

## **The black elephant challenge for governments**

**This is an excerpt from a speech by Peter Ho, former head of civil service. He was delivering his first lecture on Wednesday as the Institute of Policy Studies' S R Nathan Fellow for the Study of Singapore.**

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Stephen Hawking, the world-famous theoretical physicist, said: "I think the next century (the 21st century) will be the century of complexity." But what is complexity? And what is its relevance to governance?

Complex is different from complicated. An engineering system is merely complicated. It could be an A-380 or a telecommunications satellite. Its inner workings may be very difficult (to understand) for a layman, who is more likely than not to describe it as complex, when it is actually just complicated. Complicated systems have Newtonian characteristics in that they perform pre-determined functions that are predictable and repeatable, in which input leads to a predictable outcome.

In contrast, a complex system will not behave in a repeatable and pre-determined manner. A complex system contains a large number of autonomous parts - agents - connected to one another, and interacting in a great many ways. They often generate their own feedback loops. To understand a complex system, we must understand not only the behaviour of each of these agents but also how they interact with one another, and how they act together as a whole.

Cities - like Singapore - are complex systems. They are made up of hundreds of thousands, even millions, of people - who are the "agents" in the parlance of complexity. Each person interacts with others, producing outcomes that often confound and astonish planners and policymakers.

All human systems are complex, not just cities. Countries are complex, as are political systems. The world as a whole is complex.

There are many definitions of complexity, but all of them agree that complex systems are characterised by the property of emergence. The connections and interactions among the many agents in a complex system lead to outcomes that are inherently unpredictable *ex ante*, and that are revealed only when they actually occur. So, when something happens, we are surprised.

### **Black swans and butterfly effect**

Nicholas Nassim Taleb famously described one class of such surprises - rare and hard-to-predict events - as black swans. In Taleb's view, black swans are not just surprising, but also have another important characteristic: their impact is large and game-changing.

In 2002, not long after 9/11, Donald Rumsfeld who was then US Secretary of Defence, introduced us to a close relative of the black swan, the unknown unknown. He said: "There are known knowns. These are things we know we know. We also know there are known unknowns.

That is to say we know that there are some things we do not know. But there are also unknown unknowns, the ones we don't know we don't know."

In this highly-interconnected world, what happens in one part is going to affect other parts - the so-called butterfly effect which postulates that the flap of a butterfly's wings in Brazil can set off a tornado in Texas. This was the title of a lecture by Dr Edward Lorenz.

The butterfly effect is the concept that small changes in initial conditions can produce large effects in a complex system.

### **Complexity and Governments**

The rise of complexity will generate more uncertainty, and increase the frequency of black swans and other strategic surprises. In other words, complexity can cause big headaches for governments.

Yet, governments often ignore the complexity of their operating environment. They typically deal with complexity as if it is amenable to simple and deterministic, even linear, policy prescriptions. In a sense, the crux of public policy has been to apply - if not impose - orderly solutions to the myriad of complex problems that afflict our societies, our politics and our lived everyday experiences, in largely vain attempts to make what is complex merely complicated.

We see this in legal systems that are based on uniform punishments for complex and varied crimes, in public health enterprises that treat patients as largely homogenous, and education systems and pedagogies that assume that all children develop uniformly, or ought to.

### **The Black Elephant**

This leads me to another member of my menagerie, the black elephant. The black elephant is the evil spawn of our cognitive biases. It is a cross between a black swan and the proverbial elephant in the room. The black elephant is a problem that is actually visible to everyone, but no one wants to deal with it, and so they pretend it is not there. When it blows up as a problem, we all feign surprise and shock, behaving as if it were a black swan.

Last year, many of us would have been astonished to learn that the Treasury in the United Kingdom had made no contingency plans for Brexit, despite the fact that the polls showed that the outcome of the referendum would be a close call. The British military - which I presume is like most armed forces and makes contingency plans at the drop of the hat - also reportedly did nothing. The UK government looked decidedly flat-footed the day after the referendum.

