

# Conversations for the future

Vol.3

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# FOREWORD

## COMPLEXITY IS THE ENEMY OF FORESIGHT

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Foresight traces its roots in the Singapore government to the implementation of scenario planning in the Ministry of Defence in the 1980s. Elevated to whole-of-government in 1995 with the establishment of the Scenario Planning Office (later called the Strategic Policy Office) in the Prime Minister's Office, the first national scenarios were drafted in 1997. The provenance of foresight is therefore more than three decades old. Over time, and especially through the national scenario planning effort, the processes of foresight and futures thinking are very much embedded in government planning and policy-making. The vocabulary of foresight is now spoken and understood by two generations of civil servants throughout the Public Service. Today, it is part of the folklore of the Singapore government.

Singapore is probably the only government in the world which has deployed foresight as a systematic practice. Our experience is that foresight better informs policies, plans, and even budgets. It has helped to create a culture in government that questions assumptions and embraces a systematic and strategic approach to planning for the future. It makes civil servants aware of uncertainties, challenges as well as opportunities, in a future that is essentially unknowable.

Yet despite these enormous intangible benefits, foresight is still not embraced as a mainstream process. There are good arguments why this should remain so. Moreover, many continue to equate foresight with prediction. This misapprehension is a common fallacy, even among those with direct experience of foresight processes like scenario planning. The fallacy can lead to a logical conclusion that the reward of foresight is only reaped when predictions come true. Of course, accurate predictions are seldom achieved in reality. But then a loss of faith in the utility of foresight could ensue, leading to resources removed or reallocated away from this activity, an easy step when foresight is not mainstream.

The complexity of the world that we live in is a major reason why foresight cannot produce accurate predictions. Complexity arises because “everything is connected to everything else”, an aphorism often attributed to Lenin, with Leonardo da Vinci making much the same observation a few centuries earlier. This interconnectedness produces the distinctive property of emergence that characterises all complex systems. Emergence is the phenomenon in which the collective behaviour of a complex system is created by the interactions of its abundant components, or agents, which is a term used in complexity science.

Imagine the thousands of ants – the agents – building a colony. Through its diet, each ant has been allocated a simple and pre-determined function. It could be a worker ant, or a soldier ant, or even the queen ant. But the complex colony, including features like the tunnel networks and food storage, emerges from the interactions of these individual ants, and cannot be predicted from merely looking at the functions of each ant. Instead, the colony is the aggregate of the behaviours of the thousands of ants that make up a colony. The behaviour of the colony is emergent.

Similarly, in complex human systems like countries, cities, traffic, or ecosystems, outcomes are the result of interactions between countless agents, who are the people who make up such systems. Small changes or interactions between the thousands if not millions of agents in the system can lead to large-scale effects or outcomes that surprise. This is because it is the collective behaviour of the entire complex system that produces the outcomes, rather than the actions of the individual agents. In complex systems, the property of emergence means that we only know what is going to happen when it happens.

*Reductionism*<sup>1</sup>, which was the basis for the Scientific Revolution, relies on the assumption that what is complex can be reduced to simpler subsets that are easier to evaluate, and that when re-aggregated, will produce results that approximate the real world. This assumption informs much of the methodology of modern natural science, and even extends to government, where the tendency is to divide big problems into smaller pieces.

This is a major reason why governments are organised into ministries and agencies. This structure enables governments to deal with its challenges in manageable chunks, like health, defence, trade, education, and finance. It works well, up to a point. But its value diminishes as problems become larger and more wicked<sup>2</sup>. These include massive crises such as the Covid-19 pandemic, and existential challenges like climate change and demographics. At this stage, it becomes necessary to look at such problems more holistically, bringing ministries and agencies together in what we call a *whole-of-government* approach. Whole-of-government is not going to replace the traditional organisation of government into ministries and agencies, but its salience is growing as a direct consequence of the increasing complexity of our operating environment.

Yaneer Bar-Yam, an American scientist and founder of the New England Complex Systems Institute, has emphasised the importance of correctly matching an organisation’s complexity to its environment. In the fight against transnational terrorism in Singapore, this principle has been encoded in the axiom that “it takes a network to fight a network”. In other words, if the operating environment is complex, as it invariably is, then a government’s

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<sup>1</sup> *Reductionism* is described as an intellectual and philosophical view that interprets a complex system as the sum of its parts.

<sup>2</sup> A *wicked problem* is a problem that is difficult to solve because of incomplete, contradictory, and changing requirements, in which a scientific-reductionist approach cannot be applied because of the lack of a clear problem definition and differing perspectives of stakeholders.

organisation and processes should reflect this complexity. This is why, given the complexity of our world, interdisciplinary collaboration through whole-of-government is essential for solving the big challenges of today. The argument also extends to government in general. It is not possible, for example, to separate the conduct of foreign policy from other large national interests like the economy and defence. So, there has to be a lot of internal coordination, and sharing of information.

The whole-of-government approach is an important response to managing complexity and dealing with wicked problems. The natural – but often inappropriate – reductionist approach would be to break down a wicked problem into smaller parts, and then leave it to each ministry or agency to make its own, decentralised, and bounded decisions.

In contrast, an organisation that breaks down vertical silos encourages the spontaneous horizontal flow of information that will enlarge and enrich the worldview of all of its component agencies. This in turn improves the chances that connections otherwise hidden by complexity, as well as emergent challenges and opportunities, are discovered early.

The importance of this more holistic, whole-of-government approach is growing because of the changes that are taking place today. Referring to the changes brought about by the Fourth Industrial Revolution<sup>3</sup>, Klaus Schwab, the founder of the World

Economic Forum wrote, “When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.”<sup>4</sup>

The economist, Adam Tooze, in an influential piece in the *Financial Times*, introduced us to the world of the polycrisis when he wrote, “the shocks are disparate, but they interact so that the whole is even more overwhelming than the sum of the parts.”<sup>5</sup> In a similar vein, former Senior Minister Tharman Shanmugaratnam argued that “We face instead a confluence of lasting structural insecurities – geopolitical, economic, and existential – each reinforcing the other. We have entered a perfect long storm.”<sup>6</sup>

The outcomes of the changes brought about by the Fourth Industrial Revolution, and the structural shocks of the polycrisis and the perfect long storm cannot be fully predicted or understood by leaving it to individual ministries or agencies to study their part of the problem. Emergence tells us that complex systems are more than the sum of their parts, so just studying parts of the problem will not be sufficient. Therefore, the whole-of-government approach, which looks at big challenges in a more comprehensive way, is an essential adjunct to tackling complex and wicked problems at the component level by individual ministries and agencies.

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<sup>3</sup> The *Fourth Industrial Revolution*, 4IR, or Industry 4.0, conceptualises rapid change to technology, industries, and societal patterns and processes in the 21<sup>st</sup> century due to increasing interconnectivity and smart automation.

<sup>4</sup> Klaus Schwab, *The Fourth Industrial Revolution*, *Currency*, 2017

<sup>5</sup> Adam Tooze, Welcome to the world of the polycrisis, *Financial Times*, 29 October 2022

<sup>6</sup> Tharman Shanmugaratnam, Confronting a Perfect Long Storm, *IMF Finance & Development Journal*, June 2022

Foresight methods have a role to play in helping governments cope with complex environments. A lot of the work in foresight and futures thinking beyond scenario planning is in looking for weak signals and identifying emerging trends. But it is extremely challenging to predict emergent outcomes. We are always going to be surprised because our world and our operating environment is complex. Some of these surprises will be black swans or the left-field unknown unknowns.

"Superforecasting: The Art and Science of Prediction" by Philip Tetlock and Dan Gardner explores how collective intelligence can be harnessed for better foresight. Among other things, the book highlights that superior forecasting is a skill that can be cultivated through openness to feedback, and importantly, by embracing diverse perspectives. It is arguably counter-reductionist, counter-groupthink, and a holistic approach.

Indeed, this is reflected in the foresight practices employed in the Singapore government, which eschew a focus on deep expertise, and instead complements it with a deliberate search for different views. No perspective is rejected because it is not mainstream, no possibility is ruled out because it makes us feel uncomfortable. Scenario planning, in particular, acknowledges that insights into the future are not the province of individuals, but require the contributions of many, with many backgrounds, experiences, and expertise. That is why the government has also experimented with methods for large-scale participatory foresight, even engaging the public in crafting normative futures.

In a similar vein, James Surowiecki, who incidentally took part in the International Risk Assessment and Horizon Scanning Symposium held in Singapore in 2007, explores in his best-selling book "The Wisdom of Crowds" the idea that under the right

circumstances, groups of diverse individuals can together make more accurate predictions and decisions than even the smartest individuals within the group. He argues that collective intelligence, which is achieved when there is diversity of opinion among individuals in the group, and if there is an effective mechanism to aggregate individual judgments, can be more effective in creating foresight than experts.

Leaders of companies, and leaders of countries, often have to make big decisions, and to develop long-term strategies and plans, without all the information they need, and without certainty that the desired outcomes will be achieved. It is not possible to prepare exhaustively for every conceivable contingency. Instead, foresight and futures thinking are an important way of dealing with such uncertainty. Foresight helps make people aware of the ambiguities, the challenges as well as the opportunities, in a future that is essentially unknowable. It awakens the imagination. It is almost an article of faith today that the long-term future of the country depends on the quality of its strategic plans and policies, and the ability to cope with uncertainty, change and complexity. Even if it does not predict the future, foresight is an important part of the foundation for the Singapore government's systematic approach to strategic planning.

Sun Tzu, the ancient Chinese military general and philosopher, famously wrote in his treatise, *The Art of War*, "Know your enemy, know yourself, in a hundred battles you will never be in peril." The enemy of foresight is complexity. Developing an understanding of why complexity leads to surprise, and of why it is important to have some humility that we can never really know the future, will help us do foresight better, by embracing a more holistic, whole-of-government, and inclusive approach to sharing insights and information.



FIG 1.1 ROOTED IN COMPLEXITY



# THE FOREST GROWS

AN OVERVIEW OF  
DEVELOPMENTS IN THE  
FORESIGHT ECOSYSTEM

"For a small, open and globalised country, planning for the future is a vital skillset. The government must have the curiosity and bandwidth to assess what lies ahead and how future changes will affect Singapore. Long-term thinking, complemented by the agility to adjust strategy and policies to meet future challenges and seize new opportunities, has long been in our DNA."

