

5. Governing for the Future: What governments can do

Peter Ho (Hak Ean)

On 25 February 2003, the Severe Acute Respiratory Syndrome (SARS) virus entered Singapore through three women who had returned from Hong Kong with symptoms of atypical pneumonia. The virus then spread with frightening speed through the hospital system. It confounded our medical authorities in the beginning. They did not know how the virus spread and why it spread so aggressively. The fatality rate was shocking. By the time the SARS crisis was declared over in Singapore, 33 people had died of the 238 who had been infected.

‘Black Swans’

SARS was an unexpected ‘black swan’ for Singapore. Nassim Nicholas Taleb (2008) described a ‘black swan’ as a hard-to-predict event with a large impact. Indeed, it was a frightening time for Singapore. Overnight, visitor arrivals plunged and the entire tourism industry came to a grinding halt. SARS severely disrupted the Singaporean economy, leading to a contraction and a quarter-long recession that year. There are many lessons to be learnt from the SARS crisis of 2003, but I would like to highlight one, in order to set the context for my contribution to this volume of essays. It is that other ‘black swans’ will surprise us, time and again, as much if not more than SARS.

In recent years the world seems to have been beset by a succession of strategic shocks including the destruction of the World Trade Centre on 11 September 2001, the financial and economic turbulence of 2008–09, the 2011 Japanese tsunami and nuclear meltdowns and the Eurozone crisis. I imagine the Christchurch earthquake of February 2011 was a ‘black swan’ for New Zealand. Furthermore, the frequency of such shocks seems to be increasing, and the amplitude of their impact appears to be growing. The question is why?

The Great Acceleration

From the middle of the twentieth century—a period sometimes called the ‘Great Acceleration’—change has accelerated at a pace on a global scale that is unprecedented in history. Population growth has surged. Combined with rapid

urbanisation, it has generated enormous consumer demand. The effort to meet this demand through industrialisation and mass production has had a huge but unpredictable impact on the Earth's ecosystem. Globalisation resulting from and combined with technological innovation has in turn accelerated change on all fronts—political, economic and social. Much of this change has followed unpredictable trajectories. The reason for this is 'complexity'.

Complexity

Complex is not the same as complicated. It is something very different. The natural world is complex. An engineering system like a machine or an aeroplane or a telecommunications satellite is merely complicated. Its inner workings may be hard for a layman to understand, but it is designed to perform certain predetermined functions that are repeatable. It embodies the Newtonian characteristics of predictable cause and effect.

In contrast, a complex system will not necessarily behave in a repeatable and predetermined manner. Cities are complex systems, as are human societies. The Earth's ecology is also a complex system. Political systems are complex. Countries are complex. The world as a whole is complex and unordered. In all likelihood, a complicated world has not existed for a very long time—if it ever did.

The Great Acceleration has seen huge leaps forward in technology—in telecommunications, the Internet and transportation—leading to vastly increased trade and the movement of people around the world. But the connections and feedback loops resulting from the Great Acceleration have greatly increased complexity at the global level.

The ancient Chinese philosopher Lao Tzu instinctively grasped the complex nature of the world we live in when he wrote in the *Tao Te Ching* (or *The Way*) that 'everything is connected, and everything relates to each other'. But connections and interactions within a complex system are extremely difficult to detect, are inexplicable and emergent. Efforts to model complex systems, such as the Club of Rome's famous model of economic and population growth, have not proved very useful. Unlike in a complicated system, the components of a complex system interact in ways that defy a deterministic, linear analysis. As a result, we are constantly surprised and shocked by 'black swans' and other unknown unknowns.

Wicked Problems

Unfortunately, complexity not only generates 'black swans', but also gives rise to what the political scientist Horst Rittel (Rittel and Webber 1973) called 'wicked problems'. Wicked problems have no immediate or obvious solutions. They are

large and intractable issues. They have causes and influencing factors that are not easily determined *ex ante*. They are highly complex problems because they contain many agents interacting with each other in often mystifying ways. They have many stakeholders who not only have different perspectives on the wicked problem, but also do not necessarily share the same goals.

Tackling one part of a wicked problem is more likely than not going to lead to new issues in other parts. Satisfying one stakeholder could well make the rest unhappy. A key challenge for governments is to move the many stakeholders towards a broad alignment of perspectives and goals; but this requires patience and a lot of skill in stakeholder engagement and consensus building.

Climate change is an example of a wicked problem at a global level. Pandemics are another. So are ageing populations in the developed world. Sustainable economic development, which is not unconnected to the triangular problem of food, water and energy security, is an enormous wicked problem.