Surely this is an example of a black elephant? In fact, the only institution that had a Plan B was the Bank of England. My surmise is that because the Governor is not British - Mark Carney is Canadian-Irish - he had no emotional skin in the game, and could take an objective, dispassionate, look at the situation.

### **Governance in Complexity**

So, what can governments do to improve the way they manage complexity, and at the same time mitigate the effects of the various cognitive biases that afflict them?

We can start by accepting that complexity creates uncertainty. Prediction is not possible. The right approach is an orientation towards thinking about the future in a systematic way.

Clearly, changes need to be made to the way governments organise themselves. Their toolbox must be enlarged. We can adopt methods and processes that help us to reduce the frequency of strategic surprise, and when the inevitable shock occurs, to reduce the amplitude or intensity of its impact. Some of us call this foresight, or futures thinking.

There are foresight methodologies - ways to think about the future systematically, and ways to help overcome some of our latent biases and our inherent cognitive constraints. One of them is the famous scenario planning method, which was developed and pioneered by the oil giant, Shell. Shell famously avoided the impact of the oil shock after an Arab oil embargo imposed in 1973 after the Yom Kippur War.

Today, scenario planning is a key part of the Singapore Government's strategic planning process. National scenario planning exercises are run every few years, and are even incorporated into the annual Budget cycle. The resultant scenarios are used by ministries and agencies as a base reference for their own strategic planning.

The big benefit of scenario planning is that it helps to overcome our cognitive biases by surfacing hidden assumptions and challenging mental models.

Scenario planning helps to inculcate an anticipatory mindset in planners and policymakers so that they instinctively raise "what if" questions on the issues they deal with. It helps them to overcome their blind spots, and to confront or at least be aware of black elephants.

### **Wicked problems**

The complexity of our operating environment that produces black swans also produces wicked problems - complex, large and intractable, with no immediate or obvious solutions. They have causes and influencing factors that are not easily determined ex ante. They hardly ever sit conveniently within the responsibility of a single agency. Worse, they have many stakeholders, each of which sees these problems from different perspectives, and who have divergent goals. This means there are no immediate or obvious solutions, because nobody can agree on what the problems are in the first place, never mind what the solutions should be.

Wicked problems include the big challenges of our age, such as climate change, the environment, population, urbanisation, inequality. Most crises are wicked problems. There are many stakeholders, but they have competing perspectives and divergent interests. Please one and you upset many others. Solve one problem and others will arise.

Terrorism is a particularly wicked problem. Even if everyone agreed on how to distinguish terrorists from legitimate freedom fighters, and there was consensus that terrorism should be banished, it is not clear that any policy prescriptions would gain universal acceptance. If that

were the case, terrorism would not be the persistent problem that it is today, and the Islamic State would not be such a serious threat.

There is no single agency in government that is really equipped to deal with a wicked problem in its entirety. But, letting departments tackle different parts of a wicked problem on their own often leads to duplication or to waste and sub-optimal policies, and even to new wicked problems.

### **The dangers of reductionism**

Efforts to understand our complex world and to deal with wicked problems often rely on an assumption - that what is complex can be reduced to simpler subsets that are easier to evaluate, and that when re-aggregated, will produce results that approximate the real world.

This approach is reductionism. It led to the tendency to dissect the complex world into smaller and less complex parts, and to favour explanations framed at the lowest level of scale.

Arguably in government, the assumption of reductionism results in a tendency to divide big problems into smaller pieces. It goes a long way to explain the proliferation of agencies and bureaucracies as standard response to emerging and wicked problems.

Despite the enormous importance of this approach, it gives the false impression that investigating things at a holistic level is less informative than investigating the properties of the components. Outside the realm of science, reductionism has not been as effective in explaining phenomena in such areas as ecology and economics.

