

# CONVERSATIONS FOR THE FUTURE



VOLUME I

Singapore's  
Experiences with  
Strategic Planning  
(1988–2011)



# CONVERSATIONS FOR THE FUTURE



VOLUME I

Singapore's  
Experiences with  
Strategic Planning  
(1988–2011)

©2011 Public Service Division, Singapore  
All rights reserved.  
Public Service Division, Prime Minister's Office  
100 High Street, #07-01 The Treasury  
Singapore 179434  
Fax: (65) 6332-8932  
Website: [www.psd.gov.sg](http://www.psd.gov.sg)

ISBN 978-981-07-0417-9

This book, or parts thereof, may not be reproduced in any form or by any means, electronic or mechanical, including photocopying, recording or any information storage and retrieval system now known or to be invented, without written permission from the Publisher.

Printed in Singapore

Design and Production by Silicon+

# CONTENTS

- 02 **FOREWORD**
- 04 **INTRODUCTION**
- 08 **CHAPTER 1**  
A Historical Overview
- 22 **CHAPTER 2**  
Complexity, Cognition and  
the Challenge of Communication
- 36 **CHAPTER 3**  
Capability-Building
- 41 **CHAPTER 4**  
Connections and  
Networked Government
- 46 **AFTERWORD**  
A Note to the Future

# FOREWORD

“The nicest thing about not planning is that failure comes as a complete surprise, and is not preceded by a period of worry and depression.”

John Preston

Singapore has never enjoyed the luxury of not planning for the future.

We were thrust into independence in 1965, a country smaller than New York City, with few natural resources and even fewer people who thought we would survive the initial years of nationhood. Our early leaders understood our tenuous situation and embarked on several long-term plans, including a massive industrialisation drive. Some of these efforts ran against the then-current conventional wisdom – opening our economy to international trade and multinational business rather than favouring import substitution being a key example. Planning is a deep part of our national DNA, drawing from what the late historian Michael Leifer described as Singapore’s acute awareness of its own vulnerability.

As Singapore matured, so too has our understanding that while we can plan and prepare for the future, we cannot predict it. Even the best-laid plans can run into problems, or even produce unintended consequences, in a world characterised by ever greater turbulence and complexity.

As John Preston suggests, one response to an uncertain world is to bury our heads in the sand and enjoy transient periods of blithe ignorance before being surprised by change. However, as a small state and economy, Singapore cannot afford this. As the velocity of change increases, such periods of comfort are likely to become progressively shorter. Singapore also has little strategic depth or capacity to absorb the consequences of multiple large policy errors.

Instead, we have opted for a system of governance that analyses and prepares for multiple futures. We acknowledge that we cannot fully anticipate these futures, but try nonetheless to understand their broad contours so that we can take steps today

in preparation for tomorrow. Effectively, we are involved daily in managing risk and uncertainty, and in building a system that is resilient to possible shocks.

This book outlines how our efforts at planning have evolved since the late 1980s, when we first experimented with scenario planning. Scenario planning continues to be a core tool in our arsenal, complemented by other methodologies and tools developed through the Risk Assessment and Horizon Scanning (RAHS) programme to form the “Scenario Planning Plus” (SP+) toolkit. The various efforts and experiments are synthesised by a team in our Centre for Strategic Futures (CSF), which was established in early 2009.

These efforts are not just marginal add-ons to Singapore’s pre-existing bureaucracy. They lie at the heart of how we are reinventing governance in the face of a rapidly changing global environment, which necessitates responses vastly different from what we have grown accustomed to. Traditional governance, what we might call “Government 1.0”, involved regulation, seeking compliance with policy rules and maintaining as efficient an approach as possible. In contrast, recent developments call for a fundamental rethink of traditional models. “Government 2.0” will need to be more adaptive, emergent and able to navigate situations characterised by multi-causality, ambiguity and complexity, where relationships between cause and effect are not always clear *ex ante*.

This is a story very much in the making. Our planning system will continually evolve as the global and domestic operating environments change. I am glad that the initial chapters of our story have been recorded here. Given our unique history and environment, we cannot promise universal solutions to the challenges and frustrations of planning in a complex world. But if we can offer suggestions that can be customised to other contexts, and educate Singaporean policymakers in the future, then this book will serve a useful purpose.

**Peter Ong**

Head of Civil Service, Singapore

Chairman, Centre for Strategic Futures Advisory Board



# INTRODUCTION

## Personal Reflections on Futures Thinking

In the 1980s, when I was Deputy Secretary in the Ministry of Defence, I wrote a paper suggesting that scenario planning as practised by Royal Dutch Shell could be a useful tool for planning and policy development. This eventually led to the introduction of scenario planning, first in the Ministry of Defence and then later by the rest of government.

Today, scenarios are a key part of the government's strategic planning process, embedded into our annual strategic planning and budget cycles. National-level scenario planning exercises are run every few years. These efforts deal with issues on a national scale, while focussed scenario studies on specific topics like the new media and climate change are also conducted regularly.

Scenario planning in Singapore has been useful in surfacing otherwise hidden assumptions and mental models about the world. Regular workshops and forums facilitate discussions amongst public sector leaders to build consensus and develop a Whole-of-Government strategic agenda. Planning units in our Ministries and agencies are now familiar with the key vocabulary and concepts of scenario planning. The language of scenarios – driving forces, critical uncertainties, predetermined elements and branching points – is now second nature to many policymakers who have been trained in the method.

In applying scenario planning, we were fortunate to learn from the experience of Peter Schwartz and others whose initial experience was in the Shell Scenarios team. We have since also worked closely with Schwartz and his associates at the Global Business Network (GBN), and for a long time were the only country among the GBN's otherwise corporate members.

Notwithstanding the benefits of scenario planning, a series of shocks in the late 1990s and early 2000s gave me an uneasy feeling about the methodology. These shocks included the Asian Financial Crisis in 1997, the terrorist attacks of September 11, 2001 and the SARS crisis in 2003. Each was a sharp, discontinuous and non-linear shock – a black swan – that had not been anticipated by the scenario planning



methodology, which tends to focus on linear extrapolations of driving forces as we currently perceive them.

Over several years, I realised that my apprehensions about scenario planning could be articulated through insights from complexity science and complexity theory. While the exact boundaries of the science of complexity are still being debated, it is clearly inter-disciplinary in scope. That is why some of our most vexing strategic problems require the insight and experiences of many agencies coming together, to develop coherent plans and policies in response.

Several analysts, including Dave Snowden, who previously headed IBM's Institute of Knowledge Management, divide phenomena into the simple, complicated, complex and chaotic. Snowden does this in what has come to be known as the "Cynefin<sup>1</sup> framework". Later in this book, details are provided on the valuable perspectives gleaned by the Singapore government from the Cynefin framework, but let me sketch out the broad strokes here. The framework provided a major insight and helped me realise that Singapore was no longer operating in the simple or complicated spaces, where cause and effect patterns are clearer and events more predictable. Instead, turn-of-the-century events like the Asian Financial Crisis, 9/11 and SARS had placed us squarely in the more complex and chaotic quadrants, where causal patterns are less discernible, and predictions much more difficult. Put another way, we were moving away from an "ordered" world to one that was more "unordered". Civil servants and government officials are often much more comfortable in ordered environments; our challenge was to start thinking about how to govern in more unordered, unpredictable circumstances.

As I thought more deeply about these issues, I gradually moved to the idea that we needed a horizon scanning initiative in Singapore, which could canvass a range of sources for weak signals of potential future shocks. This marked the beginning of the Risk Assessment and Horizon Scanning (RAHS) system, a computer-based suite of tools to aid scanning, modelling and perspective-sharing.

In the same way we learned from Shell, GBN and Dave Snowden, RAHS involved learning from a range of individuals.

---

<sup>1</sup> Pronounced "kuh-nev-in".

John Petersen, from The Arlington Institute, provided some inspiration with his models for data analysis. I discovered that John was also doing a lot of thinking about wildcards: low probability events with game-changing impact. This seemed to me an important complement to the traditional scenario analysis of driving forces. John later worked with our National Security Coordination Secretariat (NSCS) on pilot projects, which became part of the first version of the RAHS system.

We also learned from Jeff Jonas, who had done some impressive work in the field of complexity theory. His system of connecting databases and looking for outlier behaviour – through a system he called NORA (Non-Obvious Relationship Awareness – seemed like a rigorous way of detecting weak signals of future extraordinary events. We continue to engage Jeff regularly, to exchange perspectives and explore developments in our respective projects. He and John Poindexter, who developed a system of “Total Information Awareness” (TIA), both showed that it was possible to scan masses of data, both structured and unstructured, to look for weak signals, anomalies and emergent issues.

A brainstorming workshop held in 2004, involving these and other personalities, led to the conceptualisation and, ultimately, the development of the RAHS system. This story, of how we moved from scenario planning to RAHS, illustrates two important points.

First, the process was one of discovery and experimentation. There was no preconceived plan; we did not try to pre-judge or situate our approach *ex ante*. Given the nature of the issues we were tackling, we recognised that we could not start off thinking about our final destination, but were guided instead by synchronicity, serendipity and a bit of good luck.

Second, we were fortunate to have a reliable network of friends, from a range of disciplines and backgrounds, which helped us develop and implement our ideas, and continue to do so.

These two principles – experimentation and discovery, and the importance of networks – have been fundamental in the work of the Centre for Strategic Futures (CSF), which is the current phase in our strategic planning story. In this book, the CSF team shares some of the key lessons that Singapore has gleaned in the course of conducting experiments about the future, communicating insights to decision-makers, and continually learning from a wide network of friends.

**Peter Ho**

Senior Advisor, Centre for Strategic Futures

Former Head of Civil Service, Singapore

# CHAPTER 1 – A HISTORICAL OVERVIEW

“Our key challenge is to sustain good governance when the road ahead is unmarked.”

Peter Ho, 4th Strategic Perspectives Conference, 8 April 2008

## Singapore's Governance Model

Singapore is a small nation state of approximately five million people, including both citizens and resident non-citizens. With limited resources and no economic hinterland, it has always been dependent on the world economy for its survival. One of the cornerstones of its success story has been political stability and effective government. Its unique system of governance is based on core principles that form the basis of public policy formulation in the various spheres of government.