Prime Minister Lee Hsien Loong

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It is certainly no secret that for the Singapore government, the ability to look ahead and to make sense of a changing environment has been critical for and at the heart of its approach to governance. But how the government has thought about such capabilities, where they have been embedded in government, what the government has

valued about this capability, and how foresight has been connected with decision-making have all changed over time. As Singapore's external environment has transformed, and as the government's capabilities have developed and organisational structures have changed, how we approach the question of the future has similarly evolved.





FIG 2.1 GARDEN OF DIVERSITY



## BUILDING A FORESIGHT ECOSYSTEM

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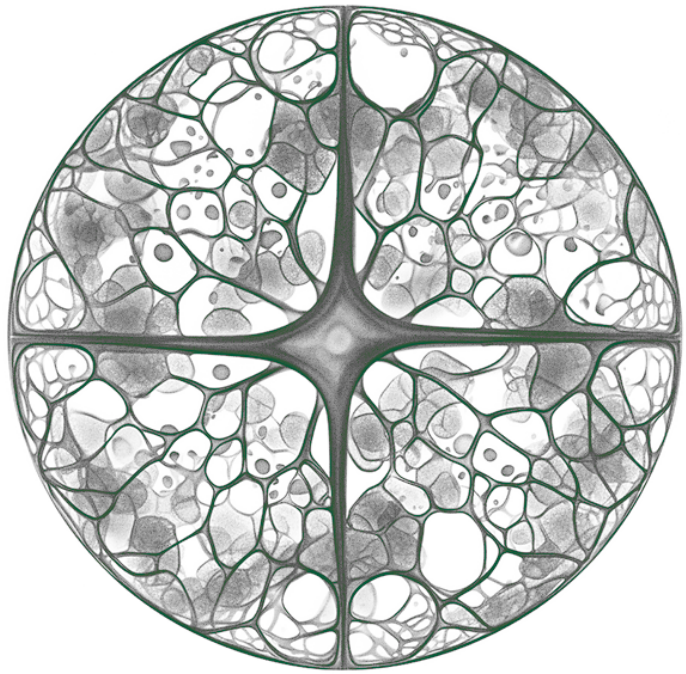
The foresight ecosystem began with a small team in the centre of government in the mid-1990s. Almost three decades later, the futurist network within the Singapore government has expanded to include a growing number of foresight units sitting alongside policy counterparts in various ministries and statutory boards. Some are more specialised teams, such as the Centre for Liveable Cities (CLC), which aspires to be a futures centre for the infrastructure and environment sector. Even in a sector accustomed to thinking and planning long-term, a futures centre like the CLC has a role to play, in part to stretch thinking on possible implications for land use arising from emerging trends around work, leisure and travel needs, and to encourage flexibility and nimbleness in executing land use and infrastructure plans. Such specialised teams present new opportunities to deepen expertise in applying foresight within particular sectors or domains of work in future. The foresight team from Singapore's communications ministry has provided their take via a "cheat sheet" at page 14. Other teams comprise part-time officers who have other related duties in developing strategy (particularly in emerging areas) or in planning functions for their organisations.

The Centre for Strategic Futures (CSF) continues to support this expansion in scope and growth in skills through deep commitment to capability development. The team spends much of its energy building toolkits and other shared resources so that agency teams can more easily implement foresight work (of many stripes) in their respective organisations, and conducting train-the-trainer sessions and acting as

in-house consultants for teams to figure out how to best use these approaches on live projects with real connection to policy shifts in their organisations. In the process, the Centre has continued to adapt and evolve its approach to how foresight is communicated to, and used to engage with, others within the Public Service and beyond. Our FutureCraft series, conducted in partnership with the Civil Service College (CSC), continues to be in great demand, with a wide audience of public servants ranging from futures practitioners to policy officers, teachers, and the military. The disruption caused by the COVID-19 pandemic only spurred the Centre's capability development team to rethink how these courses could be delivered, resulted in a transition to a flipped classroom model. This allows the time spent together in-person to be fruitfully devoted to in-depth sharing and discussion of insights, and exchanging practical tips and tricks for practicing foresight in a government context.

The Centre also acts as a central node in this evolving network, enriching the system through information sharing and cross-pollination of ideas and approaches. In recognition of the value of foresight work to the business of government, the CSF has regularly been invited to engage with the next generation of public service leaders through the various leadership development programmes the Civil Service College curates. Over the years, the two foresight communities the Centre shepherds, the Sandbox platform for practitioners to experiment in, and the Strategic Futures Network, which brings together our senior leadership in conversation around foresight-related issues, have also grown in strength and complexity.

FIG 2.2 TRANSFORMATION



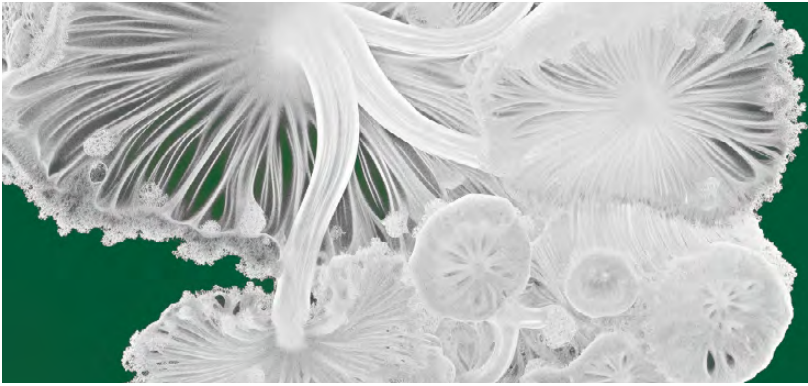
## EVOLUTIONARY PRESSURES

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Even before the enormous shock that the COVID-19 pandemic provided to the system, demand for foresight products and more significantly for foresight skills had already noticeably risen within both private and public sectors, seemingly across the board. Perhaps organisations, including public institutions, had already started to respond to a growing sense that major changes and disruptions lay ahead for the world. By the mid-2010s, the most significant geostrategic shifts since the fall of the Berlin Wall in 1991 heralded the end of a bipolar era were beginning to make themselves felt. New domains for collaboration and cooperation (such as cyberspace, outer space, the polar regions, deep seas) emerged, presenting opportunity and risk to nations and corporations alike. The nature and distribution of power and influence had begun to shift, with powers that used to be in the purview of states, such as a monopoly on the legitimate use of force, or provision of some public goods, beginning to appear in the hands of non-government actors. Emerging advancements in various fields – such as generative Artificial Intelligence

(AI), quantum computing, renewable energy, and mRNA vaccines – now suggest the possibility of near-complete transformations of economies and labour forces. These same forces present global commons challenges which threaten to upend political structures and social compacts.

As the writing on the wall became plainer to see, organisations scrambled to figure out how to react to these developments. Leaders and decision-makers realised that past experience was of only limited value in helping to navigate a novel environment, one that appears to be more interconnected, fragile, and prone to discontinuous shock than ever before. In response, the biggest consulting firms have developed the capacity to provide foresight advice, and smaller firms focused on specialised foresight, strategy, and risk management functions have mushroomed. The Centre has increasingly been engaged in conversation with a wide range of organisations on the question of how best to institutionalise foresight, and connect the insights arising from foresight processes with strategy formulation and decision-making.



**FIG 2.3**  
**EXPERIMENTATION**

## AN ONGOING EXPERIMENT

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Within the Singapore government, efforts have also been made to structure itself and organise its work to more effectively address the challenges of a 21<sup>st</sup> century environment, meet the needs of an increasingly multi-textured society, and capitalise on emerging opportunities presented by disruption and technological change. When Volume 2 of this series left off, the Centre had recently been embedded in the newly-formed Strategy Group in the Prime Minister's Office, or PMO-SG. Set up in recognition that emerging issues government had to tackle were increasingly complex, cross-cutting, and lacking single policy-owners, PMO-SG had a mandate to set the ambition for and coordinate policy efforts on a range of issues across various government departments, as well as carry out medium-term strategic planning for the whole government. How it was meant to do that, and how the foresight work of the Centre fit in, was less than clear when the move happened in 2015. Today, after eight years of experimenting and working together, the picture is clearer. The Centre's foresight work has become more integrated in the whole-of-government strategic planning process that PMO-SG collectively stewards. Regular national-level scenario exercises and horizon scanning work help the government maintain the discipline of examining assumptions, applying new perspectives and ensuring that the long-term context is considered when

developing medium-term priorities and plans. The Centre also benefits from constant access to strategy development teams within PMO-SG, which provide a natural first stop for testing new concepts and products before they are rolled out to the wider public service. Partnering other PMO-SG teams also makes the CSF's longer-term work more accessible and easier for the broader policy community to use as they develop action plans for the near-term in their respective domains. Foresight processes and approaches have also shaped thinking across the government. Regular engagements with the policy community provide opportunities for them to revisit fundamental assumptions, take a holistic view of interconnected issues, and pay attention to areas in which governments have perhaps traditionally lacked strong levers for influencing outcomes. The Centre's efforts thus support PMO-SG's efforts to build a shared sense of ambition, drive, alignment and provide a call to action to teams across the Singapore public service. This was most apparent during the Covid-19 pandemic. While Covid-19 was unprecedented, the system and processes we had in place ensured that even while putting out the fires of the slow-burning crisis, the government was able to keep our focus on the future as we pivoted our medium-term policy agenda to respond to the opportunities and challenges of the pandemic.