Complexity science abjures reductionism for the study of how systems interact with other systems, how agents interact with other agents, and then how these lead to emergent, rather than causal, results.

Complexity science tools include agent-based modelling, which examines how autonomous agents interact with one another and influence system behaviour. These tools, when applied to economics and to other areas like urban planning, provide fresh and usable insights that deterministic models have failed to produce. In Singapore, government agencies are beginning to use such tools to address complex problems in areas such as land transportation, health and housing.

### **Everything is connected**

Another way to counter the problems inherent in the reductionist approach is to look at situations more holistically. This is important because in our complex world, "everything is connected to everything else". If we look at each issue from a narrow perspective, we will miss the wood for the trees.

At heart, this is an argument in favour of enlarging our field of vision to see how economics, demographics, societal issues, issues of environment and of technology, interact with each other to produce the complexities of the operating environment. This is a more interdisciplinary and counter-reductionist approach.

Interdisciplinary collaboration is essential for solving the big challenges of today, in science and technology, in the social sciences, in the economy, in urbanisation, and in the environment. Why not also in geopolitics, geo-strategy and geo-economics? It is not possible, for example, to separate the conduct of foreign policy from other large national interests like economics and trade. So, there has to be a lot of internal coordination, and sharing of information.

To this end, inter-agency cooperation requires good leadership to grow. This is, in part, reflected in Singapore's coordinating ministers, a position first established in 2003 with the appointment of the first-ever Coordinating Minister for Security and Defence. Now there are three coordinating ministers, who cover the entire spectrum of government functions - namely national security, economic and social policies, and infrastructure. The establishment of these three positions marks the transformation of the Singapore Government from a traditional hierarchy into a new-age system of government, characterised by a Whole-of-Government approach.

### **Whole-of-government**

This transformation is significant, because the Whole-of-Government approach is an important response to managing complexity and dealing with wicked problems.

An organisation that breaks down vertical silos encourages the spontaneous horizontal flow of information that will enlarge and enrich the worldview of all agencies. This improves the chances that connections, emergent challenges and opportunities are discovered early.

It is a mindset of willingly working together to achieve common national outcomes, instead of serving the interests of individual agencies.

Take terrorism as an example. No single ministry or government agency - not Mindef (Ministry of Defence) or MHA (Ministry of Home Affairs) - has the full range of competencies or capabilities to deal with this threat on its own. Instead, the efforts of many agencies have to be coordinated and brought to bear on this problem in a Whole-of-Government approach. This insight - and the looming challenge of transnational terrorism - led the Singapore Government to set up the National Security and Coordination Secretariat.

Whole-of-Government looks eminently reasonable - on paper. But it is not easily achieved. Governments, like any large hierarchy, are organised into vertical silos. For Whole-of-Government to work, these vertical silos need to be broken down, so that information can flow horizontally to reach other agencies.

But this is a Sisyphean effort. Whole-of-Government is antithetical to a deeply-ingrained bureaucratic instinct to operate within silos. More insidiously, institutional identity is sometimes so strong that it colours how each agency views or prioritises national interests.

One of the big challenges of government - especially the hierarchical Westminster Western model that the Singapore Government is derived from - is the occurrence of bureaucratic silos, where information and coordination flow vertically, rather than develop horizontally. This is, in turn, an organisational impediment to the sharing of insights and information critical to thinking about the future.

This is a big hurdle to overcome.

It requires not just a lot of effort but also a real change of culture. Often, the leader must nag his people to remind them that the Whole-of-Government imperative takes precedence over narrow sectoral interests and perspectives.

The Whole-of-Government approach is today a priority of the Singapore Government. There are inter-agency platforms that have been established to share information among ministries, statutory boards and other agencies, in order to take in different ideas and insights, so that wicked problems can be viewed in their manifold dimensions.