One of these principles is “Anticipate Change, Stay Relevant”. This principle recognises that Singapore must learn to anticipate future trends, influence developments and meet needs in ways that can provide Singapore with a competitive edge. Recognising that the future will always be uncertain, the PS21 (Public Service for the 21st Century) movement was launched in 1995 to transform the Public Service from being satisfied with the present to questioning the future. The basic tenet of PS21 is accepting the need for change as a permanent state. Scenario planning reflects the spirit of PS21, because it lies at the heart of anticipating change.

In line with the spirit of staying relevant, Singapore's model of governance has evolved over time: from “Reinventing Government” where government focussed on being lean, efficient and responsive; to “Networked Government” or “Whole-of-Government” thinking, where the importance of system-level outcomes was emphasised; and most recently to government as a “Complex Adaptive System” facing high incidences of systemic risks and uncertainties.

---

<sup>1</sup> The other three principles of governance are “leadership is key”, “reward for work; work for reward” and “a stake for everyone, opportunities for all”.

In 2005, the government embarked on a process known as **World•Singapore**, which applied Blue Ocean thinking – developed by Chan Kim and Renée Mauborgne – to generate new ideas and ways of thinking for Singapore. In line with its name, the movement aimed to bring Singapore to the world, and the world to Singapore, in order to seek out hitherto uncharted opportunities. **World•Singapore** was an important way to emphasise the importance of Whole-of-Government (WOG) thinking, and to anticipate the key complex issues that we will have to navigate in a more complex global environment. Through the work of 19 inter-agency project teams, each led by a Permanent Secretary, **World•Singapore** generated ideas about new things to do as well as new ways of doing things, by getting our officers to learn how to work in a networked fashion, rather than within the silos of their Ministries or agencies. In the process, it led to valuable political support and dedication of resources to accelerate progress on innovative ideas, and prompted public officers to make the link between their work and broader national strategies.

A common theme permeating all these governance models is the importance of strategic planning, in order to be prepared for the future. Due to its vulnerability to external events, Singapore's engagement in strategic foresight has been an important source of comparative advantage.

In a world that the Institute for the Future describes as increasingly volatile, uncertain, complex and ambiguous, several challenges face Singapore. Its status as a regional hub is being challenged by other emerging economies in the region. Energy security is a perennial worry, especially given recent instability in the Middle East. Singaporean society is also evolving due to

changes in our social makeup, greater affluence and changing expectations from an increasingly sophisticated citizenry. These factors make for a more variegated and multidimensional policy space, with issues such as a declining birth rate, an ageing population, tensions due to an influx of foreigners and increasingly vocal citizens calling for a more adaptive, flexible and responsive government.

**Due to its vulnerability to external events, Singapore's engagement in strategic foresight has been an important source of comparative advantage.**

Amidst these changes, Singapore has to be continuously forward-looking in order to tap on opportunities and highlight uncertainties, as it tackles the challenges of sustaining its growth.

## Origins of Scenario Planning in the Civil Service

Singapore's efforts at futures planning began as an experiment in the Ministry of Defence (MINDEF), in the late 1980s. This was a natural starting point, given that MINDEF's acquisition cycles are much longer than most public agencies' and involve looking 10-15 years into the future. A planning process was therefore needed that would allow them to look down such a long-term horizon.

Scenario studies were carried out in the Scenario Planning Branch, with security as their primary concern.

In 1991, the government felt that we should experiment with scenario planning as a tool for long-term strategic and policy development. Two years later, scenario planning was approved by the government as a tool for long-term policy and strategic development. Key initiatives that helped to jump-start the Civil Service's capabilities in scenario planning were its membership of the Global Business Network (GBN), as well as visits and attachments to the Shell Group Planning in London.

In 1995, the scenario planning functions were transferred from MINDEF to the Prime Minister's Office (PMO), where the Scenario Planning Office (SPO) was established. The office aimed to

- ▶ develop national scenarios;
- ▶ disseminate the scenarios;
- ▶ coordinate policy implications; and
- ▶ update expertise in the scenario planning methodology.

The newly-formed SPO launched its first set of scenarios in 1997. In the course of working on these scenarios, we discovered that while geopolitical and economic issues were well on the decision-makers' radar screens, softer "social" issues like national identity, rootedness to Singapore and community ties received less attention.

In response, the 1997 National Scenarios were designed to both be plausible and challenge decision-makers' current assumptions and worldviews. The scenario "Hotel Singapore" explored the possibility of a commercially successful, cosmopolitan Singapore to which few people felt connected, and where citizens were hardly different from hotel dwellers seeking somewhere to stay for short stints. "A Home Divided" posited a Singapore where identities were strong, in relation to specific community groups, but less to an overarching national self-image.

Subsequent exercises were conducted by SPO for the National Scenarios every three to five years, to refresh the thinking on possible futures and take into account changing realities and operating assumptions.

In addition to the National Scenarios, SPO has also worked with other agencies to conduct studies on more focussed topics. These are opportunities for “deeper dives” into issues identified as being of particular significance for Singapore. The greater focus on specific issues has also meant that agencies can apply the findings of each project more directly to their everyday work.

The two most recent focussed scenario projects have been on the following topics:

- ▶ New Media, which explored how the advent of the new media would introduce greater complexity into Singapore’s society and policy-making environment; and
- ▶ Climate Change, which examined how the first-order geophysical effects of global warming could lead to a range of second- and third-order effects, for instance on agriculture, human migration, geopolitics and international economic interactions among states, especially in the Asia-Pacific.

### **Benefits of Scenario Planning**

Scenario Planning has proved useful in creating a culture of long-term strategy planning and questioning assumptions and mental models, as it focuses as much on the *process* of strategic planning as a *product* or *outcome*, whether in the form of a report, research paper or some other deliverable. A typical scenario planning exercise is conducted by a group of public officers, from different agencies and with varying expertise, committed to the scenario planning project. Team composition is important to ensure diversity of opinion, expertise and experience. Each scenario planning team typically spends substantial time researching trends in the environment, otherwise known as driving forces, which could impact Singapore.

Each scenario project typically begins with an extensive interview process, through which the team seeks opinions on trends, changes and challenges from Ministers, Permanent Secretaries and other Public Sector Leaders. Personalities from outside government, who could provide fresh perspectives, are also interviewed. At key intervals, the driving forces and National Scenarios are presented to key decision-makers to obtain further views and feedback. This overall process helps to ensure



that the scenarios are useful not just as products, but also as a process to engender a common understanding of the future among government leaders.

Scenario Planning helps the Civil Service to re-examine conventional wisdom and formulate strategies to meet potential new challenges and opportunities. In 1997, the government approved the implementation of a formal “Scenarios to Strategy” process, which requires Ministries to conduct strategic reviews against the ideas set out in the National Scenarios.

**A typical scenario planning exercise is conducted by a group of public officers, from different agencies and with varying expertise, committed to the scenario planning project.**

### **A Broader Mission**

In 2003, the Scenario Planning Office was renamed the Strategic Policy Office, to reflect its enhanced work scope and responsibilities.

One of the first tasks of the newly-formed SPO was to drive the formation of cross-agency teams to coordinate strategy formulation at the WOG level. In essence, these teams were designed to provide concrete follow-up on the key issues identified in part by each set of National and focussed scenarios. Each team was set up to address a specific set of policy issues that required rationalisation across the jurisdictions of multiple Ministries and other agencies. These teams have typically been led by senior civil servants, and have comprised both experts from relevant policy realms, as well as officers covering other policy areas who could provide fresh and innovative perspectives. The teams have tackled a broad range of issues, including Singapore’s economic regulation framework, the situation faced by middle-income workers and the potential opportunities and challenges posed by today’s youth, who will be tomorrow’s consumers, talent and citizens.

To complement the work of the cross-agency teams, SPO started working closely with the Ministry of Finance towards a WOG strategic planning and budget allocation cycle. This was to ensure alignment between the budget planning and resource allocation processes on the one hand, and the strategy development process on the other.

The foundation of this merged system has been a “block budget” assigned to each Ministry – essentially a spending ceiling within which Ministries are empowered to make final allocations based on their respective strategic outcomes and priorities.

By design and necessity, the WOG planning process has been a fluid process, evolving since its inception to include more diverse tools as the challenges facing Singapore have grown in number, scope and depth. This WOG process takes into account the work done under the National Scenarios, as well as the Whole-of-Government Integrated Risk Management (WOG-IRM) framework, a complementary process that is elaborated on later.

### Limitations of Scenario Planning

*“Those working in government today are the first generation of public servants responsible for addressing difficult, complicated and a growing number of complex public policy issues simultaneously.”*

Jocelyne Bourgon, President Emeritus of the Canadian School of Public Service

Notwithstanding its many uses and applications, after several iterations, scenario planning proved to lack sufficient agility in responding to a rapidly changing and complex environment.

Part of this stemmed from its focus on linear extrapolations of trends or driving forces as currently perceived, which discounts the possibility of sharp, discontinuous shocks.

Also, a typical National Scenarios exercise would take approximately two years, during which there was little avenue for quick updates, “course corrections” or opportunistic refreshes based on current developments. A succession of unanticipated events – including the 1997 Asian Financial Crisis; Jemaah Islamiah terrorism-related arrests in 2002; and the occurrence of Severe Acute Respiratory Syndrome (SARS) in 2003 – indicated that the Singapore government needed to manage future risks and uncertainties with a broader suite of tools that could canvass new tools and ideas, to analyse weak signals of potential future shocks.

## Developing New Tools

In response, the Civil Service began exploring risk assessment and horizon scanning capabilities in trying to understand a more complex and unpredictable environment. There was a broad understanding that even with the best efforts and best tools, we would still be surprised – possibly and probably repeatedly. Hence, the aim of these new capabilities was not to eliminate, but to reduce the frequency and amplitude of strategic shocks.

As Peter Ho noted in his Introduction, the search for tools to complement scenarios drew on the work of various international experts in complexity and futures.