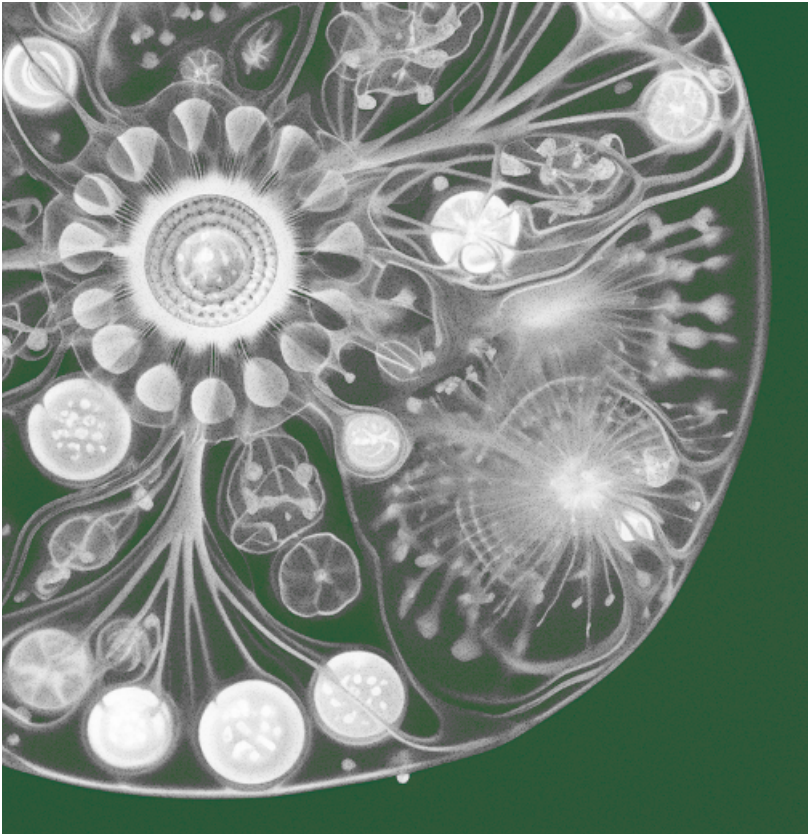


FIG 2.4  
A MALLABLE MANDALA

## LEARNING HOW TO LEARN

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As the Centre and the foresight ecosystem have co-evolved in response to evolutionary pressures and a changing Public Service landscape, it has begged the question of what skills and competencies the foresight ecosystem at large and the Centre in particular needed to develop and maintain, in order to remain fit for purpose even as our roles have changed. This has also come at a time when the broader public service itself has been moving toward competency-driven growth, to support greater agility, resilience, and performance. Officers' pathways and prospects within the public service will be more closely tied to a common set of desired behaviours and attributes described within a

framework coordinated by the Public Service Division. The foresight ecosystem faces two simultaneous challenges in answering this question: first, identifying what the public service needs in order to remain relevant in a fast-changing environment; and second, what futurists themselves need in order to be able to perform the first function competently. In resolving this question, the Centre has benefited from the wisdom and expertise contained within the broader foresight community. Members contributed their experience and wisdom toward shaping a set of competencies for the government futurist, described in the next box story.

## FUTURES FUNCTIONAL COMPETENCIES IN BRIEF

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The set of Futures Functional Competencies developed by CSF aims to answer the question of what critical behaviours and attributes are required by futurists in government as they work to ensure that the public service can effectively navigate a rapidly changing and increasingly complex operating environment. It is also intended to help improve transparency in and understanding of how the public service selects, assesses, trains and develops Futures officers – thus empowering officers in Futures-related roles in planning their development and career goals.

In thinking about what this set of competencies should be, CSF identified four distinct but not mutually exclusive archetypes of futurists in the Singapore government: the *Analyst and Synthesiser*, the *Translator*, the *Community Mobiliser*, and the *Institution Builder*. These archetypes were adapted from those developed by the Institute for the Future (ITF) and were intended to capture the broad range of futures work across government (not just at the Centre).

The *Analyst and Synthesiser* absorbs and synthesises information from diverse sources at multiple scales; and creates frameworks and metaphors for understanding change. They scan for emerging issues, and deep-dive into research projects. The *Translator* transforms material into specific, dynamic organisational languages and realities. They signpost and monitor change, communicate insights to policy audiences, and support strategy and policy reviews. The *Community Mobiliser*, in capturing the “people” aspect of futures thinking, engages people around ideas, creates momentum, and

leverages networks. They may organise roundtables, workshops and brown-bag sessions, as well as deliver training and other developmental activities. The *Institution Builder*, in capturing the importance of stewardship and culture-building in futures thinking, nurtures the futures ecosystem and exercises thought leadership. They act as consultants supporting agencies establishing in-house futures capabilities or working on futures projects, participate in exchanges with external partners, and represent their organisations at international fora and conferences.

Based off these archetypes, and drawing from existing databases, the CSF developed a draft set of competencies that broadly encapsulated the skills and attributes of a futurist in government. The team tested these competencies, first against the team's own experience in doing foresight work, then with the wider futures community. The CSF ultimately landed on a set of five:

- Researching and Making Sense of Uncertainty
- Communicating Complexity to Diverse Stakeholders
- Building Relationships with Thinkers and Doers
- Fostering Generative Conversations
- Developing Futurists in Government

Taken individually, the competencies do not look like rocket science. However, as a set, they identify the combination of skills and attributes that allows a futures officer to produce quality foresight work, and to create impact. For instance, many officers do research work, but the futurist must identify, investigate and discuss issues that are yet to materialise, and communicate these complex, emerging issues to a non-expert audience. These competencies also identify and value skills not typically considered part of a futurist's skillset, such as organising and delivering training and developmental activities to strengthen futures thinking in government.

## WHAT LIES AHEAD

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Looking back at the path strategic foresight in government has taken, from the early days of scenario planning to the Centre's current embed within the Strategy Group, there has clearly been one constant: change. Rather than resting at equilibrium, the Centre continues to look ahead, seeking to anticipate – and shape – the next evolution of our foresight ecosystem in the years to come.



# STARTING A FUTURES UNIT

## A CHEAT SHEET

SHARMINI JOHNSON



FIG 3.1 DIGITAL ECOLOGY

Sharmini Johnson is Lead Strategist (Futures) in the Digital Strategy Office, Ministry of Communications and Information (MCI).

## MCI'S ROLE & RATIONALE FOR FUTURES SET UP

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The Ministry of Communications and Information (MCI) is Singapore's lead ministry in the Digital domain. It oversees developments in domains of Digital economy, society and security to ensure Singapore is well placed to capture the opportunities and manage the risks from Digital. This includes working with our partner agencies to oversee the infocomm technology, cybersecurity and media sectors; libraries and archives; as well as Government's information and public communication policies.

The digital domain has been disrupted significantly over the years, with states, businesses and people constantly adapting to harness opportunities and combat risks. The COVID-19 pandemic added further stress to this endeavour. It was against this backdrop, in 2021, that MCI set up its Futures team. Its mandate was to help the Ministry make sense of the myriad disruptions accelerated by the pandemic, and to help it be better prepared for the uncertain future ahead. While our fledgling unit is still evolving, here are some tips from our journey so far.

## ORGANISE MANPOWER RESOURCES CREATIVELY, TO MEET MULTIPLE TARGETS IN THE SHORTEST AMOUNT OF TIME

MCI Futures was designed as a core team of two Futures officers supplemented by a larger team of ten to twelve “part-time” officers from across MCI’s agencies, with domain expertise of MCI’s work.

This model accomplished two objectives:

- Multi-faceted capability development: the team simultaneously built futures skills and domain knowledge through the course of the work.
- Diversity of views: this enabled rich insights to be developed, while raising trade-offs between policy outcomes. This facilitated robust discussions with senior management. This also reduced blind spots.

## FIVE TIPS FROM OUR JOURNEY

### ADOPT AN OPEN AND CONSULTATIVE APPROACH WHEN DESIGNING THE TEAM’S VALUE PROPOSITION

Few leaders in the organisation had had the opportunity to understand how the products and processes would complement or align with their division’s work. It was also important for the team to gain a deep understanding of the organisation’s purpose and mission. The core team met with the Directors of policy divisions to learn about current and future policy concerns.

These conversations were valuable in that they provided us with:

- A broad sense of the organisation’s underlying assumptions that would need to be challenged, as well as how to introduce Futures thinking to the organisation.
- Topics that the Futures team could develop to complement and stretch organisational thinking in Digital, such as emerging technology.
- An opportunity to identify allies who would be supportive of the work, as well as skeptics whom we would need to convince (or at least be tolerated by).

## WORK WITH THE EXISTING ECOSYSTEM OF RESOURCES AVAILABLE

Given a lean core team we leveraged existing Whole-of-Government (WOG) products and platforms where feasible. Once the team had scoped out a research question, we synthesised new signals with relevant research already available from across the Futures and larger government/ partner agency ecosystem. For example, the Centre for Strategic Futures (CSF) Driving Forces (DFs) deck was a regular feature at our meetings and was useful to give the team a “quick and dirty” shortlist of DFs as starting points. We also worked with futures units across government to build on their past or ongoing research.

The result of this approach included:

- Minimising the duplication of work both within and across agencies.
- An alignment with common vocabulary across government, and organically plugging into WOG conversations to ascertain preoccupations and ideas.
- Revealed assumptions and blind spots that MCI could address, where relevant to the Digital domain.



## DIVERSE EXTERNAL VIEWS ARE IMPERATIVE, NOT JUST FOR A ROBUST PRODUCT, BUT A ROBUST TEAM

We supplemented our desktop research with views and opinions from local and international external experts in academia and industry, both within and outside of the Digital domain. We tapped on the extensive network of experts that our divisions and senior leadership had cultivated, while continuously seeking out new networks of thinkers and experts. We took our work to CSF's Futures Sandbox platform as well as to the Organisation for Economic Co-operation and Development (OECD)'s Government Foresight Community meeting in 2022 to seek feedback on our topics/scenarios and gather more signals.

We received excellent feedback from our network who pushed the team to think more divergently and question our assumptions. They also gave us timely, relevant and unique insights. Regular interactions with external networks also provided the team with opportunities to pick up signals beyond desktop research. Building these close relationships with thinkers was also helpful for policy teams to tap when relevant.

## BE AGILE WITH THE TEAM'S STRUCTURE AND OUTCOMES

Tech futures continues to be more dynamic than most domains. New technologies and their impacts surface at breakneck speed. Over the past three years, the team's products have evolved to suit the organisation's need for quick sensemaking, while balancing demands on quality research with limited resources.

In 2021 we developed short summaries of ongoing tech developments with policy analysis alongside extensive projects (The Future of Digital Life – see pages 18 to 21) that took months to complete. Both were valuable and generated rich discussions

and new ideas about the Digital domain, but larger research projects took significant time for in-depth research, while limiting valuable time for interaction with our stakeholders as a fledgling unit. Managing a team from across divisions presented many challenges on its own. Furthermore, we realised that our initial ten-year scenario time horizon (while useful to stretch our thinking) did not realistically reflect the rapid shifts in the Digital domain, where signposts appeared within 1-2 years.

