relationships that shape futures. For more, see page 142.

Drivers / Driving Forces
Underlying forces—technological, social, environmental, economic, or political—that shape change over time and influence the direction and nature of possible futures. For more, see page 134.

Entangled Time Tree
A visual framework illustrating how pasts, presents, and futures are intertwined, showing that time is nonlinear and shaped by multiple histories and interpretations. For more, see page 28.

Foresight
A structured approach to exploring change and uncertainty. It improves decisions today by examining multiple futures, challenging assumptions, and expanding what organisations notice and prepare for. For more, see page 7.

Futures
The idea that many different outcomes are possible. Futures thinking examines plausible, probable, possible, and surprising alternatives rather than assuming a single future. For more, see page 7.

Futures Cone
A diagram showing how types of futures—projected, probable, plausible, possible, and preposterous—expand over time. Helps clarify the range of change that might unfold. For more, see page 27.

Futures Wheel
A tool that maps first-, second-, and third-order consequences of a change to reveal ripple effects across systems and domains. For more, see page 142.

Habits of Mind
A set of dispositions—such as metacognition, flexibility, empathy, and persistence—that help individuals work well with uncertainty, reflect deeply, and think creatively. For more, see page 21.

Horizon Scanning
A systematic method for detecting early signs of change by identifying weak signals, emerging issues, and disruptions across multiple domains. For more, see page 131.

Meaning-Making
Interpreting signals, patterns, and changes to understand what they might mean for an organisation's context, decisions, or strategy. For more, see page 138.

Nonlinearity
A property of complex systems where small changes can cause disproportionately large effects. Nonlinear relationships make outcomes difficult to predict and often lead to sudden shifts or cascades. For more, see page 20.

Outliers
Unusual, rare, or extreme events or behaviours that fall outside expected patterns. Examining situations at the edges can reveal blind spots, stress-test assumptions, and highlight signals of emerging change. For more, see page 30.

Risk versus Uncertainty
Risk involves known probabilities; uncertainty involves unknown or unknowable outcomes. Foresight focuses on uncertainty, where prediction is limited and multiple futures must be considered. For more, see page 16.

Scenarios
Structured narratives or models that explore different possible futures. Scenarios help organisations test assumptions, consider implications, and make robust decisions. For more, see page 142.

STEEPLE
A scanning framework covering Social, Technological, Economic, Environmental, Political, Legal, and Ethical domains. It structures and broadens attention beyond a single sector. For more, see page 131.

Stress Testing
Stress testing pits strategies against each other and in different scenarios to reveal their strengths and weaknesses, so the most robust option for one's objective and circumstances can be selected. For more, see page 149.

Systems Thinking
An approach that views issues as interconnected parts of a whole. It emphasises relationships, feedback loops, and patterns of behaviour rather than isolated events or linear cause-effect chains. For more, see page 13.

Three Horizons
A framework showing how change unfolds across three timeframes: Horizon 1 (dominant but declining), Horizon 2 (emergent innovations), and Horizon 3 (long-term transformative futures). For more, see page 133.

Weak Signals
Early, ambiguous signs of change that may become significant over time. They help organisations anticipate disruptions and emerging possibilities before they become obvious. For more, see page 131.

FURTHER READING

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SECTION 2B: CASE STUDIES

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IMAGE ATTRIBUTIONS

Entangled Time Tree
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