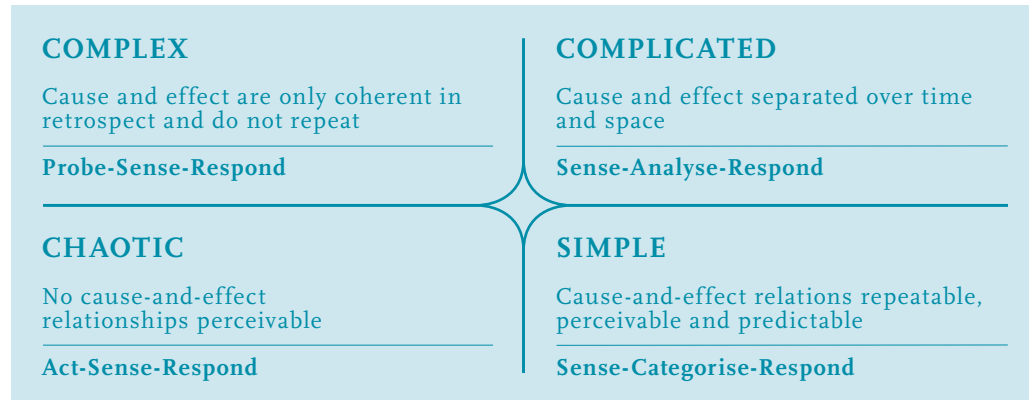
John Petersen, president of The Arlington Institute, had written about strategic surprises and developed the Arlington Index, to measure the rate of change and impact of wild cards. Petersen proposed setting up a Surprise Anticipation Centre – an idea that eventually evolved into the Horizon Scanning Centre (HSC) as part of the Risk Assessment and Horizon Scanning (RAHS) programme, under the National Security Coordination Secretariat (NSCS).

Jeff Jonas, Chief Scientist of IBM's Entity Analytics Group, had done impressive work in the field of complexity theory and developed NORA (Non-Obvious Relationship Analysis), a system that connected databases and scanned for anomalous behaviour.

John Poindexter was heading DARPA's (Defense Advanced Research Projects Agency) Total Information Awareness Office in 2002. The Total Information Awareness (TIA) concept posited that by connecting a vast number of databases, we could find weak signals and emergent issues, and this inspired us to consider the necessity of having large-scale search capabilities to detect new challenges.

Dave Snowden, founder of Cognitive Edge and an expert in sense-making and complexity, provided a key insight with his Cynefin framework, depicted below. Playing on the meaning of the Welsh word Cynefin, "place of multiple belongings", the framework divides the operating environment into Simple, Complicated, Complex and Chaotic spaces. Governments tend to think that they are operating in the known or knowable quadrant, where events and cause-effect relationships are predictable *ex ante*. However, governance has been increasingly taking place in an environment that is best represented by the unordered realms, on the left side of the diagram. These are characterised by increasing complexity and even chaos,

where the first to discern patterns would have a competitive advantage. In such an environment, the linear planning processes of governments may often be inadequate and out of synchronisation.



Several analysts have noted that scenario planning is usually best applied when the environment lies in the simple and complicated spaces, where cause and effect patterns are clearer and events more predictable. However, events such as 9/11, the JI arrests and SARS indicate that events increasingly occur in the complex and chaotic spaces, where patterns are less discernible and forecasts are more difficult. As noted by Snowden:

*“(A fundamental assumption is) that a certain level of predictability and order exists in the world. This assumption encourages simplifications that are useful in ordered circumstances. Circumstances change, however, and as they become more complex, the simplifications can fail.”*

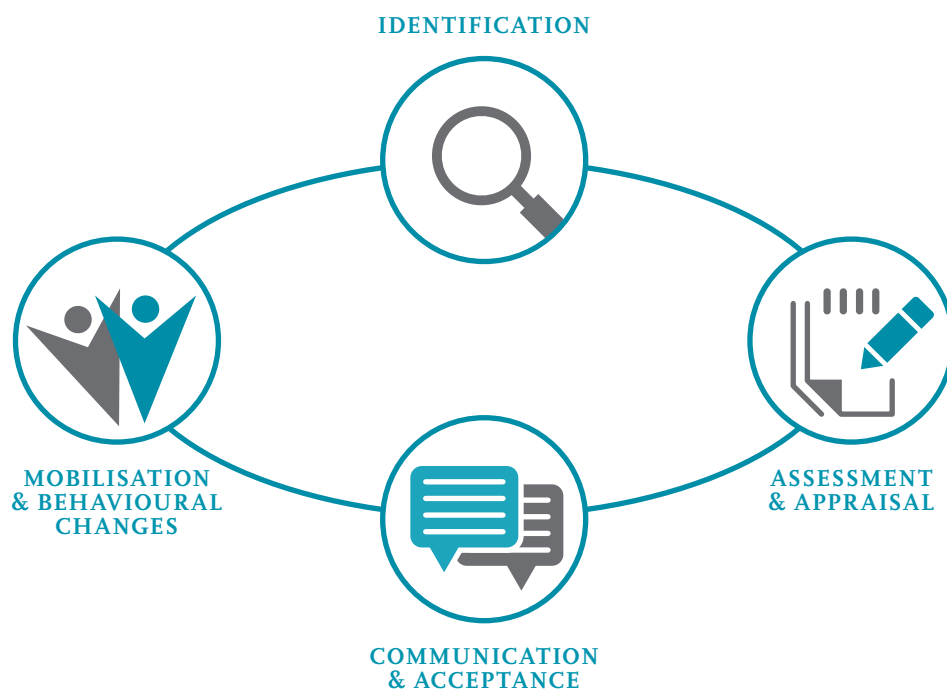
To begin tackling the challenges posed by greater complexity and the prospect of discontinuous change, the RAHS programme was launched in 2004, as part of the NSCS. The RAHS programme explores methods and tools that could complement scenario planning in anticipating strategic issues with significant possible impact on Singapore.

Peter Ho notes in his Introduction that Singapore's strategic planning journey has been one of experimentation and discovery. This echoes an earlier remark he made at a gathering of the RAHS network, that there was no master plan for the formation of RAHS; instead, it was "a journey of discovery... It will evolve over time, with new concepts, models and technologies." This is in line with recent work by Gary Klein, an organisational theorist who argues that complex issues are best dealt with through "Management by Discovery", rather than "Management by Objectives".

**Events increasingly occur in the complex and chaotic spaces, where patterns are less discernible and forecasts are more difficult.**

### Whole-of-Government Integrated Risk Management (WOG-IRM)

Recognising that even under conditions of uncertainty and complexity, governments must continue to make plans and take decisions, a WOG-IRM framework was developed in 2004 to identify risks which could have an impact on our strategic outcomes. The framework comprises a process to identify, analyse and manage risks:



This framework expanded on a similar effort, started in MINDEF, to examine security risks. MINDEF developed its prototype Enterprise Risk Management system from scratch, adapting components from the private sector where appropriate, as there was no suitable equivalent framework in any other government.

Unlike MINDEF, the government-wide process covered a much wider range of issues and generated what some senior decision-makers described as an incomprehensible “spaghetti bowl” of inter-connected risk issues. Therefore, rather than considering agency-level risks, subsequent iterations have focussed on strategic risks with potentially deep and cross-domain impact on national survival and interests, rendering their results more tractable and useful.

Finally, WOG-IRM is integrated with the WOG planning process so that the risks and opportunities identified also receive the resources necessary to address them.

## **Experimentation and Networks: the Centre for Strategic Futures (CSF)**

### **Origins of CSF**

With RAHS and WOG-IRM as complements to scenario planning, a key remaining challenge was how the Public Service could organise and manage in a fast-changing and uncertain environment.

Initial ideas for a “Centre for Strategic Anticipation” were incubated within the National Security Coordination Centre (NSCC), part of the Prime Minister’s Office, in December 2008. The Centre aimed to develop government-wide capabilities in strategic anticipation, by synthesising the various work-strands in scenarios, RAHS and WOG-IRM. The Centre was eventually established as the “Centre for Strategic Futures” in early 2009, as part of SPO in the Public Service Division (PSD) of the Prime Minister’s Office. This situates it at the heart of government, with the ability to reach across agency stovepipes. It draws regularly upon the existing networks and analyses in SPO, as well as PSD’s other functions in human resource, leadership development and organisational excellence.

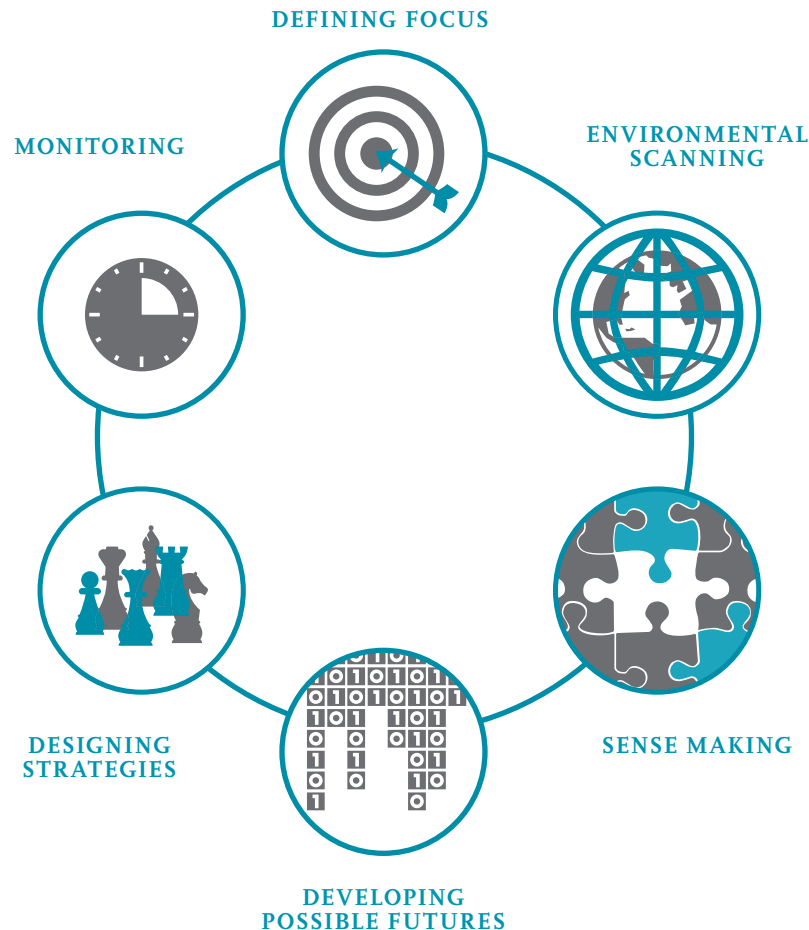
At the same time, the Centre operates very much like a think tank within government, with the freedom to act on issues of strategic importance even if they are not perceived to be immediately urgent. This has led to a delicate mixing of functions, with the Centre functioning both within and outside traditional bureaucratic structures. To use a phrase adopted by the similarly-oriented Shell scenarios team, the CSF is

“tolerated but not embraced” by the rest of the government – a necessary balance to achieve its unique role.