In 2022 and 2023, the team did shorter sprints of 12-16 weeks to produce research that could quickly provide an overview of emerging tech (e.g. Web 3). With guidance from our senior management, we anchored our projects on a 3-5 year time horizon and worked with a relevant policy unit to surface potential next steps. Where useful, we supplemented the research with a series of roundtables with notable experts on relevant topics such as Artificial Intelligence. This enabled us to have a regular cadence of futures thinking inoculated into the organisation. In 2023, the Futures team became part of MCI's Digital Strategy Office, bringing the Futures and Strategy functions together. This meant that while the Futures team could continue its work in scouting the horizon, it was more closely informed by strategic priorities. The Strategy team was better supported by Futures thinking and foresight tools, while it developed concrete proposals on new policy moves. Recognising the fast pace of change in the digital space, the Futures team also worked on building capabilities for sense-making across the organisation, to better equip policy teams with basic foresight tools.

## CONCLUSION

Overall there is no one-size-fits-all approach to starting and maintaining a Futures team. We are fortunate to be part of an organisation that had a growth mindset and thoughtful leaders to guide us. Our journey to build the repertoire of work and skills continues as we work with our divisions and partners on new topics (e.g. Generative AI).

# THE FUTURE OF DIGITAL LIFE

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In 2021, the team had picked up signals of change in Digital Society that could require us to reimagine identity, community and cohesion. To explore these plausible futures, the project imagined society not just enabled by digital, but one that would exist in a digital realm (substantively even if not totally).

We hypothesised that the speed and pervasiveness of these digital developments had started to precipitate: An increased blurring of offline and online identities, relationships and activities, such that society occupied an omnipresent “hybrid world” where physical and virtual facets of lived experience were integrated. The instantaneous “doubling of place”, as individuals experienced their

physical body/environment, separate from the interactions taking place online. As a result the current paradigm around “real” versus “virtual” was increasingly called into question especially since the online sphere enabled access to experiences that were formerly only available in the offline world.

We identified 4 Driving Forces (DFs) that explored the co-evolution of technology and society (Fig 3.2.1) and suggested that the DFs would have an impact on three layers of change that would cumulatively alter the organising principles governing socio-economic life, redefining the ways in which people connected, built communities, and created economic value (Fig 3.2.2).

**FIG 3.2 DRIVING FORCES 2040: “THE AUGMENTED SELF”**



DRIVING FORCE (DF)	BRIEF DESCRIPTION	POTENTIAL UNCERTAINTIES AND TENSIONS
RISE OF IMMERSIVE DIGITAL EXPERIENCES	Technological developments and user demands fuel the shift towards more immersive experiences.	An increased use of immersive technologies or a shift towards living a more authentic physically present life.
GROWING PRESENCE OF INTELLIGENT VIRTUAL BEINGS AND ASSISTIVE TECHNOLOGIES (E.G. ROBOTS) IN EVERYDAY ACTIVITIES	Virtual beings and robots are deployed for a variety of uses (e.g. to augment resource constraints).	Assistive technologies could be welcomed or rejected as part of daily life.
EMPOWERMENT SHIFTS FROM PLATFORMS TO END-USERS	The democratisation of content creation has empowered end-users such as creators and community moderators.	Platforms could either expand or curtail end-user empowerment tools if it impacts profits; a new group of Super-influencers who command an outsized presence in the virtual world could emerge.
DECENTRALISATION INTRODUCES NEW MECHANISMS FOR VALUE CREATION ONLINE	Individuals and communities have new opportunities to participate economically, using decentralised technologies.	Opportunities could be expansive or limited to a select few and the trend could supplant, die-off or co-exist with existing platforms and structures.

FIG 3.2.1

DIGITAL LIFE NOW

IN THE FUTURE

Digital is a tool; citizens are connected by choice	CONNECTEDNESS	Digital is an environment that pervades all aspects of life — real time and everywhere
Primacy of the physical world; equivalence of “offline” with “real”	PHYSICALITY	Enmeshing and integration of the online and real; no meaningful distinction
Consolidation of trust and authority in Institutions	CENTRALISATION	Distributed, democratised model of influence and power

LAYERS OF CHANGE

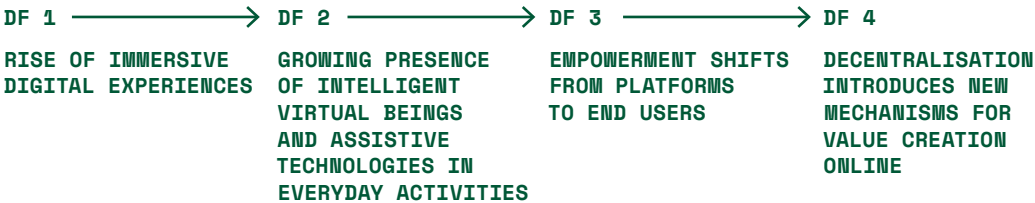


FIG 3.2.2



Our scenarios (Fig 3.3.1) were designed to centre discussions around the core themes of society, economy and security (Fig 3.3.2). While the scenarios stretched our thinking in plausible futures, these discussions presented questions that were important even today.

**FIG 3.3 “WEARABLE DEVICE GRAVEYARD”**

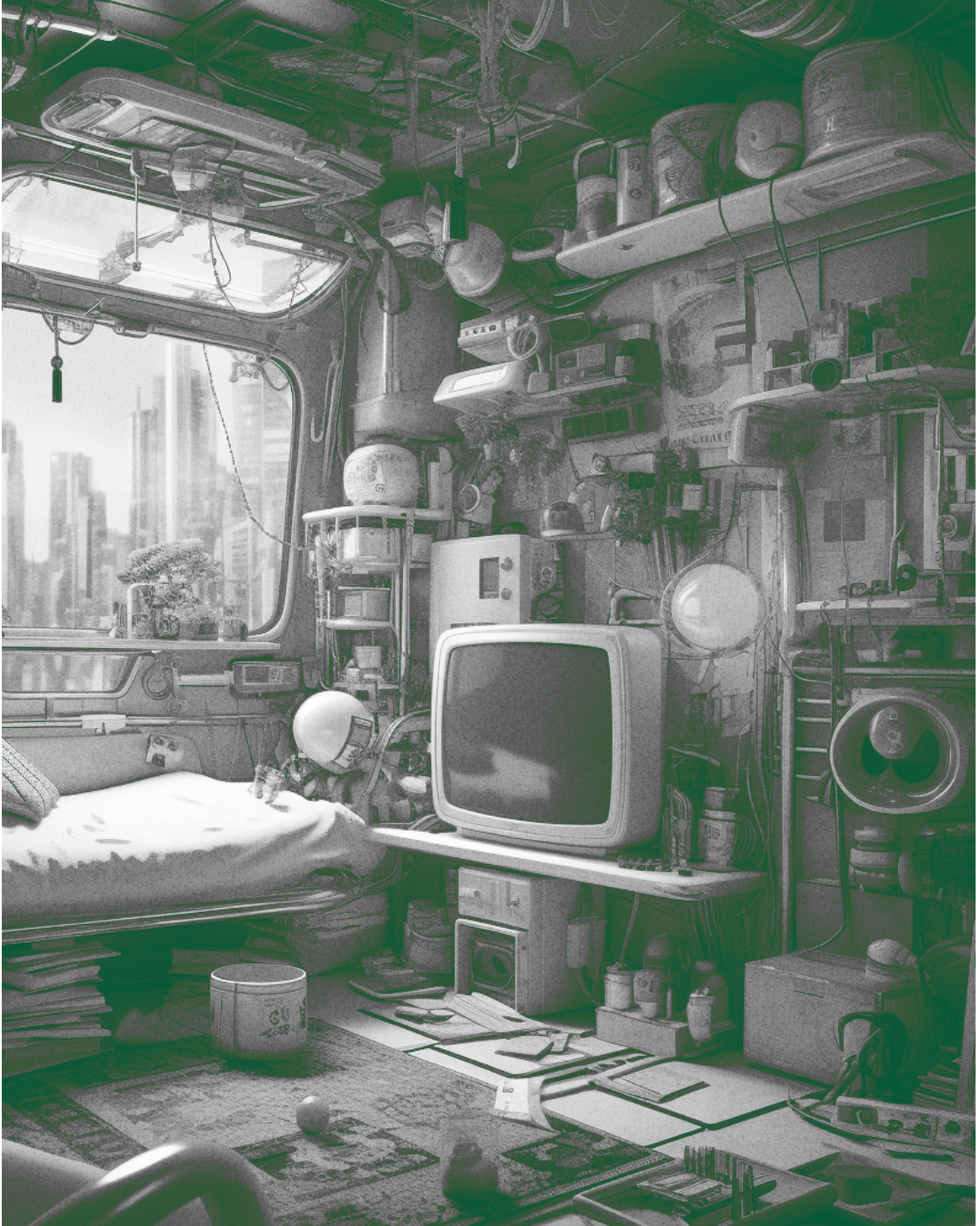


FIG 3.3.1 HEADLINES OF THE FUTURE

<p><b>SPECIAL REPORT</b></p> <p>PARENTS COMPLAIN THEIR HOMES ARE “WEARABLE DEVICE GRAVEYARDS”; APPEAL TO AUTHORITIES TO FIND AN INTEROPERABLE SOLUTION</p>	<p><b>EXCLUSIVE NEWS</b></p> <p>FED UP WITH DATA LEAKS, THIS 10-YEAR-OLD DESIGNS DATA MINING BLOCKER PROGRAMMES FOR HIS FAMILY’S DEVICES</p>
<p><b>GROWTH DF 1 &amp; DF 3</b></p> <p>Key feature of Digital Life is <u>optimisation</u>:</p> <ul style="list-style-type: none"> <li>Technology is embedded in everyday life with significant opportunities (money, influence) for most individuals</li> <li>An ecosystem of digital players develops and there is fierce competition to entrench walled garden tech stacks</li> <li>Government plays a facilitative role</li> </ul>	<p><b>DISCIPLINE DF 1 &amp; DF 2</b></p> <p>Key feature of Digital Life is <u>restraint</u>:</p> <ul style="list-style-type: none"> <li>Digital life is stymied – the ethical collection and use of data is a prime concern for citizens</li> <li>Technology platform growth is curtailed by regulations</li> <li>Increased calls for Government to legislate against the harmful aspects of technology</li> </ul>
<p><b>BREAKING NEWS</b></p> <p>CLIMATE DAO REFUSES SALE OF LAST PIECE OF AMAZON RAINFOREST; TUSSLE BETWEEN CONSERVATIONISTS AND GOVERNMENT DEVELOPERS TO BE SETTLED IN GLOBAL COURT</p>	<p><b>LIVE UPDATE</b></p> <p>FIRST AI POLITICIAN CAMPAIGNS ON WIDELY POPULAR PLATFORM TO PRESERVE HUMAN INTELLIGENCE</p>
<p><b>COLLAPSE DF 3 &amp; DF 4</b></p> <p>Key feature of Digital Life is <u>autonomy</u>:</p> <ul style="list-style-type: none"> <li>‘Net States’ shape social values and goals</li> <li>Powerful collectives tokenise resources (e.g. energy) and leverage ownership to dictate terms of use</li> <li>Government is more dependent on Big Tech for infrastructure and services</li> </ul>	<p><b>TRANSFORMATION DF 1, DF 2 &amp; DF 4</b></p> <p>Key feature of Digital Life is <u>multiplicity</u>:</p> <ul style="list-style-type: none"> <li>New societal norms emerge as a proto-metaverse co-exists with norms in territorially bound space</li> <li>Industry innovation is at an all time high</li> <li>Role of government shifts from top-down authority figure to convenor of groups</li> </ul>

## SOCIETY

What levers do we have/need to develop to proactively manage the emerging inequalities of a digitally enmeshed world?