Coordinating bodies now deal with cross-agency strategic issues, like the National Climate Change Secretariat and the National Population & Talent Division. Two years ago, the Government set up the PMO Strategy Group with the mission of Whole-of-Government policy development and coordination. And most recently, the Government announced the establishment of the Smart Nation & Digital Government Group to give a further Whole-of-Government push to the Smart Nation effort.

### **Urban planning**

Let me take up the issue of urban planning, a uniquely wicked problem for Singapore. While other countries have large land areas, which allow new cities to develop and replace other cities that may decline in relevance and fortune, Singapore, as a small city-state in an island, does not have that luxury.

Instead, urban planning in Singapore needs to take into account the challenge of packing in housing, green space, industrial land, commercial and retail space, land for transportation needs, and military training areas, all within the confines of a small island of 718 sq km. This is less than half the size of London, and two-thirds the size of New York City.

In Singapore, the entire process of urban planning involves close collaboration among economic, social and development ministries and agencies. It also entails consultations with various stakeholders in the private sector and the general public. This approach enables all stakeholders to better understand interdependencies and implications of land use and strategic decisions.

Planning so far ahead and for multiple possible functions is inherently complex and invariably involves many uncertainties. So, national scenarios are used to factor in these uncertainties. Plans are also regularly reviewed. This process of long-term planning and regular review has enabled Singapore to anticipate its needs far in advance, and provides the flexibility to respond to surprises and to adapt to changes over time.

But such plans are only possible because of the embrace of a Whole-of-Government approach, in which trade-offs in land use are made among agencies. What is protected is not the narrow sectoral interests of the various ministries and agencies, but the larger national interest. It is not just a matter of coordination of roles and actions. At its core, Whole-of-Government means

finding consensus on strategic priorities. Consensus is made possible because processes like scenario planning help align the government agencies to the larger national interests.

### **Whole-of-nation**

But with increasing complexity, the role of the government transforms from being a direct service provider, and becomes more of what the Manhattan Institute for Policy Research describes as a "lever of public value inside the web of multi-organisational, multi-governmental and multi-sectoral relationships".

This is sometimes called networked government, which refers to the management of the webs of relationships within and surrounding government.

For instance, government social services rely on collaboration with non-profit and community-based organisations. Examples like this do not indicate a diminishing importance of the government's role. Instead, government may be understood as having multiplied its capabilities by extending its reach beyond its institutional boundaries.

A government that operates in a networked manner deploys mechanisms that promote reach within the whole nation. Tackling the Jemaah Islamiah (JI) threat is not just about removing the immediate threat that the JI posed to Singapore's security. It also requires engaging multiple stakeholders, including community groups like the religious teachers who started the Religious Rehabilitation Group. It means engaging the private sector to help develop protective systems, processes and security infrastructure. This approach clearly needs not just many agencies of government coming together, but also bringing in the people and the private sectors.

In a way, it is not just a Whole-of-Government approach, but also a Whole-of-Nation effort. This is because the JI poses a multi-dimensional threat that requires not only collaboration among security agencies, but also with social agencies that have oversight of issues affecting local communities. The Singapore approach is to fight the JI network with Whole-of-Nation networks. This is networked government in action.

This Whole-of-Nation approach continues today with the SGSecure initiative, which is specifically targeted at building community networks. The SGSecure national movement aims to "sensitise, train and mobilise the community" as part of its response in the face of national threats.

The rise of complexity in the world today throws up enormous challenges for governments. Black swans will confront them, and they will have to deal with wicked problems. Black elephants will be lurking in the background.

Foresight will help governments to better deal with complexity and its challenges. The concept of governance must also change, in tandem with rising expectations and a more educated and empowered citizenry. Government-by-Agency will evolve into Whole-of-Government, which in turn will embrace the broader Whole-of-Nation approach that includes business, civil society and the man in the street.

Collectively, these multi-sectoral actors will change the concept of governance, even if they are not part of "government", traditionally defined. The future of governance in a world of complexity lies in such systems-level coordination.