One of the Centre’s first efforts was to update the existing scenario planning process, to complement it with a range of additional tools. The updated process was thus named “Scenario Planning Plus (SP+)” and incorporated scenario planning, which continues to be useful, as well as a range of other tools for the six key purposes outlined below:

## How We Do It

### METHODOLOGY





### CSF Structures and Processes

The CSF's vision is to build a strategically agile Public Service ready to manage a complex and fast-changing environment. Led by the Director of SPO and a centre Head, it also receives guidance from an Advisory Board comprising Permanent Secretaries and other senior civil servants. The CSF also taps on a wide international network of advisors and friends, who provide guidance and new ideas.

As part of its think tank-like functions, the key roles of the CSF are to:

- ▶ Promote a collective instinct for strategic thinking at the WOG level
- ▶ Develop and promote the use of tools and methodologies for strategic thinking and risk management throughout the government
- ▶ Be the focal point for cultivating networks between local government agencies and international partners to promote an active exchange of ideas
- ▶ Challenge conformist thinking
- ▶ Develop links with academia to support the development of inter-disciplinary research work in areas like complexity studies and risk management

### Emerging Strategic Issues and Wildcards

The CSF's research and analysis synthesises across the national scenarios, WOG-IRM and a new programme called "Emerging Strategic Issues and Wildcards" (ESI).

The ESI project involves identifying, filtering and prioritising strategic issues which have not yet surfaced as critical but could have significant impact if they occur – sometimes referred to as “unknown unknowns”. The process involves generating a diversity of ideas based on research, as well as interviews and online conversations with a range of personalities from the public, private, people and academic sectors. Canvassing views from outside of government, and internationally, is a deliberate strategy to tap on the “wisdom of crowds”, avoid groupthink within government and obtain fresh insights. This is in line with the best practice of others in the business of futures and foresight.

**The CSF's vision is to build a strategically agile Public Service ready to manage a complex and fast-changing environment.**

In their current iteration, the ESIs have been prioritised through voting by a group of senior public sector leaders. These public sector leaders were asked to rank the issues based on three criteria:

- ▶ impact on Singapore;
- ▶ likelihood of occurrence; and
- ▶ the level of institutional surprise each issue would cause if it occurred (i.e. how public sector agencies would be caught off-guard despite current safeguards).

There is also a conscious effort to monitor issues that were not prioritised in the voting process, as these could be part of current organisational blindspots and prove critical in the future.

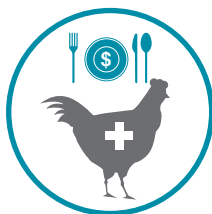
The issues currently being analysed at the CSF draw on this shortlist of ESIs, and include:

### Examples of Emerging Strategic Issues

#### ENERGY, FOOD AND WATER



RESOURCE  
CONFLICTS



FOOD PANDEMICS  
AND PRICE SHOCKS



ENERGY CRISIS

#### EFFECTS OF TECHNOLOGY



CYBER-  
TERRORISM



HUMAN  
AUGMENTATION

ESIs are monitored in a variety of ways. If topics are clearly owned by specific government agencies or groups of agencies, the CSF works directly with them or establishes inter-agency teams to deal with these areas.

The RAHS suite of tools is also used to scan widely for ongoing developments in the ESIs, while international visits and networking allow the CSF to get a sense of ongoing and emerging global trends in relation to the ESIs. Taken together, these efforts enable the CSF and its partner agencies to obtain a good sense of recent developments in the issues, so that they can be resurfaced to policy makers at appropriate times.

## CHAPTER 2 – COMPLEXITY, COGNITION AND THE CHALLENGE OF COMMUNICATION

“...to design scenarios that would lead our decision-makers to question their inner model of reality and change it as necessary, in order to take action...”

Pierre Wack, “Scenarios: The Gentle Art of Re-Perceiving”

“The real voyage of discovery consists not in seeking new lands, but in seeing with new eyes.”

Marcel Proust

The newly-inducted into Singapore’s futures community often ask: Why, despite top-level sponsorship, support from the public sector leadership and years of scenario planning workshops, are we still not fully adept in anticipating the future through scenarios and new tools like RAHS and SP+?

Over the years, the experience of scenario planning, RAHS and the CSF has suggested that the answer has less to do with the perceived limitations of the methods themselves, and more with

- ▶ the nature of human cognition;
- ▶ our inability to make sense of complexity; and
- ▶ poor or missing incentives to prepare for strategic surprises.

This chapter elaborates on each.

### Cognitive Failures

The most difficult problems involve cognitive failures to anticipate and prepare for the future. Many surprises that governments have to deal with – natural disasters,

pandemics, even financial crises and political upheavals – can often be assigned probabilities. If not, they can be anticipated through the “stories” or “narratives” that scenario planners and other futurists use.

Arguably, these scenarios should lead governments to take precautionary measures, but there are several reasons why this fails to happen.

### **Hyperbolic Discounting**

First, policymakers often have a hard time properly discounting the present value of events that will take place in the future. This cognitive bias, or heuristic, is known among behavioural economists as present-biased preferences or hyperbolic discounting. This is the tendency to discount *future* risks and contingencies excessively and instead to place too much weight on *present* costs and benefits.

Policymakers are not cognitively well-disposed to making these calculations; the institutional roles they occupy often discourage them from spending time worrying about a problem that will occur only after they leave office. Democratic governments in many parts of the world are often paralysed in the face of problems whose consequences are felt only in the distant future – such as ensuring the solvency of social security systems and reforming healthcare. In the words of Richard Thaler and Cass Sunstein from the University of Chicago, who wrote the influential book *Nudge*, ours are not the actions of hyper-rational beings that they call “Econs”. Instead, we have the bounded rationality and imperfect information of mere “Humans”.

### **Confirmation Bias**

Governments are also prone to another cognitive limitation – confirmation or consistency bias: the tendency to pay attention only to those things that are consistent with, or confirm, our existing mental models. For example, during the boom years before the current global economic crisis, most people – even among experts – were dismissive of the risks of a major financial or economic meltdown. Central bankers thought that they had mastered macroeconomic management to the extent that prolonged inflation and deep recessions were no longer possible. Financial sector experts, including those at the International Monetary Fund (IMF), believed that financial innovation, especially in the form of securitisation, had diversified risks and made the global financial system less prone to catastrophic collapses. Those

who foresaw an impending crisis – like Nouriel Roubini and Nicholas Nassim Taleb – were roundly ignored.

Much of our reluctance to grapple with game-changing issues such as the financial crisis stems from an unwillingness to face the consequences of taking different scenarios or alternative futures seriously. These consequences interfere with long-held mental or business models, or self-interest, to create cognitive dissonance. This interference is uncomfortable, so the human mind

**At the heart of it, cognitive dissonance is about denial: the inability to acknowledge uncertainty and unwillingness to accept the need to adapt to a future that might be radically different from current reality.**

responds by rejecting or ignoring these alternative scenarios. At the heart of it, cognitive dissonance is about denial: the inability to acknowledge uncertainty and unwillingness to accept the need to adapt to a future that might be radically different from current reality.

Richard Nisbett, in his book *The Geography of Thought: How Asians and Westerners Think*, takes this argument even further and suggests that some of our biases and cognitive dissonances are culturally-based. For instance, Westerners from countries like the US, UK and Europe tend to see the world in terms of individuals who are linked to others, and the surrounding environment, in axiomatic ways. From this emerges the emphasis placed in the West on individual rights and the rule of law.

In contrast, East Asians – Nisbett refers primarily to the Sinic cultures here – tend to see individuals, communities and their environments interacting more organically, as holistic and dynamic ecosystems.

While neither approach is necessarily the right one, relying solely on either limits our ability to perceive problems from multiple angles. Extrapolating from this, it is not difficult to see why one of the big challenges of government is the impediment that bureaucratic silos pose to the sharing of insights and information critical to thinking about the future. Information and coordination in such silos flow vertically, rather than develop horizontally.

### Countering Cognitive Biases

A key function of Singapore's strategic planning is to consider how we can limit or counter the influence of such biases. Obviously, the actual occurrence of a crisis that radically alters our mental models is one corrective. The SARS crisis forced governments in China, Hong Kong and Singapore to take more deliberate steps to prepare for future pandemics. SARS corrected our confirmation biases, made us realise the severe risks and costs of a pandemic, and increased our alertness to the onset of another pandemic. Without SARS, Singapore's response to the more recent AH1N1 outbreak would not have been as aggressive and proactive. Our response, and that of other Asian governments such as China and Hong Kong, contrasted quite starkly with the lack of urgency in other countries, which had been largely unaffected by SARS. This is not at all surprising, since confirmation biases can contribute to governments avoiding extreme actions when presented with unfamiliar situations.

While crises can break our outdated mental models, they are an expensive way to force recognition of our confirmation biases. No government or society should have to wait for an actual terrorist attack to take the threat of terrorism seriously.

In addition, the research conducted at SPO and the CSF has highlighted that we sometimes learn the wrong lessons from crises. After the Asian Financial Crisis, Asian governments built up their foreign exchange reserves as a form of insurance against the next currency crisis – but this was not necessarily the right lesson of the

Asian crisis. The crisis was not caused by insufficient foreign exchange reserves in the Asian economies (although not having enough reserves limited their ability to deal with the crisis). Instead, current thinking suggests that it was the result of moral hazard stemming from semi-pegged exchange rates that created a false sense of security for domestic institutions to borrow heavily in foreign currency, weaknesses in regulatory regimes, and poor corporate governance. Even this reasoning may one day be proven mistaken, or at least incomplete, based on future insights.

**While crises can break our outdated mental models, they are an expensive way to force recognition of our confirmation biases.**

A major question that Singapore's strategic planners have pondered is how we can prepare for the future, if crises are not the best way to correct for our consistency biases. The various National and focussed scenarios have suggested that part of the answer lies in producing well-crafted, challenging narratives of the future,



articulating imaginative yet plausible ways in which current trends could evolve. For instance, the Climate Change Scenarios explored different permutations of political, economic, scientific and other consequences from different degrees of global warming. Such narratives can also take the form of Emerging Issues or even an “artefact from the future” like the simulated newspaper below, which was disseminated to all government planning units on the first work day of 2011, to encourage some consideration of possibilities in 2012.