## ECONOMY

What design principles and regulations do we need to develop for an increasingly decentralised, creator-led economy — and conversely, in a potentially winner-takes-all economy dominated by a few large players?

## SECURITY

What new kinds of harms could emerge from a digitally enmeshed world? How could data ethics play a role in mitigating these harms? Do our technology systems need to be designed with values in mind?

FIG 3.3.2

# THE FRUIT OF OUR LABOURS

## DEVELOPMENTS IN THE SINGAPORE GOVERNMENT'S APPROACH TO SCENARIO PLANNING

"Learning can take place only if experience deviates from plan in an unexpected way. If everything happens according to expectation there is no learning."

Kees van der Heijden  
Scenarios: The Art of  
Strategic Conversations

Scenario planning is not a panacea. Like all tools, it is good for some things, but not all things. As craftsmen working on understanding a complex, fast-changing environment, we have sought to expand our options to address the range of tasks that we may encounter. Nevertheless, Singapore has been using scenario planning for some 30 years, since our early experiments at the Ministry of Defence in the mid-1980s, which speaks to its enduring value as a multi-purpose tool in our strategic planning toolbox. (The foresight team at MINDEF, which continues to use scenarios today, has penned their reflections on the value of this tool at page 28. The infrastructure planning community has experimented with using scenarios to support periodic reviews of Singapore's Long-Term Plan for land uses and infrastructure needs. Hear more from them at page 36.) We have learned some lessons about its strengths and weaknesses along the way, and adapted the methodology to suit our evolving strategic planning needs.

Singapore's open economy and multi-cultural, highly-textured society are

deeply interconnected with and reliant on the international economy's ebbs and flows. Emphasis on the value of looking ahead lies at the heart of Singapore's ability to sustain growth and progress, to tap new possibilities and address challenges as they emerge, rather than recognize them only after they have become crises or missed opportunities. Scenario planning has been very useful in helping us identify and better understand the broad and deep forces unfolding around us, and to visualize ways in which these forces might interact and shape our future. In particular, scenarios have been a useful way for the policy community to collectively understand and respond to the interconnections between shifts in Singapore's external operating environment, and Singapore's domestic considerations and constraints. In this way, we hope to avoid the situation Pierre Wack described in his 1985 *Harvard Business Review* article as the inability to see an emergent novel reality as a result of being locked inside obsolete assumptions.

What scenario planning has not been used for – as any good practitioner would



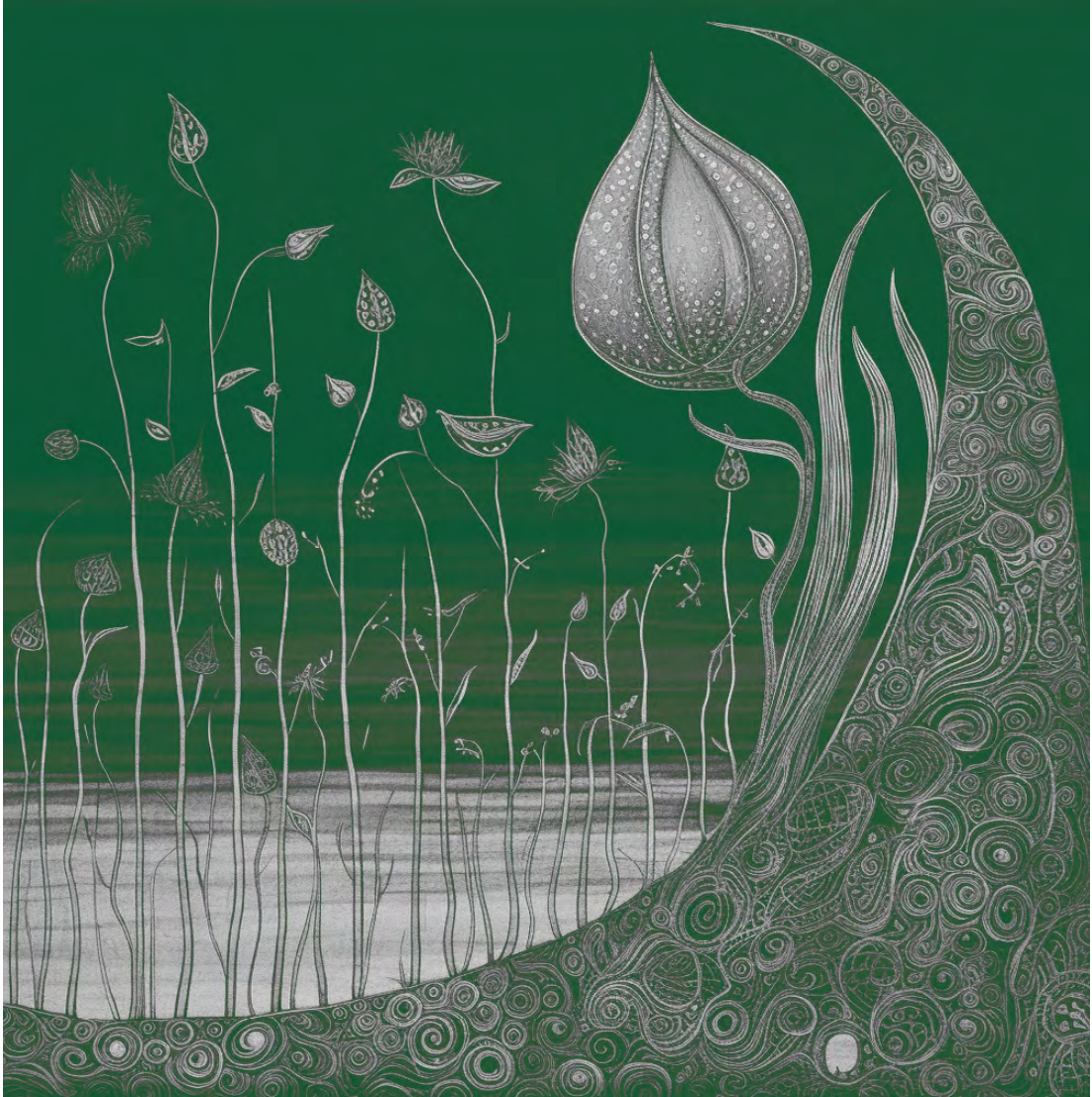


FIG 4.1 CULTIVATE, NOT CLAIM





**FIG 4.2 PRUNE, NOT PERFECT**

tell you – is to predict or claim to forecast a particular future. The team has repeatedly been asked why the scenarios we have written do not outline desired outcomes (“target setting”), or lay out plausible pathways to for us get to desired futures (“strategy”). Our response has consistently been that for the Singapore government, target-setting or strategy delineation is not the point: scenario planning has been used to best effect as an excellent tool for sense-making. By using multiple futures as an analytical lens, we can consider inherent uncertainties in a given situation, laid out against a backdrop of

what we should consider to be predictable, or at least knowable. What we have striven to emphasise is that scenario planning is meant to support good decision-making, and good decision-making today, not tomorrow. It is ultimately about better understanding the present, and the true range of choices open to us at this point in time. The scenarios process helps surface otherwise hidden assumptions we may have about how the world works, and how our operating model works in this context. It encourages us to re-examine our assets and liabilities against a range of future landscapes, and hopefully

open conversations about possibilities that we had not previously seen, or had not previously been willing to discuss. By borrowing the future as a safe space to talk about the present, scenarios allow us to confront the known unknowns, the sacred cows, to think – and to say aloud – the unthinkable. They give us a safe place to make clear-eyed judgements and conduct robust decision-making now, not tomorrow.

Making a regular practice of running scenarios exercises – the government has conducted a major scenario exercise roughly every five years for the last two decades – has also underpinned efforts to create a culture of long-term planning within the Singapore public service. It has been a way of inculcating and entraining flexibility in our thinking and policy-making practices – overcoming the natural drift toward historical patterns, path dependency and ossification that reduces future options. Scenarios expert Kees van der Heijden says in his seminal work *Scenarios: The Art of Strategic Conversation* that scenario planning helps organisations guard against “the worst aspects of the two pathological opposites of groupthink and fragmentation in the organisation”, by providing a pathway for teams to maintain a balance between the need to align and move forward, and the need to keep an open mind. It has certainly served as a good anchor for the Centre’s work to instill habits of mind such as questioning assumptions and seeking to understand the “whys”, not just the “hows”, when formulating and implementing policy.

There is value in the process; indeed in some ways the process is the product. When we focus on the question of “getting it right”, in nailing the predictions, we completely miss the value of the scenario planning process itself. Scenarios are a tool for shaping strategic attention and conversations within an organisation, and

for building the muscle for strategic thinking at all levels. Participants in earlier scenario exercises have reflected that the process changed the way they looked at large-scale issues, gave them an opportunity to discuss this change in perspective in some depth, and helped them grow a network of similarly-minded peers from a range of organisations. These relationships have persisted, even as our alumni have moved on to different roles within the service.