In our increasingly interconnected and globalised world, such wicked problems do not manifest in a singular fashion. Their impact can and will be felt around the world, in many forms, and in many fields such as politics and economics, and in social and many other dimensions.

Retrospective Coherence

Complexity theory includes the concept of ‘retrospective coherence’. The current state of affairs always makes sense when we look backwards. The current problem is logical. But this is more than saying that there is wisdom in hindsight. It is only one of many patterns that could have formed, any one of which would have been equally logical. Simply because we can explain why the current state of affairs has arisen does not mean that we are operating in a complicated and knowable world.

While what we are today is the result of many decisions taken along the way, retrospective coherence says that in a complex system, even if we were to start again and make the same decisions, there is no certainty we would end up in the same situation. This is another way of saying that applying the lessons of history is not enough to guide us down the right path into the future.

Governments which do not understand retrospective coherence will often assume that the operating environment is merely complicated, not complex—one in which cause and effect are linked such that the output can be determined from the input, in which one step leads predictably to the next. This is of course a dangerous assumption if the operating environment is complex.

Governments and Complexity

When governments ignore the complexity of their operating environment, they are at risk of assuming that policies that succeeded in the past will continue to work well in the future. They will deal with wicked problems as if they are amenable to simple and deterministic policy prescriptions. The temptation to take this approach is understandable. It is easier, requires less resources and may actually lead to positive outcomes—but only in the short term; however, government policies that do not take complexity into account can, and often do, lead to unintended consequences, with a real danger of national failure in the long run.

Unfortunately, the evidence suggests that many governments will opt to take this path, out of political expediency, because of cognitive failures or simply because they lack understanding and the tools to deal with complexity. Governments which learn to manage complexity, and how to govern in a complex operating environment, will gain a competitive advantage over those which do not. But to manage complexity requires fundamental changes to the mindset, capabilities and organisation of government.

In his book *Making Things Work: Solving Complex Problems in a Complex World*, Yaneer Bar-Yam writes that ‘the most basic issue for organisational success is correctly matching the system’s complexity to its environment’. This is another way of saying that the complexity of the government developing the policy should match the complexity of the system that will be affected by the policy.

Fighting a Network with a Network

Let me illustrate this with an example. On 7 December 2001, the Singaporean authorities announced the detention of several Singaporeans who were members of a previously unknown network of Islamic extremists, the pan-South-East Asian Jemaah Islamiyah (JI). JI had been plotting acts of mass terror against several targets in Singapore. Singaporeans were preparing to kill fellow Singaporeans in pursuit of demented ideological goals.

This was the ‘black swan’ for Singapore that literally overnight produced a wicked problem for the Government: how to deal with the threat posed by extremists who were part of a larger South-East Asian network, and who lived and worked within the community, like ordinary Singaporeans.

Someone told me in those uncertain days that you needed a network to fight a network. It was a profound observation that implicitly acknowledged that JI, as a sprawling, multilayered network, was a complex organisation.

Our response, in terms of both organisation and policy, had to match JI's complexity. It was not possible to destroy the JI network by just hunting down the leadership and decapitating it. To do so would be to deny JI's essentially complex nature.

Singapore took a whole-of-government—perhaps even a whole-of-nation—approach to the threat posed by JI. The traditional approach—of delineating the boundaries between agencies, so each would be responsible for a particular area—clearly would not work. No government agency had the full range of competencies or capabilities to deal completely with this complex threat.

Rather than go the American way by creating our own Department of Homeland Security, we decided a better way would be to strengthen coordination and integration among government agencies. We leveraged on the diverse strengths of existing agencies. This meant coordinating the counterterrorism efforts of line agencies and ministries at the operational level, while integrating strategy and policy at the whole-of-government level. This approach meant we would only have a small but active centre, the National Security Coordination Secretariat, with the capacity to drive the strategic national agenda in counterterrorism, but which would not interfere with the accountabilities of each agency.

So, many agencies were included at different levels from the security, economic and social sectors. Community groups and leaders were activated to manage potential frictions and manage communal sensitivities. In the beginning, it was a real challenge. The non-security agencies felt that this was a matter to be dealt with by the security agencies. The security agencies in turn felt that their turf was being trampled on.

Whole-of-Government

Now, looking back, this whole-of-government approach had a compelling logic. A complex and multilayered network of government agencies and non-governmental organisations had been created. The policies that were implemented were complex—both defensive and offensive, employing both hard and soft powers. We established a complex system to deal with a complex situation. It is an approach the Singaporean Government has since applied to other wicked problems like population and climate change.

Governments will need to consider how they should be organised to deal with black swans, unknown unknowns and the wicked problems that complexity generates. Creating new departments to deal with new wicked problems can be wasteful and ultimately ineffective if these creations do not contain enough organisational complexity.