THE

MICA (P) 2/1/2012

MONDAY, JANUARY 2 2012

A FUTURE PRESS HOLDINGS PUBLICATION

ESTABLISHED 1845

95 CENTS

# FUTURE TIMES

facebook

Search

Home Profile Account

Singapore Police Force GPF Facebook has exceeded the 40,000 mark! We wish to say a big Thank You to our fans for their active participation this side forward to your continued support in the new year ahead. We hope in spreading our crime prevention & public education messages! To all our fans, Happy Facebooking & Happy New Year!! ~~~~~

Wall Info Contact Us Photos Public Friends Advertisements 30

70 percent of Singaporeans have Facebook accounts  
IN LIFE!

Rubble, rubble, toil and trouble  
China's inflation woes

IN WORLD

SGX-ASX merger stalls  
due to disagreement  
over terms

CANBERRA: The bill required to allow foreign investors to own more than 15 percent of the Australian Securities Exchange (ASX) was defeated by three votes as independents broke rank with the Labour Party, citing the need to renegotiate the terms of the merger in order to protect Australia's interests.

■ PRIME PAGE A3

Floods, droughts and  
disease: triple  
whammy triples world  
food prices

NTUC implemented purchase quotas yesterday on rice, wheat, and corn.

The price of rice and many other substitutes has tripled with crop failures in Thailand, Vietnam and China due to severe weather.

■ PRIME PAGE A5

Engineers to examine  
soil conditions of re-  
claimed land in Marina  
Bay area

BUILDING cracks appeared in multiple locations at Marina Bay Sands after strong tremors were felt island-wide from a magnitude-8.7 earthquake off Sumatra. Inspectors from the Building and Construction Authority (BCA) are on-site to examine the safety of buildings in the Marina Bay area.

■ PRIME PAGE A17

Ayatollah Khomeini  
“gravely ill”

TEHRAN: Iran's Grand Ayatollah Khomeini, reported by Wikileaks.com to be suffering from end-stage leukemia, was rushed to Tehran's largest hospital for treatment after collapsing on Saturday night. Internal tensions rise as speculation mounts on who will succeed him.

## New restrictions on housing markets

Non-citizens restricted to one property per buyer

By SHARON WOO

HOUSING CORRESPONDENT

AMID record housing prices, the Ministry of National Development (MND) yesterday announced further measures to cool the property market for both private housing and HDB resale flats. Key amongst the new measures - all non-citizens will be restricted to the purchase of only one property per person.

The new measures were announced in a press conference yesterday. “In light of the continued rise

in prices for both the private housing and HDB resale flat markets, we believed there was room for the Government to intervene to temper the growth in housing prices,” the spokesman for MND said.

“The Government wants to prevent the local housing bubble from imploding. This is the right move at the right time,” said Mr Dennis Wee, Managing Director of the Dennis Wee

Group. “In the past few years, we have seen housing markets collapse with wide-ranging, long-lasting economic effects worldwide,” he added.

The new measures include a stamp duty on all residential properties and land sold, a lowered loan-to-value limit of 50 percent for housing loans on the second property and above, increased downpayment on

CONTINUED  
ON PAGE A2

## “Bipartisan bankruptcy”

THE U.S. unemployment rate reported yesterday was at a 50-year high of 12.2%. “This comes as no surprise to us,” says Deshawna Williams, coordinator of a homeless shelter in Detroit. “We have had to turn away entire families on their homes after losing their jobs, or cannot afford to heat their homes,” she added.

“Refundate bipartisan bankruptcy” was the theme of a Tea Party conference chaired by Sarah Palin, former Governor

See PRIME PAGE A12.

## German opposition calls for Eurozone pullout

Investor confidence declines to record lows

By ELVIN ONG

POLITICAL CORRESPONDENT

ON fears of rapidly declining investor confidence, German opposition parties yesterday issued a combined statement to call for Germany to pull out of the Eurozone. Correspondingly, they suggested that German Central Bank re-instate the Deutschmark from 1 July 2012.

Market watchers say that such a pull-out is within expectations, espe-

Spain in 2011. “This pullout is going to happen sooner or later. Most Germans are actually very worried after Portugal and Spain went down earlier this year. The opposition are just doing their job,” said Jack Muller, Chairman and CEO of hedge fund, Muller Investments.

The proposed re-instated Deutschmark will serve as the new

ests of the German people,” said the Frank-Walter Steinmeier, leader of the Social Democratic Party of Germany, in a press conference in Munich at noon yesterday.

Beleaguered German Chancellor Angela Merkel responded, “We are very disappointed at recent populist moves by the opposition. We continue to trust in the strength of the Euro

### The Challenge of Complexity

Through several scenario exercises since the late 1980s, Singapore's strategic planners have realised that a second source of failure to prepare adequately for surprises arises from our limited grasp of complexity. Despite our best efforts, many practitioners tend to focus on what can be modelled or extrapolated from today's trends. What is not modelled is discounted or assumed away. As a result, planners in practice, if not in theory, often end up concentrating on "known unknowns" rather than on "unknown unknowns".

Related to this is an inherent linearity in our causal reasoning. Since the scientific revolution of the 18th century, the Cartesian assumption has grown more ubiquitous: there is proportionality between cause and effect; big causes will have big consequences and small causes, small consequences. This linearity, applied to planning for the future, can easily mean that practitioners focus on the major forces in the social, economical, technological, political and environmental spheres. But some future states of the world are difficult to anticipate because they emerge out of parallel developments whose interactions are either unforeseeable or unforeseen by planners. High-tech gurus often confidently predict the "next big thing" on the basis of straight-line guesses or extensions of existing trends. But history has shown us that the way future technologies will interact with each other and with users is an emergent property, not always predictable from previous developments.

Non-linearity and emergence have had major implications for how Singapore has gone about developing its ability to anticipate future change. We are constantly grappling with the reality that our society and economy are complex systems, unlike machines governed by stable causal relationships. We cannot predict the future by identifying all the known driving forces, and then generating scenarios from them by mechanically "computing" interaction effects. Even if it were possible to identify all the relevant driving forces, the sheer number of interactions among them would produce a dizzying array of possible outcomes – more than can be described in a few scenarios.

Instead, we have tried to learn the lesson that futures thinking should not be reduced to a simplistic engineering procedure in which driving forces are the inputs and scenarios or future narratives, the outputs. Instead, it is more like building an ecosystem. Driving forces are the raw ingredients that interact in sometimes bewildering ways, invariably producing outcomes and patterns that are unpredictable *ex ante*.

The experience of the ongoing financial crisis is instructive in providing us with a glimpse of the inherent uncertainty and unpredictability of complex systems. The relevant driving forces were known before the crisis – structural imbalances in the global economy, financial sector innovation, especially in the form of securitization, and the globalization of capital markets. Yet it would have taken extraordinary imagination to identify a major financial and economic crisis as a potential scenario simply based on these underlying drivers.

Learning from the ongoing crisis, we now acknowledge the need to understand a range of variables and factors. These include the complex linkages and interactions between sub-prime mortgage originators, banks and non-bank financial institutions, the shadow banking system, credit rating agencies and insurance companies, as well as the underlying human behaviour and greed of all the actors within the financial markets, in the broader context of global imbalances and low interest rates in the US. Only then can we begin to understand the risks of a severe financial crisis.

Of course, hindsight will always cast decision-makers in a less than favourable light. There has not been a single, proven method for singling out “unknown unknowns”, but that does not imply that governments should apply rigid “business-as-usual” approaches either. Instead, we have realised that in addition to the traditional emphasis on driving forces in the scenario planning methodology, we must also identify potential discontinuities, monitor for emergence, and scan the horizon for “wild cards” and “black swans”. This was a major motivation for our ongoing efforts with RAHS and the ESI project.

**There has not been a single, proven method for singling out “unknown unknowns”, but that does not imply that governments should apply rigid “business-as-usual” approaches either.**

### **Poor or Missing Incentives**

The final obstacle to properly guarding against strategic surprises has to do with poor or missing incentives. Even if individuals and organisations are cognitively prepared for a contingency, they often do not have the right incentives to hedge against it. For instance, even if we had identified in our scenarios the possible risk of a severe financial crisis, would we have taken precautions or done anything differently? Hedging is costly,

and risks – as the ongoing global financial crisis shows – spill across boundaries in ways that make it impossible for a single country to hedge against fully.

As a result, it is not always easy for the strategic planner to challenge an official vision of the future, especially when that future is consistent with an organisation's biases and preconceptions. The planner who articulates a radically different future is in danger of being branded as subversive or lacking a sense of reality. He has a real incentive to make his scenarios more palatable for his audiences.

But in so doing, he also inadvertently reduces the impetus for the organisation to confront its uncomfortable futures and to prepare itself for them. That is why Peter Schwartz once said that the futures planner should be a court jester: he can say the most ridiculous things and get away with it. The planner's role is to help decision-makers suspend disbelief.

### **Lessons Learned at the CSF**

It would be easy to grow despondent – fatalistic even – about the possibility of doing strategic planning well. But the work of thinking about the future is far too important to succumb to fatalism.

Over the years, Singapore's future planners have grown more or less accustomed to the reality that thinking about the future and strategic surprises will remain a messy business, where people often pursue the wrong aim of trying to get precise predictions.

Early pioneers of scenario planning, like Pierre Wack and Peter Schwartz, acknowledged that when thinking about scenarios, one should focus less on the external world and more on the internal world of the decision-maker. This does not mean we ignore external factors, but their relevance should be measured against an organisation's priorities. As Schwartz notes, "the objective is not to get a more accurate picture of the world around us". Rather, we should seek to provide useful input for our decision-makers to make informed assessments. Good scenarios must provide better decisions, not better predictions.

The CSF team is constantly asking: How then can we make better decisions about anticipating strategic surprises? In the rest of this chapter, we outline five key ideas.

First, we need to acknowledge and accept that human cognition has its limitations in anticipating strategic surprises. Even in the most forward-looking government, leaders and officials will have their own mental models and cognitive biases. We all seek confirmation for such biases. Being aware of them is already a step forward in anticipating the future. When Singapore started scenario planning nearly two decades ago, we were not as sensitised to

cognitive biases as we are today. Knowing what we know today, we can take deliberate compensatory steps. Through travel and exposure to new ideas, we can cultivate an open mind, encourage a range of perspectives that do not conform to our own mental models, and challenge our thinking with contrarian and diverse views. This does not mean we must agree with every view; but we do our best to give each a hearing, to test the robustness of our own ideas.