At the most fundamental level, scenario exercises build a shared vocabulary across the organisation for talking about the future: the language of driving forces, critical uncertainties, trajectories. It builds a shared picture of the future, in its complexities and variabilities and ambiguities, that serves as a basis for building alignment around a common agenda. The process helps us realise that the most vexing strategic problems are often cross-boundary problems, and lie at the intersections – often artificial – of how we have come to organise the world, and ourselves, to cope with them. As such, tackling these problems requires the insight and experience of different experts in various domains coming together, both to understand the contours of what lies ahead, as well as devise possible pathways for us to navigate them. One of the greatest value-adds of our scenarios exercises is that they provide a platform for these minds to meet. We bring together experts and practitioners from all domains, from both within and outside of the government, to focus on a single question – what does all this mean for the future of Singapore, and of Singaporeans? Here is where we see the cross-fertilisation, not just of ideas, but of frameworks of thinking, that when applied across domains may result in new insight. Such a process produces that elusive “moment of truth”, where new understanding can drive us to reshape our own future.

## INNOVATIONS IN PRACTICE

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We have not conducted scenario planning exercises for three decades without some innovation around the process. Scenarios can be a resource-intensive process for thinking about the future (which is why the Centre has also invested in seeking out alternatives). Learning by doing has led us to make some conceptual adjustments to how we approach the art of scenario planning, to make the best use of the resources we have at hand, and to achieve the (changing) objectives that we want to achieve.

Every scenarios team has had to articulate, at least to itself, very clearly what its objectives really were. What specifically were they trying to achieve with *this* scenarios exercise? What had they learned from their predecessors about where the team should focus expenditure of its energy and/or resource budget, in order to make the most progress? Because our objectives are many and our resources usually too few, progress seems to always be made via a series of carefully-balanced trade-offs, tailored for each team's present circumstances.

The major challenge each team confronts is a tension between needing breadth of coverage and focusing attention on specific issues. Scenarios teams have often struggled with the expansiveness of their mandate, to identify and delineate all of the forces with sufficient fidelity and depth to do justice to their potential impact, having to avoid losing the audience in a forest of detail, and then choosing which potential effects to include in the eventual scenario narratives. Today, this comprehensiveness finds its expression in a standalone driving forces report. In the early years of our experience, the scenarios were the key -indeed the only- product. In recent exercises, there has been growing demand to understand the ingredients that go into scenario-making, and indeed for agencies to take those ingredients and create their own narratives, distinct from, though related to, the main

storylines produced by the Centre. This is well and good, and speaks to how our audience's attitude towards the scenario planning process has also changed, probably in recognition of the increasing levels of uncertainty and complexity we have to deal with on a daily basis.

However, this of course begged the question of why write narratives at all. Perhaps the megatrends and driving forces could suffice as the basis for strategic conversations, rather than specific narratives, since agencies also seemed keen to customise those for themselves. Several foresight experts, when consulted on this question, replied that scenarios are "threatening", in ways that trends are not, precisely because they focus imagination and attention on particular outcomes. Trends allow us to avoid the difficult questions; scenarios spotlight them. This drove the team's approach to the latest set of scenarios. Rather than cast them as general explorations, mapping the boundaries of plausible space, the scenarios were crafted as lenses to focus attention on particular policy questions, throwing them in sharp relief against the backdrop of a plausible but still somewhat distant future. In a bid to ensure there were interesting details sufficient to hold attention across a broad range of policy areas, the team resisted calls to prioritise between or drop some of the driving forces from the ingredient mix, choosing instead to crunch as much detail and nuance as possible into the writing process. Taking the approach of seeing the scenarios as a set also allowed the team leeway to focus on different forces in each story.

There were, of course, trade-offs as a result of this approach. First, the scenarios team risked getting the focus wrong, or being unable to persuade our decision-makers that these were indeed the strategic conversations they needed (regardless of whether they wanted) to have. In our experience, scenarios teams often struggle with how much to involve



FIG 4.3 HARVEST, NOT HAPPENSTANCE

decision-makers, what role they should play, and when in the process their input would best be incorporated. A good balance on these questions must be struck in order for a scenarios exercise to be useful. The scenarios must cause discomfort to result in change within the system, but not so much discomfort as to be immediately rejected. Second, scenarios crafted in this manner are immensely perishable. Some have criticised them for this. But their transient nature is inherent in the design. The scenarios are meant as a provocation, to kick-start the strategic conversation. If they are forgotten thereafter, they have already served their purpose, so what does it matter? Agencies would still have the broad comfort of the driving forces report, as well as an overall strategy developed in part in response to the scenarios, to help them navigate the uncertain future. Lastly, we have found that these scenarios require strong facilitation in order to achieve the conversations we

want. Given the trade-off between breadth and focus, our choice to retain some nuance and detail in the story-telling has diluted the laser-focus on specific issues that we had wanted to achieve. As a result, we had to speak up for some of these issues in discussion, sometimes by acting as mirrors reflecting to our participants what had been absent – not just present – in their conversations about the scenarios.

In the end, we had to choose not to let the perfect get in the way of the good. But every scenarios team will face the fear and risk that innovation in the process could result in the system losing confidence in its value and validity, or in the system merely going through the motions of thinking about the future. If that day comes, the Centre will have to find another tool and another pathway to galvanise and support the strategic conversations at the whole-of-government level that are the heart of scenarios' merit today.



# DEFENDING AGAINST THE UNKNOWN

Tiffanie Lau & Tan Lian Seng

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Scenario planning, pioneered by the Ministry of Defence (MINDEF), has come a long way since the early 1980s. It was first introduced by Mr Peter Ho, then Deputy Secretary, as a tool to manage risks and long-term planning. Today, our mandate has evolved to encompass a broader set of strategic foresight tools beyond scenario planning, and a deeper focus to translate insights into strategy.

We are at once *incubators* and *accelerators*. We incubate ideas and insights by questioning core organisational assumptions and identifying blindspots. We also accelerate the organisation towards action and change in response to the opportunities and risks.



FIG 5.1 GROWING IN THE WILDERNESS

Tiffanie Lau is a Deputy Director (Strategic Futures) in the Defence Policy Office of the Ministry of Defence (MINDEF). MAJ Tan Lian Seng is a Senior Analyst (Strategic Futures) in the Defence Policy Office of MINDEF.

"We learn best – and change – from hearing stories that strike a chord with us."

John P. Kotter

## SCENARIO PLANNING AS A TOOL FOR ORGANISATIONAL CHANGE

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Scenarios have emerged as a foresight tool of choice among practitioners, because of its ability to bring leaders and planners on a conversational journey around the organisation's "sacred cows" or "black elephants" (i.e. *an often ignored problem that is predictable and high impact until it becomes too late to address*).

We are already in the business of looking long term – defence R&D and weapon acquisitions require investments over years, if not decades – and it would be challenging if our organisation needed to make major course adjustments, late in the game. By applying scenario planning, we can drive

timely tweaks to our policies, strategies and plans so that our organisation remain resilient and anticipatory over time.

But before the organisation is able to translate the insights into strategy, key parties in the organisation first need to be convinced of the salience of these new insights among many other competing priorities. They must *feel* compelled by the insights, and want to devote resources to act in response.

This is where we have learnt to blend strategic foresight with organisational change management to bring stakeholders along with us on the journey so that the insights are as much theirs as they are ours.

Incubation involves identifying strategic issues and the “so-what” for the organisation.

## INCUBATING THE “SO WHAT”

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*Incubation* was as much a discovery process for the organisation as it was for ourselves in the futures team. This involved identifying strategic issues and the “so-what” for the organisation. In the process, we discovered three key lessons.

First, confidential interviews can serve as ‘therapy’ for the organisation. We conducted one-to-one confidential interviews with senior leadership. Crucially, these interviews created a safe space for the person to speak unfiltered, and to speak to issues that the organisation should pay more attention to. The interviews allowed us to identify green shoots of thinking as well as deeply held organisational beliefs and assumptions. One example was the assumption that a greener, more sustainable defence would negatively affect operational readiness.

Second, engagements had to be viewed as a process of push-and-pull with experts and stakeholders. We engaged with subject matter experts from within and outside the organisation, planners and practitioners, through workshops. These workshops zoomed into specific driving forces shaping our operating environment, such as the topic of climate change. It was a platform for us to test ideas, but also a platform for the experts to

articulate and then question their own assumptions, or for them to test new ideas that they may have developed over the course of their work. This push-and-pull effect had the result of making our findings robust, and warming our stakeholders up for the subsequent discussions on strategic shifts by the organisation.

Finally, we found it useful to develop scenarios with a clear end in mind. By this point, several ‘sacred cows’ and ‘black elephants’ had already begun to emerge. It was clear that the organisation needed to start having conversations about these ‘cows’ and ‘elephants’ and think about the potential shifts required.

It was not to say that we did not face challenges. *First*, it was difficult to preserve capacity for futures work amidst intense and competing demands on the public sector in response to the COVID-19 pandemic. *Second*, we faced challenges in convening in-person workshops and discussions given the national restrictions, and it was difficult to recreate the same level of dynamic and creative exchange of ideas through virtual means. *Third*, we had to build appetite within the defence sector to develop a set of down-classified materials that could be shared with the wider government.

We found ourselves having to rapidly test, fail, and adjust so that we could navigate and help the organisation leap from concepts into strategies.

## ACCELERATING CHANGE

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The hardest step was in translating the insights to strategy. *Acceleration* involves agitating for concrete action, but traction is often difficult to gain.

A common, natural enemy of futures is scepticism – Futures products have too many uncertainties and too many possible trajectories, and this makes it difficult for policy makers to decide how to move forward. Futures products are not immediately relatable to policy makers, because the worlds described only have a small probability of occurring. Or, there is insufficient granularity on the associated threat, and that makes it difficult to develop detailed contingency plans.

These are familiar complaints about scenarios and the scenario planning process. So the initial inertia becomes a wall keeping the organisation from making a change.

There was thus a need to break that big leap into two steps: first, to gain mindshare, which required a human or emotional element; and second, once the stakeholders were convinced of the need to act themselves, they had naturally incorporated the action into their respective workplans. In each of these steps, we found ourselves having to rapidly test, fail, and adjust so that we could navigate and help the organisation leap from concepts into strategies.

While our scenario discussions were typically framed as informal and open-ended, there was always a specific strategy follow-up

that we aimed to develop from each discussion. The scenarios raised questions that demanded answers, and we would steer the conversation towards some convergence on what follow-up action could be taken towards getting those answers. This might include understanding the scope of the issue, e.g. the role of defence in climate change, or taking steps to level-up institutional knowledge, e.g. emissions accounting.