Developing policies and plans to deal with such wicked problems requires the integration of diverse insights, experience and expertise. People from different organisations, both from *within* and *outside* government, have to come together to pool their knowledge in order to discover potential solutions. Cooperative mechanisms need to be set up to enable the sharing of information and to strengthen collective action.

The whole-of-government approach injects diversity and complexity into the policy process. It recognises that in complex situations, and when dealing with wicked problems, insight and good ideas are not the monopoly of single agencies or of government acting alone. It strikes a balance between the strength and stability of the formal vertical government structure and the diversity of forms of different perspectives and solutions derived from a larger and more varied horizontal network of government and national resources.

While the whole-of-government approach may be an imperative, it is not easily achieved. Governments, like any large hierarchical organisation, tend to optimise at the departmental level rather than at the whole-of-government level.

In a hierarchy, the leader at the top receives all the information and makes the decisions; but, under stress, hierarchies can be unresponsive—even dangerously dysfunctional—because in reality decision-making bottlenecks exist at the top.

Complexity stresses hierarchies. The world that governments operate in today is too complex and too fast changing for the people at the top to have the full expertise and all the answers to call all the shots. Therefore, vertical silos need to be broken down, so information can flow horizontally to reach other departments. It is not ‘need to know’ but knowing enough so that each component of the larger organisation can respond to issues and challenges as they arise. An environment that encourages the spontaneous horizontal flow of information will enlarge and enrich the world view of all departments. This in turn improves the chances that connections hidden by complexity, as well as emergent challenges and opportunities, are discovered early.

‘Auftragstaktik’ (Mission Command Tactics)

The German military adopted with great success (at least at the operational level) a concept of military command called *auftragstaktik* (‘mission-type tactics’). It was a philosophy of command that acknowledged the complexity and the chaos of war.

In *auftragstaktik*, even the most junior officers were empowered to make decisions on the spot, because they had a better and more direct feel for the situation on the ground. It meant that down the line, every officer had to

understand not just the orders, but also the intent of the mission. In turn he was empowered to make decisions to adjust to the situation as he judged it, in order to better fulfil the intent of the mission.

Whole-of-government implicitly contains the central idea of *auftragstaktik*, which is that in complexity it is not possible for everything to be centrally directed. Not unlike *auftragstaktik*, whole-of-government depends critically on people at all levels understanding how their roles fit in with the larger national aims and objectives. Agencies must have a strong sense and a shared understanding of the challenges the nation faces, and the underlying principles to guide responses. Then it depends on the good sense of each agency to ensure its own plans and policies are aligned with the national imperatives, to the point that they instinctively react to threats and opportunities as they arise, knowing that what they do will advance the larger national, rather than departmental, interests.

Whole-of-government is a holy grail. In countries like Singapore, it remains very much a work in progress. It requires emphasis, support and constant attention from the top.

Dealing with Cognitive Biases

There is another challenge to governments in complex situations, as was evident in the April 2010 eruption of the Icelandic volcano Eyjafjallajökull. When a huge cloud of volcanic dust started to spread over Europe, air-traffic authorities grounded thousands of aircraft as a safety precaution. Europe was almost paralysed. It caused travel chaos around the world and disrupted global supply chains for weeks.

We know volcanoes erupt from time to time. We also know it is risky to fly through volcanic ash clouds. Yet why, despite this knowledge, was the world so surprised by and unprepared for the impact of this eruption?

First, although the risk of eruption is known, it is very difficult to assess its probability of occurrence. Behavioural economists point out that we underrate the probability of an event when it has not happened recently and overrate the probability of an event when it has. As a result of this cognitive bias, the risk of an eruption was underrated in this case, as Eyjafjallajökull had been quiescent for a long time.

Second, the effect of the eruption on aircraft flights was the result of complex interconnectivities and was therefore highly unpredictable. When the volcano erupted, aviation authorities depended on the predictions of analytical models and reacted with caution by shutting down all flights. But as the commercial

impact grew, the industry began to question the reliability of these models and proposed doing experimental flights to probe whether it was safe to fly. In the event, the experimental flights proved to be a better indicator for action than reliance on the models. This is a clear demonstration of the value of exploration and experimentation when we are confronted with complex phenomena instead of depending only on the predictions of analytical models.

Cognitive bias and the extreme difficulty of estimating the cumulative effects of complex events make preparing for unforeseen situations an exercise fraught with difficulty. It also adds to the challenges of governments operating in complex situations.

Managing Complexity

In such a complex operating environment, governments should be adaptive and able to navigate situations characterised by emergence, multi-causality and ambiguity, as they were during the eruption of the Icelandic volcano.