**Through travel and exposure to new ideas, we can cultivate an open mind, encourage a range of perspectives that do not conform to our own mental models, and challenge our thinking with contrarian and diverse views.**

Second, we strive to recognise that the cost of responding to some strategic surprises can be too high, especially when governments are seen as spending inordinate resources to prepare for eventualities that may never happen. For instance, there is a possibility of the earth being destroyed by a planet-killing asteroid, but this is probably not a risk that we can meaningfully prepare for given the prohibitive costs today. We cannot eliminate every risk, but we need to manage each in such a way that strategies and their premiums do not have to be front-loaded.

Third, we have to calibrate strategic thinking processes around the psychological and practical challenges of policy implementation. In addressing these “downstream” issues, methods matter, but psychology matters too. For Singapore’s case, the evolving SP+ framework will continue to reflect the relative strengths of the scenario planning and RAHS processes in mitigating issues of cognitive failures among our key audiences.

The role of psychology is linked to a fourth lesson: the importance of engaging and communicating with decision-makers. Their support and active involvement are crucial for success in achieving better decisions and strategic outcomes. For a message to resonate strongly with decision-makers, the work should be presented in distilled forms, with sufficient detail, using creative expressions and graphics like the simulated newspaper headlines above. In futures workshops, we have also experimented with



the use of graphic facilitation in order to distil complex ideas in catchy, memorable ways. The example below is from a workshop discussing the future of Asia.



In addition, complex scenarios and strategies can be broken down into smaller “bite-sized” pieces. These are more easily digested by decision-makers, who, in turn, have a higher likelihood of recalling and applying these insights. At workshops involving senior civil servants, written reports of future trends are often complemented with “memory cards” like the one below, which capture the essential ideas.

“Having lost our competitive advantage, we’re stuck playing catch-up.”



Soh Ding Wei, 37  
Strategic Planner

The expansion of high-speed rail linkages cutting across continental Southeast Asia has diminished Singapore’s relevance as a hub for business and talent – a point made worse by skyrocketing oil prices, which have reduced long-range sea trade. Officers like Ding Wei often find themselves at a loss:

**WHAT IS OUR VALUE PROPOSITION BEYOND OUR HUB STATUS?**

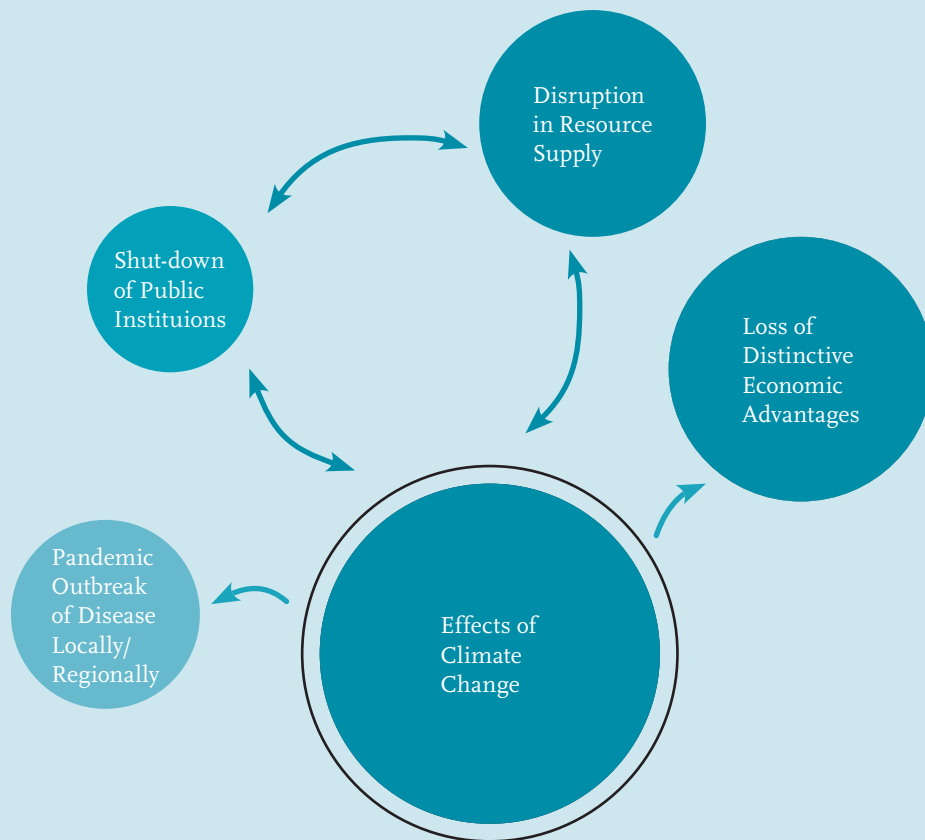
In a similar vein, the findings of the WOG-IRM process are conveyed through a combination of written reports and more succinct “risk cards”, like the one below:

## PHYSICAL DISASTERS AND HAZARDS

### Risk Event: Effects of Climate Change

#### WEATHER CRISES ARISING FROM CLIMATE CHANGE

- ▶ The following outcomes could damage Singapore’s liveability and reputation as a clean and green city
  - Intense rainfall – flooding with loss of land/life
  - Extreme temperatures exacerbating haze and disease outbreak
  - Sea-level rise could lead to loss of land and threaten fresh-water reservoirs
- ▶ Increased energy demand, e.g. for air-conditioning, may increase resource vulnerability

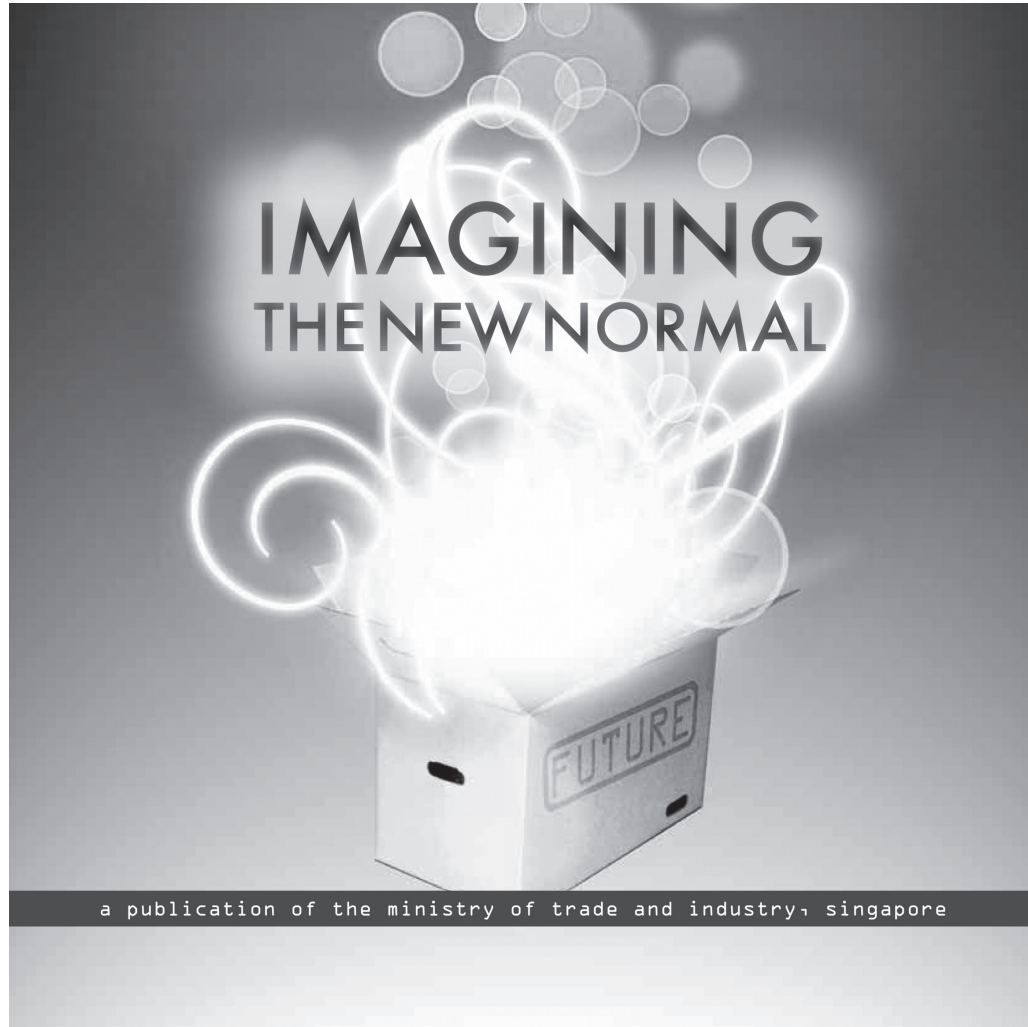


N.B: The size of the circles represents the extent of the respective risk events.



The CSF's counterpart units in other Ministries have also undertaken innovative communications experiments. The diagram below is the cover of a recent publication by the Ministry of Trade and Industry's Futures Group, which explores key economic issues in a range of ways, including videos on emerging trends and a *manga* comic on geo-engineering.

---



Some of our current experiments with communications involve engaging decision-makers through exercises and what we now call “policy games”. These help decision-makers get into the habit of preparing for the unexpected. Gary Klein, in his book *Sources of Power: How People Make Decisions*, emphasises the importance of identifying patterns in perceiving and making decisions about the future. Expertise in handling specific situations can be developed through repeated experience and pattern identification. Participation in exercises and games help simulate some of these real-life patterns, which can then be applied to decision-making in exceptional situations.

The military exemplifies this approach, as war is characterised more often than not by surprise rather than predictability. They prepare for these inevitable surprises through wargames, conducted repeatedly under different conditions, so that military planners and leaders are mentally conditioned to expect and prepare for surprise.

Other futures practitioners are also increasingly applying gaming techniques – Jane McGonigal at the Institute for the Future, for instance, as well as the Netherlands-based Stichting Toekomstbeeld der Techniek. In 2010, the CSF worked with our Ministry of Manpower to develop a policy game that was applied to the issues of labour relations and human capital development.

Fifth, the CSF increasingly recognises that even as we endeavour to avoid being surprised, we should still expect to be surprised. To mitigate this, governments should build some “fat” into their organisations by having a small but sufficient group of people to think about the future. These individuals will be the repository of patterns that can be used to facilitate decision-making, especially to prepare for “unknown unknowns”. It is critical that such groups are given the freedom and bandwidth to focus on this important role without getting bogged down in day-to-day routines. A corollary to this point is that lean and efficient governments may not have the spare capacity to deal with shocks to the system. As Singapore has done with the CSF, it is very likely that governments in the future will have to find ways to create some spare capacity to cope with unexpected contingencies. It will also be necessary to build organisations staffed by curious people with inter-disciplinary minds who can see connections across disparate issues and areas of study.