We remained actively engaged in driving the strategy follow-ups from the scenario project. These follow-ups would usually be multi-year in duration, and involve many parties across government and the defence ecosystem. In cases where the institution needed time to build up knowledge and structures, we would be heavily involved in the process. In cases where there was a clear domain owner able to drive the follow-ups, we would take a back seat.

We also pursued a ground-up “guerrilla campaign” to socialise the wider organisation to the ideas contained in the scenarios. We ran scenario workshops with people at various levels within MINDEF and other agencies working on security matters. Individual by individual, our objective was to influence the big organisational assumptions over time. We also stayed alert to topical issues that the organisation was seized with, to seed conversations. Looking back, no single method worked best and our biggest advice to futurists is be persistent and be willing to test new approaches.



MINDEF's "An Existential Challenge" Scenario:

Intergovernmental Panel on Climate Change report estimates that militaries account for nearly 70% of government emissions. At the 45<sup>th</sup> UN Climate Change Conference of the Parties (COP45), more than 50 countries commit to net zero militaries by 2060. The energy transition for militaries is fraught with difficult operational trade-offs.

Fifth-generation fighters burn 60% more fuel per hour compared to older fighters. Militaries that fail to invest in lower-emissions platforms are the target of public wrath. As the climate crises rage, militaries struggle to cope with heatwaves, floods, and other extreme weather conditions. Across every region, militaries are exhausted from the high tempo of Humanitarian Assistance and Disaster Relief missions.

## SCENARIO PLANNING AS A TOOL FOR ORGANISATIONAL CHANGE

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One success story from incubation to acceleration is MINDEF's efforts to incorporate climate change more systematically into the organisation's priorities. With climate change increasingly entering into discourse within the defence sector, we are glad to see strong traction within the organisation and recognition of the need for defence to respond to climate security threats and mitigate its impact on the climate.

Today, our organisation has developed strategies to reduce MINDEF's carbon footprint and to prepare for the impacts of climate change. In 2021, we established the SAF Sustainability Office to drive sustainability efforts across the Services. In 2022, we established the External Advisory Panel for Environmental

Sustainability with experts in the fields of green buildings and infrastructure, zero waste, green fuels, and advanced propulsion. To more systematically drive MINDEF's climate change strategy, we set up internal structures to provide strategic guidance and see through the implementation plans for mitigation and adaptation. We promoted knowledge sharing and capability building, through learning journeys, information exchange with overseas counterparts, and workshops run by think tanks and academia.

This process took time, and regular reminders about the impetus for change. It required some efforts at wayfinding, to identify the right people to bring into the conversation, and to sustain the momentum.

“Foresight cannot work in a silo, and MINDEF does not have a monopoly on insights.”

Chan Heng Kee  
Permanent Secretary (Defence)



FIG 5.2 GROWING APART

## MINDEF AS PART OF A NETWORK IN GOVERNMENT

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National security is increasingly cross-cutting and complex, and will continue to be so for the foreseeable future. Cyber risks and fake news are no longer just within the remit of selected government agencies. COVID-19 also highlighted the salience of public health, supply chains, and food security to national security.

It is for this reason that foresight cannot work in a silo. MINDEF does not have a monopoly on insights, and cannot take

action alone. Over time, we have increasingly broadened our collaborative efforts with other agencies, to exchange data and information to form a collective picture of our future operating environment, and to talk about the areas which we ought to pay more attention to. As an example, our scenario planning process is designed to complement the Centre for Strategic Futures' National Scenarios exercises.

## A FUTURES TEAM'S CHALLENGE

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Being able to provoke the system into disrupting itself, while also being trusted enough to drive the necessary changes is a demanding balancing act. It requires close understanding of the organisation, its priorities, its culture, and its internal dynamics.

In every organisation, there is the pressure to turn the 'so-what' into action and results. While our policy instincts may push us towards swift action, scenario and futures work is complex and requires time and effort to incubate, and then to translate into strategy and sustain momentum. This requires a delicate balance between addressing the "here and now", whilst not neglecting the important incubation work to uncover new emerging issues. We continue to navigate these two challenges as a futures team in MINDEF.

## LOOKING BEYOND 2040

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Past success is also no guarantee of future results – we continue to seek out new ways of doing things, and to sharpen our saw. It requires investment in research, capability building and networking – even if these efforts do not yield immediate result. If we manage these tensions well, we can create a strong foundation for the future and drive meaningful change in preparation for the potentially wild scenarios ahead.



FIG 5.3 GROWING BEYOND





# LONG-TERM PLAN REVIEW APPROACH

GIAN JIAN XIANG

Singapore is a small city-state with limited resources. To thrive and prosper, we leverage globalisation and open our economy to bolster connectivity, whether in terms of trade, finance, information or the movement of people. Yet, our connectedness to the world makes us susceptible to the volatility of global trends, as evinced by the challenges brought about by the COVID-19 pandemic. The looming spectre of climate change also continues to threaten our food, water and energy security.

The complexity and uncertainty of our operating environment are compounded by the challenges in planning for a land-scarce country that is becoming more developed. Not only do planners need to consider housing, green spaces, offices and industries, ports and airports, and military training areas within the confines of a small island, we must also contend with the evolving needs of the population. This includes meeting the

needs of an ageing population amid declining fertility rates, changing housing aspirations of Singaporeans and growing attention being paid to heritage and nature conservation.

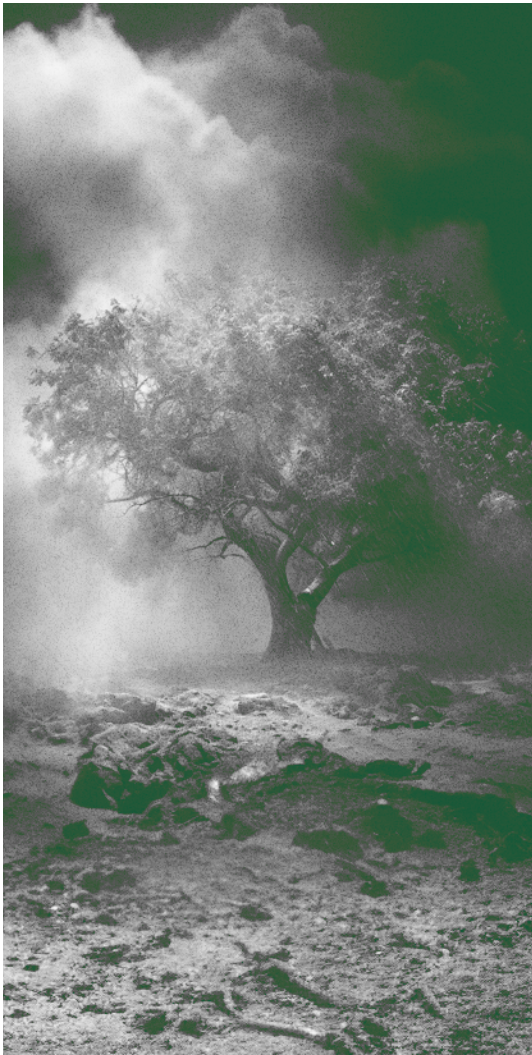
Thus, the Urban Redevelopment Authority (URA) adopts a long-term planning approach to steward Singapore's limited land supply and ensure a sustainable living environment for citizens today and in the future. One of the key components of URA's long-term planning framework is the Long-Term Plan. Previously known as the Concept Plan, the Long-Term Plan has guided the development of Singapore by mapping out strategic land uses and infrastructure needs over a 50-year horizon and beyond since the first Concept Plan in 1971. The Long-Term Plan is reviewed every 10 years, with URA concluding its latest Long-Term Plan Review (LTPR) in 2022 that considers land use plans and strategies for the next 50 years and beyond.

Gian Jian Xiang is an Executive Planner in the Strategic Planning Group of the Urban Redevelopment Authority (URA).

## THE LTPR APPROACH

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FIG 6.1 THE TEMBUSU AND THE ELEMENTS

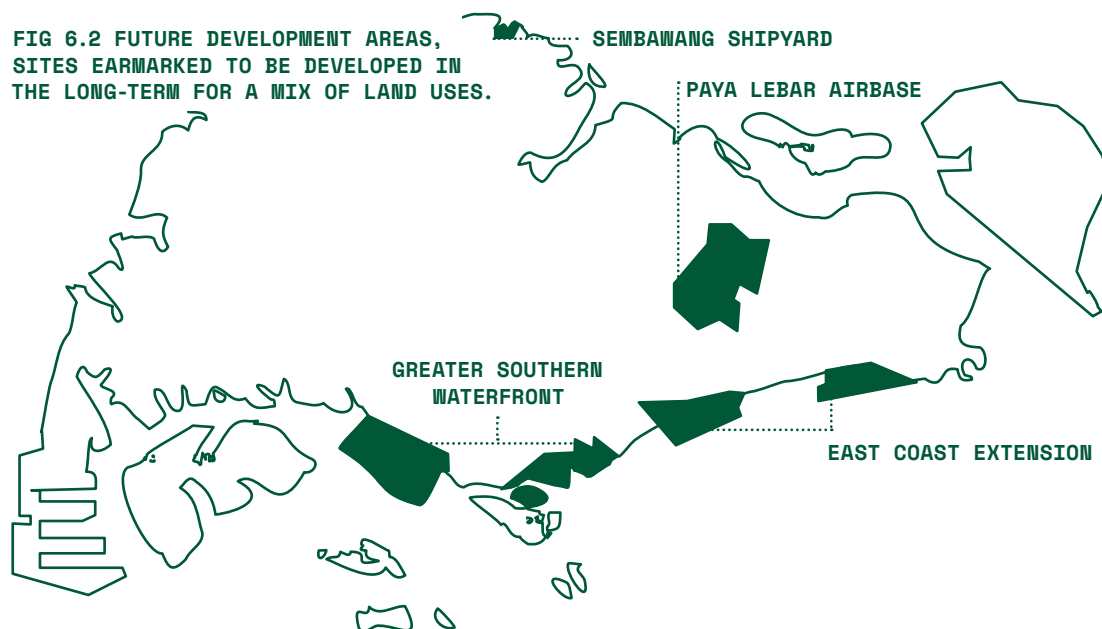


In conducting the LTPR, the URA planning team had identified the trends that Singapore needs to be prepared for. In particular, we recognised that COVID-19 has transformed and accelerated some of these trends and impacted the way we live, work and play. Thus, to respond to the increasingly dynamic and uncertain future, we decided to take an approach that focused on optionality, flexibility and resilience in drawing up the Long-Term Plan, projecting the possible range of land demand in different scenarios. This new approach to the LTPR would enable us to examine the possible futures in a systematic manner and identify decisions and strategies to respond to different planning outcomes.