Governments often have to make big decisions, and develop plans and policies, under conditions of incomplete information and uncertain outcomes. It is not possible to prepare exhaustively for every contingency. Instead, a 'search and discover' approach should be adopted. The deployment of experimental flights to check out the real risk of flying into a cloud of volcanic ash exemplifies this approach. The military calls this approach the 'OODA' (observe, orientate, decide, act) loop, which is a recurring cycle of decision-making that acknowledges and exploits the uncertainty and complexity of the battlefield.

Scenario planning is a linear method of carrying out the OODA loop, in the sense that it projects futures based on our understanding of the operating environment today. Used intelligently, it can be a very important tool for planning, and can help overcome cognitive biases by challenging our mental models. But it is insufficient in a complex, unordered environment.

Nonlinear methods should be part of the government complexity toolbox. They include back-casting, policy gaming (which is akin to military war-gaming, but applied to the civilian policy context to condition policymakers to complex and uncertain situations, and to help them confront their cognitive biases) and horizon scanning (which is the process of detecting emerging trends, threats and opportunities).

Governments must also be able to manage the risk that is a natural result of operating in complexity. There will always be threats to national outcomes, policies and plans, because no amount of analysis and forward planning will eliminate the volatility and uncertainty that exist in a complex world. These threats constitute strategic risk.

There is, however, little by way of best practice to address systematically or ameliorate the threats to national goals that these risks pose. In Singapore, the Government is developing a unique Whole-of-Government Integrated Risk Management (WOG-IRM) framework—a governance chain that begins with risk identification and assessment at the strategic level to monitor risk indicators and, finally, to resource mobilisation and behavioural changes to prepare for each anticipated risk. WOG-IRM also plays an imperfect but important role in discovering the interconnections among risk factors. This in turn helps to reduce some of the complexity. The WOG-IRM framework is a work in progress, and we have started using it for strategic conversations on risks that occur at the whole-of-government level.

Organising in Complexity

The WOG-IRM framework is also critical to building resilience, which is the ability to cope with strategic shock by adapting to, or even transforming with, rapid and turbulent change. Resilience ought to be a key characteristic of governments that operate effectively in a complex environment.

Resilient governments must go beyond an emphasis on efficiency. Lean systems that focus exclusively on efficiency are unlikely to have sufficient resources to deal with unexpected shocks and volatility, while also having the bandwidth to make plans for an uncertain future filled with wicked problems.

This is not an argument for establishing bloated and sluggish bureaucracies; but it is important for resilient governments to have a small but dedicated group of people to think about the future. The skill sets needed are different from those required to deal with short-term volatility and crisis. Both are important. But those charged with thinking about the future systematically should be allocated the bandwidth to focus on the long term without becoming bogged down in day-to-day routine. They will become repositories of patterns that can be used to facilitate decision-making, to prepare for unknown unknowns, and perhaps to conduct policy experiments through policy gaming or other simulations.

To this end, the Singaporean Government set up the Centre for Strategic Futures (CSF) a couple of years ago. It is a think tank which promotes a whole-of-government approach to strategic planning and decision-making. It works on leading-edge concepts like WOG-IRM and resilience. It promotes fresh approaches like policy gaming for dealing with complexity. It encourages experiments with new computer-based tools and sense-making methods to improve horizon scanning. Although a small outfit, the CSF is a catalyst for strategic change in the government and its agencies.

Conclusion

The future promises ever more complexity, carrying in its train more black swans and unknown unknowns. Governments must learn how to operate and even thrive in this complexity, and to deal confidently with strategic shocks when they occur. The first step is to acknowledge the inherent complexity of the operating environment. Then they should consider the imperative of a whole-of-government approach, and the adoption of new nonlinear tools for managing complexity and strategic risk. These will not eliminate shocks. But by improving the ability to anticipate such shocks, governments might actually reduce their frequency and impact. In turn this will help make governments and nations more resilient as their leaders govern for the future.

References

- Bar-Yam, Y. 2004. *Making Things Work: Solving Complex Problems in a Complex World* (Cambridge, Mass.: Necs Knowledge Press).
- Rittel, H. and Webber, M. 1973. 'Dilemmas in a General Theory of Planning', *Policy Sciences*, 4(155).
- Taleb, N. N. 2008. *The Black Swan: The Impact of the Highly Improbable* (London: Penguin).

This text taken from *Future-Proofing the State: Managing Risks, Responding to Crises and Building Resilience*, edited by Jonathan Boston, John Wanna, Vic Lipski and Justin Pritchard, published May 2014 by ANU Press, The Australian National University, Canberra, Australia.