**It is critical that such groups are given the freedom and bandwidth to focus on this important role without getting bogged down in day-to-day routines.**

Dealing with complexity and cognition is a new area for the Singapore government. While it has not been a traditional area of focus for most governments, it would be a mistake to overlook it. The underlying science of complexity indicates that it is multi-disciplinary in nature. This resonates closely with the Singapore government's approach in dealing with strategic WOG issues, in complex or chaotic environments, that require inter-ministry and inter-disciplinary collaboration. We are still in the midst of exploring how these challenges can be attenuated, even if not overcome, and hope to share more experiences of further attempts to do so in future volumes of this book.

## CHAPTER 3 – CAPABILITY-BUILDING

### FutureCraft

Given the complexity and cognitive issues outlined in the previous chapter, a key role for the CSF has been to promulgate the SP+ framework of tools for strategic thinking and risk management throughout the government. In essence, this has involved training government officers in the tradecraft of the futurist, which we have done through a series of workshops called “FutureCraft”.

The FutureCraft curriculum was designed to complement existing Scenario Planning Workshops (SPW), which have been conducted by SPO since the early 1990s, as well Environmental Scanning Workshops (ESW) conducted by the HSC to increase awareness and application of RAHS tools. The SPW sessions have been rebranded as “FutureCraft 101”.



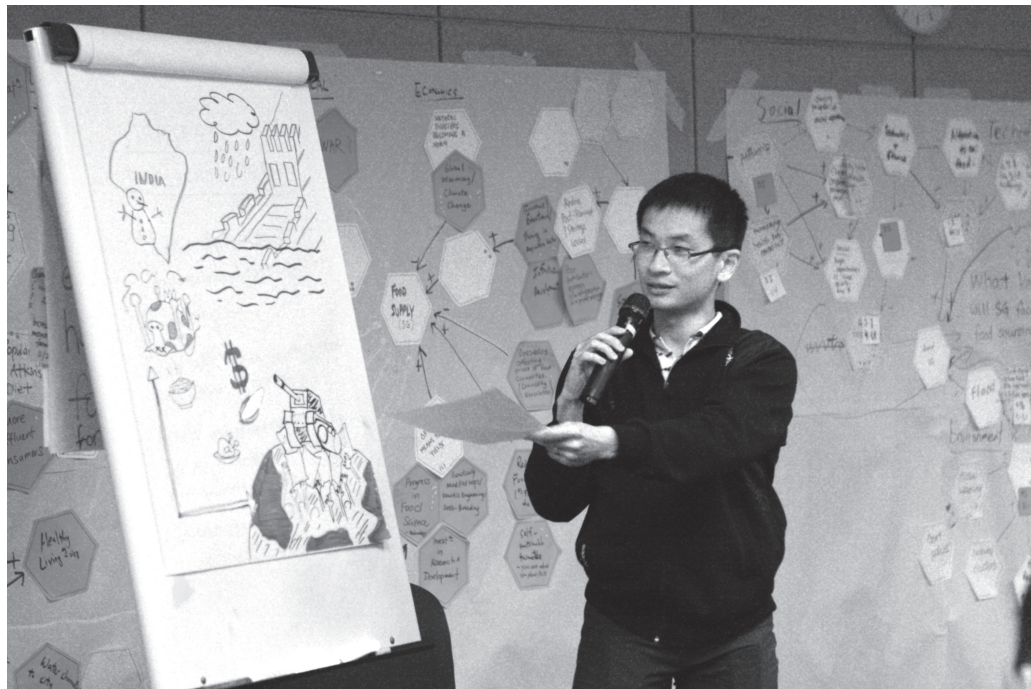
*A participant explains scenarios formulated during a Scenario Planning Workshop*

The rest of the FutureCraft series has been co-developed with the Ministry of Trade and Industry's Futures Group. The series comprises:

### FutureCraft 102: SP+ Tools

While SP+ as a whole comprises a wide range of tools and methods, FutureCraft 102 focuses on six of the most accessible tools by applying them to a public policy theme, such as “The Future of Food” or “Education in 2020”. The six selected tools are

- ▶ the Cynefin Model;
- ▶ the Futures Wheel;
- ▶ the Futures Triangle;
- ▶ Causal Layered Analysis;
- ▶ Shared History; and
- ▶ Backcasting.



*Group discussion on the Future of Food*

Backcasting, which involves envisioning a particular future and working backwards to the present, has been particularly popular among agencies. The envisioned future can be either positive (a “preferred future”) or negative (a “feared future”). In many ways, it is a natural companion to scenario planning, which moves forward from today to possible futures, via the trajectories of driving forces. A companion method used by some consultants involves creating “Photographs (or some other Artefacts) from the Future” – the underlying principle is similar in that it involves working backwards from an envisioned future state. Some recent applications of backcasting are detailed in the box below.

---

### APPLICATIONS OF BACKCASTING

During a workshop with senior decision-makers in May 2010, strategists from CSF and SPO experimented with backcasting, which challenged the participants to imagine different future worlds and think through the possible trajectories leading to those outcomes. Instead of merely positing what future scenario worlds *could* look like, the first step of backcasting called on participants to articulate what sort of worlds might be most preferred or feared for Singapore. It was not always a comfortable or easy process. Participants had to keep an open mind and grapple with their innate biases, mental models and assumptions about the world. Several commented that this was a worthwhile experiment, as it helped to unearth novel and interesting insights into issues that they had not previously considered – particularly social and values-related issues to which policymakers had not always given the most attention.

The Ministry of National Development also experimented with backcasting during its annual retreat in October 2010, while the Ministry of Information, Communication and the Arts used the technique in August 2011. Both agencies used the tool to encourage their officers to imagine a new operating environment, which provided a springboard for discussion on strategies for how to realise the preferred futures, while conducting monitoring and risk management strategies to mitigate the possibility of the feared futures.



**FutureCraft 103: Facilitating for Foresight**

Our experiences with scenario planning and recent experiments with SP+ have highlighted the critical importance of facilitators in any futures process. These personalities perform a complex mix of functions. They design workshops, communicate ideas and craft the experiences of decision-makers to elicit new thinking on future possibilities. Good foresight facilitators can “work a room” masterfully, drawing on the collective knowledge of the participants present.

Given the centrality of this role, FutureCraft 103 is designed to teach a variety of facilitation skills that can be employed for the purposes of knowledge elicitation and generation of new ideas. Among other things, it includes elements of Design Thinking, which has been used by global design firms to promote “customer-centred design”. The methodology involves a range of tools, including customer-focussed ethnographic research and rapid prototyping of new ideas that can be usefully applied to creating engaging and impactful futures products.

**FutureCraft 104: Curating the Foresight Experience**

Building on FutureCraft 103, 104 discusses the various ways facilitators can curate foresights sessions and products, through the use of different communication and presentation methods. These include graphic facilitation, serious gaming, creative use of videos and the creation of “artefacts” like the simulated newspaper headlines shared in an earlier chapter. During the sessions, participants have rightly realised that the curation of their products is limited only by their imagination, and many have gone on to produce creative products that they use in their own agencies’ strategic planning discussions.

**FutureCraft 105: Challenges to Good Foresight – Complexity & Cognitive Limitations**

As outlined in the previous chapter, complexity and cognitive limitations present genuine obstacles to the application and acceptance of foresight. FutureCraft 105, the first run of which will be held around the end of 2011, aims to build agencies' awareness of such limitations, premised on the idea that articulation of a problem is a major step in starting to address it.

The workshop will examine both cognitive issues and inability to make sense of complexity, including

- ▶ Decision Biases;
- ▶ Memory Biases; and
- ▶ Probability and Belief Biases.

Participants will be encouraged to explore how these biases and limitations play out in their work, and how they can be ameliorated. Part of the programme will hopefully include an extended conversation with a selection of senior decision-makers, so that their collective experiences can be shared and built upon by their younger colleagues.



## CHAPTER 4 – CONNECTIONS AND NETWORKED GOVERNMENT

Several senior decision-makers sometimes reminisce about their initial encounters with complexity expert David Snowden, early discussions with Peter Schwartz on scenario planning and explorations of early forms of RAHS with John Petersen, Jeff Jonas and John Poindexter. Many of these interactions took place over informal meals, as the personalities involved explored how their ideas interacted and synergised.

These meetings, and those organised since by SPO, the RAHS team and the CSF, reflect a fundamental belief in the importance of building strong connections in order to understand future possibilities. In large part, this involves the idea that chance favours not just the prepared, but the connected mind. This has been an underpinning belief in Singapore's futures work, which has relied significantly on both internal government networks, links with non-public sector agencies in Singapore and international connections.

Forging durable networks is a key means of addressing the challenges of cognitive biases and complexity discussed earlier. Within the government, discussions among networks allow for interaction among the various institutional blind spots that invariably exist in each agency and, hopefully, the realisation or reminder to consider a wide range of perspectives. Outside government, discussions with the CSF's international partners has allowed us to challenge traditional Singaporean mental models, and often raised new possibilities. As James Surowiecki suggested, sometimes one needs "The Wisdom of Crowds" to alleviate one's own cognitive limitations.

This chapter outlines the CSF's efforts at forging such networks.

### **Networked Government**

In addition to building the capability of individual futures officers, the CSF also plays a key role in building government-wide processes and capacity for futures thinking. Even during the early days of scenario planning, the approach to planning

for the future was “Whole-of-Government”, as the various teams that used scenarios attempted to synthesise perspectives from a range of agencies.

A major part of this role is carried out through building a community of futurists from agencies, each dealing with a particular domain of public policy, but also connected to one another so that their ideas cross-pollinate and are mutually enriching.

The CSF drew inspiration from the Futures Activists Network (FAN) in the UK to set up the Strategic Futures Network (SFN) in October 2009. Policy makers and strategic planners from across government agencies and statutory boards were drawn into the network. Each Ministry is represented by a Deputy Secretary, the next most senior civil servant after the Permanent Secretary. In early 2011, the Network expanded to include Chief Executives from key statutory boards that had started their own futures efforts.