One of the steps we took was to work with numerous thought leaders and domain experts from different sectors to carry out deep-dive studies of emerging trends and structural shifts. The goal was to stretch our thinking of conventional expectations and deepen our understanding of drivers of change to develop a range of possible scenarios and planning strategies. Three types of drivers of change emerged that would guide our planning strategies:

The first was “known knowns”, which were planning constraints we were cognisant of. For these, we had worked closely with different stakeholders to develop creative solutions that circumvented these constraints and enabled us to meet our planning objectives. For example, one of our planning strategies for the LTPR was to extend Singapore’s network of green and blue spaces within our limited supply of land. To enable this, plans were made to create more multi-functional green and blue spaces that can support the nation’s natural ecosystems and at the same time, be used for nature-based recreation.

**FIG 6.2 FUTURE DEVELOPMENT AREAS, SITES EARMARKED TO BE DEVELOPED IN THE LONG-TERM FOR A MIX OF LAND USES.**



We had also considered “known unknowns”, trends that we were aware of but were uncertain on how they would pan out. In response, we modelled the range of possible land and infrastructure implications, and developed plans that would be flexible and adaptable to different scenarios. For example, the pandemic revealed that telecommuting was possible for certain types of jobs. If more people telecommuted for work, there would be a lower demand for office spaces. Conversely, if Singapore’s economy became more service-oriented, this could drive up office space demand. Thus, we reconciled these different trends and demand scenarios by safeguarding enough office sites that can meet the upper bound of their projections in the Long-Term Plan. A portion of these sites had been safeguarded in the form of “Option Areas”, which was a new concept introduced in LTPR. These sites can have multiple land use options, like housing and industry, to give planners the flexibility to activate them accordingly to meet future needs.

Lastly, there were the “unknown unknowns”, or black swan events that would be difficult to foresee. To cater to them, spaces termed as “Future Development Areas” have been set aside within the Long-Term Plan. Paya Lebar Air Base and the future Greater Southern Waterfront are two examples

that were identified and earmarked to be developed in the longer term for a mix of possible uses including housing, industry and recreation, which will be subject to further review. Until then, we will continue to study and adjust the proportion of land uses in these areas closer to their implementation, depending on how future trends pan out. We also safeguarded Reserve sites around Singapore that can be activated quickly if required. For example, some of these Reserve sites were triggered for quarantine facilities and temporary housing during the COVID-19 outbreak. Having such spaces would ensure that plans can be more flexible and resilient in response to a more dynamic and uncertain future.

Another way that the URA planning team sought to ensure resilience and relevance in the plans was to establish a framework to understand how trends pan out. Following the conclusion of the LTPR, we are currently developing a signposting framework to guide planning decisions and facilitate more agile planning responses. The framework will capture key indicators to enable us to track how the identified trends and possible scenarios may pan out. It will also highlight to us when and how we should adjust our long-term plans or activate contingencies like the “Option Areas”.

MORE DETAILS ON  
LTPR E-PUBLICATION



## PUBLIC ENGAGEMENT

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Parallel to drawing up the Long-Term Plan, the team had also conducted an extensive year-long public engagement. This was a major aspect of the LTPR to ensure that the Long-Term Plan was relevant and responsive to public feedback. The objective was to gather people's ideas and aspirations on the future land use plans and strategies.

The public engagement comprised four phases. The first phase was conducted through polls and workshops to get citizens and stakeholders to articulate the values that were important to them in Singapore of the future. Through this phase, the participants envisioned for Singapore to be inclusive, adaptable and resilient, sustainable, as well as vibrant and distinct. We then conducted facilitated discussions in the second phase and invited people to share their ideas and strategies to achieve the envisioned future. The third phase converged on key strategies and saw the Minister and Second Minister

of National Development engaging with people through online round-up dialogues on certain strategies distilled in Phase 2 and the trade-offs required.

The public engagement culminated in the LTPR public exhibition, where we showcased the broad land use and planning strategies structured around seven key themes – LIVE, WORK, PLAY, MOVE, CHERISH, STEWARD and SUSTAIN. These plans were also aligned with the people's envisioned future distilled from the Phase 1 engagement. The exhibition was held at the URA Centre, where we conducted tours for members of the public and stakeholders. Thereafter, the exhibition roved across five heartland locations like Our Tampines Hub and Toa Payoh HDB Hub to broaden public outreach. All in all, we engaged 15,000 people from all walks of life and almost 200,000 people visited the physical and online exhibition.



## REFLECTIONS AND CHALLENGES

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As a major land-use planning exercise with national-level impact, the LTPR necessitated a whole-of-government approach. To tap on the various government agencies' expertise, we worked closely with them in studying the various trends, devising the planning strategies, and drawing up the Long-Term Plan. This collaborative approach enabled the land use plans to incorporate diverse views, while injecting inclusivity and robustness into the planning process.

Having said that, extensive change management was still required when managing and working with other agencies as the approach to develop the Long-Term Plan was new to them and had implications on how they had typically formulated methodologies and processes. To achieve our desired outcome, more time and discussion were required to agree on the methodology and alignment of the figures used. Seeking buy-in early and endorsement at relevant forums were also useful to align vision and expectations amongst agencies.

Another challenge arose from COVID-19, which struck during the LTPR exercise. Not only did the URA planning team have to relook at our planning strategies to incorporate the trends brought about by the pandemic, we also had to evaluate whether the trends observed were temporary or would become part of our new normal. Coupled with the increased uncertainty in industries and sectors like air travel and

tourism, many agencies also did not have definitive outlooks for the future and took time to provide possible forward-looking outcomes. Nonetheless, the reality of the uncertain future further anchored the need to develop the Long-Term Plan in a manner that could respond to evolving trends and various future possibilities, and we worked with agencies to reach a consensus. This provided a strong foundation in steering future reviews to formulate more robust plans.

The extensiveness of the public engagement also reflected our belief in the importance of involving people along Singapore's foresight and planning journey. Members of the public have a role in shaping their living environment, and the many forms of the engagement served as platforms for them to share their concerns, hopes and aspirations for the future of Singapore. For example, many people acknowledged Singapore's ageing population and suggested ways to cater to the changing demographics. Many also noted the mono-use nature of the Central Business District and provided ideas on how it can be injected with vibrancy beyond office hours. These ideas and feedback helped to further refine our planning strategies. In a sense, by involving the people and private sectors in the planning process, the approach to LTPR transcended from a whole-of-government effort to one that was whole-of-nation.

## CONCLUSION

Moving forward, we will continue to apply foresight techniques and plan for the long term to navigate an increasingly uncertain and complex operating environment. We will regularly review our plans to ensure the plans stay relevant amid evolving trends and needs. Following the LTPR, the next Master Plan Review will be the subsequent major opportunity to continue working with our trusted partners as URA translates the broad brush and conceptual strategies of the Long-Term Plan into nearer-term plans for the next 10 to 15 years at a more granular level.

# AFTERWORD



FIG 7.1 HEY ALICE

"Curiouser and curiouser."

Alice's Adventures in Wonderland, Lewis Carroll

Each new day that passes in the 21<sup>st</sup> century makes us question whether we have somehow fallen down the rabbit hole into Lewis Carroll's Wonderland, full of fantastical imagery, strange characters, and wondrous happenings. What do we make of a world that gets curiously and curiously the more you look at it and think about it?

Alice's journey is a quest for self-discovery. Her encounters with illusions, paradoxes and strange occurrences leave her questioning her sense of reality, the ground beneath her feet. Wordplays, puns and nonsense language lead to (deliberate) misunderstandings and attempts to manipulate the way Alice sees her world. And a sense of helpless chaos permeates Alice's meanderings through Wonderland, familiar to any of us who have been trapped in a dreamland racing for an exit, or a plane, or an examination room that seems just around the next corner, forever out of reach.

But Alice perseveres. We can all learn from Alice.

First, open-minded exploration, curiosity, and playful imagination can help us navigate a world where change is constant and the future uncertain.

Second, flexibility and resilience are key to surviving the unexpected twists and turns of our 21<sup>st</sup> century Wonderland, rather than sticking rigidly to a predetermined plan. But sometimes, being stubbornly persistent (even if it is frustrating) can be the right path too. So use your judgement wisely.

Third, communicating clearly and creating shared meaning have power in a complex and interconnected world.

Finally, Alice teaches us the singular importance of self-awareness when navigating the erratic, unsettled and volatile environments that we find ourselves in. Being in touch with our emotions, thoughts and behaviours allows us to stay grounded, to make better decisions in different situations, and builds resilience by helping us to identify both positive and negative patterns and develop strategies in the face of adversity.

To our future Alices, who will encounter even stranger, curiously, and wilder worlds than we have in our Wonderland thus far, we offer you these ideas to navigate by: Remember who you are. Remember why you are on this quest, and the others who walk through your Wonderland beside you. Tweedle Dees and Tweedle Dums, Jabberwockys, and Cheshire Cats will litter your path, but do not be distracted. You are our hope for tomorrow, for a sustainable, just, resilient future. Be well.



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DESIGN BY FANTASTIC BUREAU

ARTWORKS BY GENERATIVE AI

DESIGN: AKIN TO A FORESTER'S JOURNAL, DOCUMENTING SPECIMENS AND PRACTICES, VOLUME 3 IS A CONTEMPORARY REIMAGINING OF AN ANTIQUARIAN BOTANICAL PUBLICATION. THE COLLABORATIVE APPROACH OF THE ARTICLES, LIKE A DIVERSE ECOSYSTEM, ALLOWED FOR DYNAMIC ART DIRECTIONS UNDERPINNED BY OUR CULTURE, FLORA, AND ART. THE STRATEGIC NARRATIVES BEHIND THE CONCEPT WAS APROPOS WITH THE EMERGENCE OF GENERATIVE AI. THESE AUGMENTED VISUALS SERVE AS A SOFT COMMENTARY ON TECHNOLOGICAL ADVANCEMENTS SINCE THE PAST VOLUME.

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