The philosophy behind the SFN is that the members should be senior decision-makers who can deploy resources and influence officers within their organisations. The CSF’s role is to persuade these decision-makers that futures thinking is valuable. Rather than force agencies to comply with decisions “from the top”, the CSF leaves room for members to take ownership and lead their futures projects. The CSF also does not espouse a fixed model for how agencies

must organise their futures work. There have been many different initiatives customised to the contexts of different agencies. A key benefit of this approach is that agencies have learned to tolerate messiness, which in most circumstances is anathema to government bureaucracies.

The SFN meets every two months to discuss emerging issues as well as new tools or methodologies. It is chaired by the Head of Civil Service, and has helped to socialise civil servants to the idea of futures work as the Ministry representatives, called Strategic Futures Officers (SFOs), serve as useful evangelists for futures thinking.

**A major part of this role is carried out through building a community of futurists from agencies, each dealing with a particular domain of public policy, but also connected to one another so that their ideas cross-pollinate and are mutually enriching.**

Several SFOs have set up futures units in their own agencies, after recognising the importance and usefulness of futures work for their agencies. Futures units existed in the Ministry of Defence, the Ministry of Trade and Industry and the Ministry of Community Development, Youth and Sports prior to the SFN's establishment. Since the SFN began its work, futures units have been set up in the Ministry of Environment and Water Resources and the Ministry of Finance, as well as the Housing and Development Board. A horizon scanning unit has also been set up at the Agri-Food and Veterinary Authority. New units are being planned, including in the Ministry of Home Affairs. Futures work is also being undertaken by pre-existing planning or corporate divisions in several Ministries, including the Ministry of Education, the Ministry of National Development and the Ministry of Manpower.

### **Networks in Singapore**

CSF's non-government networks within Singapore include a range of think tanks, including the S. Rajaratnam School of International Studies (RSIS) at the Nanyang Technological University (NTU) and different sections of the National University of Singapore (NUS).

RSIS' Centre for Excellence in National Security (CENS) currently organises a Masters module on futures thinking, which has been taught by futurist Wendy Schultz (2009) and Helene Lavoix (2010–2011). Some of its academics have also attended the CSF's workshops and contributed to scenarios and other futures projects, as have other thinkers from NTU, including paleoseismologist Kerry Sieh from the Earth Observatory Singapore (EOS) on issues relating to climate change and vulcanology. NTU is also developing a complexity programme, which will explore the science behind, and applications of, complexity theory. The university's Institute for Catastrophic Risk Management (ICRM) examines the possible consequences of large-scale financial risk.

The Lee Kuan Yew School of Public Policy at NUS has provided the CSF with useful new thinking from its various research centres. The Centre for Asia and Globalisation has initiated insightful studies on the future of governance, particularly in the research of its former Director Ann Florini, a Brookings Fellow and global expert on how governance needs to evolve and adapt to growing roles of private and people sector entities. The Institute for Water Studies (IWS), and its Director Seetharam Kallidaikurichi, have also been strong partners, particularly on water and resource security issues.

At NUS' Institute of Southeast Asian Studies, former Danish diplomat Joergen Oestroem Moeller has been conducting research on possible futures for the Asia Pacific.

In addition to thinktanks, the CSF has also developed growing links with private sector entities in Singapore. Of these, the partnership with Shell is probably strongest, drawing on a long-standing relationship since the early days of scenario planning.

### International Networking

Even the most extensive network within Singapore would be subject to some form of “national” cognitive lens. To ameliorate this, the CSF endeavours to maintain a wide range of international contacts through study trips, roundtable discussions, international networks and conferences.

Study trips – or “Learning Journeys”, to borrow a term coined by the GBN – have been critical. Many of these are done by the CSF team, with learning later shared with the SFN to ensure that lessons are disseminated across the wider government. Since its inception, the CSF has visited places with strong traditions of forward planning and anticipatory thinking, including both coasts of the United States, the United Kingdom, the Netherlands, Finland, Switzerland and South Korea. Roundtable discussions called “FutureChats” are also held regularly when international partners visit Singapore or transit here *en route* to other destinations.

Since 2011, the CSF has also started Whole-of-Government Learning Journeys, to expose other government futurists to people and places that might spark new thinking. These “omnibus” trips help to ensure that insights applicable to multiple agencies can be accrued and learned on a collective basis. They also complement intra-agency trips, where agencies explore issues within their own specific domains.

Being plugged into international networks is another key priority for the CSF. The Global Futures Forum (GFF), International Risk Governance Council (IRGC), the World Economic Forum's Risk Response Network and the Davos-based World Risk Forum are prime examples of the growing number of international communities interested in exploring future-related ideas. All meet regularly, and where useful, Singapore has shared its experiences with both the opportunities arising from, and challenges to, having a robust government system of national foresight.

The CSF and its sister outfit the HSC also endeavour to be convening platforms in their own right. The HSC's International Risk Assessment and Horizon Scanning Symposium (IRAHSS), first held in 2007 and currently in its fourth run, is a useful gathering of futures practitioners from all sectors, and focuses particularly on methodology-related issues. The CSF's invitation-only Foresight Conference, currently in its inaugural run, complements IRAHSS with a focus on content issues. The theme of the first conference in October 2011 is "The Future of Asia & Its Place In The World". Experts have been invited from backgrounds as diverse as business consulting, academia and science fiction writing, to nurture a rich and varied cross-disciplinary discussion.




The Foresight Conference takes place at the same time as an international complexity workshop, organised by NTU. This is the third workshop of its kind organised by NTU, and offers a golden opportunity to identify deeper synergies between scientific research and applications of complexity in government and futures thinking, as is currently done with SP+ and RAHS. Additional applications of complexity can be studied if NTU's complexity programme successfully collaborates with other parts of the Singapore academic scene – RSIS on political-strategic risk, EOS on geological and environmental risk, ICRM on financial risk – and other global interlocutors. Such a connection of existing areas of work would raise current discussions on futures and complexity to new levels; this is an area we hope to examine in more detail in future volumes of this book.

**Whole-of-Government Learning Journeys... help to ensure that insights applicable to multiple agencies can be accrued and learned on a collective basis.**

# AFTERWORD

Memo to the Future

(From a time capsule closed in 2011, to be opened in 2030)

 New  Reply  Reply All  Forward  Delete

From: CSF Team 2011

To: CSF Team 2030

Subject: Six Lessons

Dear Team,

In much of our work, we have produced “Artefacts from the Future” – scenarios, models, photographs – to make future trends tangible and visceral for our decision-makers.

In this note, we would like to offer the converse: a memo, or artefact from the past, where we share some of our lessons with you. You may (and probably should!) find some of our analysis woefully “behind the times”, but we hope it provides you with a glimpse into how futures work was done 20 years before your time. If any of these lessons have been forgotten, as is wont to happen with frail human memories, then we hope this note is a timely reminder.

Our first, and arguably most important, lesson is that futures work is not, and should not be, about prediction. Our job has never been to gaze into a crystal ball and attempt to discern future outcomes like the oracles of old. Instead, our aim has always been to use futures as a way to better appreciate the complexity of the present. We have always attempted to be as useful as possible in providing insights to our government colleagues, even as we nudge them to (re)consider the mental models, biases and

lenses through which they perceive the world. We hope this is your aim too: to make better decisions today, rather than predict tomorrow.

We have also realised that futures work is never complete. Every report we wrote has led to new projects; every issue we analyse or workshop we organise has prompted new ideas. This can be tiring, especially for those new to our teams. Eventually, they have caught on to the fundamental reality that futures work is an ongoing campaign, a conversation that needs to be painstakingly curated. It is not just another discrete event to be organised, or another report to be written and filed away for posterity.

In crafting the various elements of these campaigns, we have often found it helpful to bear in mind the principle of “Obliquity”, popularised by the Financial Times journalist John Kay in his 2010 book. With futures, as with all complex phenomena, we have often found ourselves adopting indirect approaches. In conveying scenarios or versions of the future, for instance, we found it effective to “show, not tell” what we mean. Instead of prose renderings of scenarios, sometimes we have found it useful to draw, or create artefacts like this memo or a photograph, to convey our messages as viscerally and engagingly as possible. Implementing obliquity has mostly been challenging, calling for significant lateral thinking from all of us, and suspension of disbelief by the time-constrained decision-makers in our audience.

Our fourth lesson has been about the importance of “bio-empathy”, a term included by Bob Johansen, former president of the Institute of the Future, on his list of ten leadership qualities for a “VUCA” world (one that is volatile, uncertain, complex and ambiguous). Bio-empathy involves understanding the soft, emergent, non-linear qualities of complex systems, which are far more like biological ecosystems than mechanical systems governed by immutable input-output relationships. Bio-empathy has underscored for us that we might not be able to predict all the phase transitions that might occur in a complex system, arising from self-reinforcing feedback loops. Many of the governance challenges we have faced – like climate change, falling fertility rates and the advent of social media – display such biological characteristics, with major consequences sometimes resulting from minor perturbations. We suspect that in 2030, you will have even greater need of bio-empathy than we do, but of course only you will know that for sure.

Like the most resilient biological ecosystems, we have also learned the inherent value of diversity. Our best futures work has always been done after consulting a range

of contacts, from both in and outside the public sector, as well as in and outside Singapore. This has been critical in helping to attenuate any groupthink or other biases we might have brought to our analysis. However, we think we could have ranged even wider in some of our work – perhaps in doing massive public crowdsourcing for ideas, rather than just consulting with groups of experts in specific fields. From your perspective, you probably know with certainty whether such crowdsourcing will work – from the vantage of point of 2011, all we can say that is that perhaps this will be a new horizon for us in the years to come.

Our final lesson has been about the fundamental approach we take to futures work. After more than 20 years, it has become clear that our approach is what some practitioners would call “adaptive” futuring: we see the future as the exogenous result of a combination of trends, to which we must adjust and adapt. Much of this approach can be traced to the deep national narrative in Singapore, that we are a “little red dot” with little, if any, control over the global shifts that dictate our future. While this is an important reality, and one that keeps our policies grounded and pragmatic, we have also realised that it is not the only approach we can take. We can also afford to be more “activist” about the future, and try to shape our destiny in a more proactive way – particularly in areas where our small size give us the advantage of alacrity to seize new opportunities. All of you in 2030 will have a clearer picture about whether we need to be more adaptive or activist in our futuring: but from where we are today, we know we want to balance both ways of thinking.

We hope these thoughts are useful to you in understanding where the CSF has come from, which we believe is critical to shape where we head to next. Good luck!

PS – if time travel becomes a reality, please send us a reply. We’ll be waiting.









