Imagining endless possible futures

Imagination is vital for a small country like Singapore in aiming big to stay ahead of the competition, said former head of civil service Peter Ho. And while Singapore's aim to be a Smart Nation is a product of its imagination, it is also limited by the nation's imagination, added Mr Ho in an IPS-Nathan Lecture on Wednesday. Below is a excerpt from the lecture by Mr Ho, who is currently the senior adviser to the Centre for Strategic Futures.

Peter Ho
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THE central thesis in Professor Clayton Christensen's seminal book, The Innovator's Dilemma, is that successful organisations are doomed to fail in the long run, because there is tremendous inertia to change a formula that has worked well.

In other words, the incumbents of today are locked-in to their mental models and success formulas. They are prisoners of what they know they know. It is this inertia that allows the insurgents, the revolutionaries, the start-ups, to sneak in, change the rules of the game, capture market share and dislodge the incumbent.

While this conclusion is based on the study of companies, Prof Christensen told me some time ago that he thought the same principles apply to governments.

Clayton Christensen's solution to the innovator's dilemma is to create small self-contained units within the larger organisation that have the mandate to experiment with new ideas and new concepts.

"Mainstream firms," he writes, "establish a timely position in disruptive technologies only when the firm's managers set up an autonomous organisation charged with building a new and independent business around that disruptive technology."

If these new units succeed, then their formula can be proliferated through the organisation. If they fail, then the organisational impact will be contained. A model of this approach is DARPA – the legendary Defense Advanced Research Projects Agency of the United States Department of Defense that has been the force behind game-changing innovations like the Internet, GPS, and quantum computing.

In a similar — though more modest — vein, the Ministry of Defence set up the Future Systems Directorate (or FSD) — now known as the Future Systems & Technology Directorate — some 20 years ago with the mandate to think about the longer term challenges facing the Singapore Armed Forces, and to come up with new operational concepts, experiment with these concepts, and then implement them.

Mindef knew then that the FSD would generate frictions and tensions in the system by the very nature of its mission. It would make many feel uncomfortable. But I believe that the FSD was the catalyst for the innovation and the spirit behind it that transformed the Singapore Armed Forces from a 2G into a 3G SAF.

Going forward, this has to be the way for the SAF to stay ahead. It is not possible to maintain its strategic edge just by buying more and more weapons and platforms. The budget will not support this approach. Instead, the SAF's strategic advantage will be secured by exploiting its capacity to innovate and to change, changing the rules of the game, through better operational concepts and superior application of technology to realise these concepts.

Learning how to exploit underground space

Singapore has experimented with radical concepts to address our land constraints, especially in the use of underground space. Some of the major experiments include the Underground Ammunition Facility of the Singapore Armed Forces, the Deep Tunnel Sewerage System, and the Jurong Rock Caverns.

The success of these experiments convinced the government to exploit underground space systematically, and it has now embarked on developing a comprehensive masterplan for underground space.

At the launch of the Jurong Rock Caverns, Prime Minister Lee Hsien Loong made some remarks that I think encapsulate the importance of such an experimental approach:

"We must constantly think out of the box, be bold in tackling our challenges, be tenacious in execution in order to create new space for ourselves whether it is physical space, whether it is space which is metaphorical, thinking space, international space, and development space. It is not just that the sky is the limit, but there are also fewer limits than we think to the depths to which we can go because we are limited only by our own imagination!"

Importance of imagination

This brings me to the importance of imagination.

I recently read a fascinating interview with the famous physicist, Nikola Tesla, the inventor of the alternating current.

The interview is dated 30th January 1926. In that interview, Tesla talks about aircraft that will "travel the skies, unmanned, driven and guided by radio." He said that while "motion pictures have been transmitted by wireless over a short distance … later the distance will be illimitable, and by later, I mean only a few years hence." And he thought that "temperate zones will turn frigid or torrid." The world he described nearly a century ago is already upon us – drones, television and climate change.

There are also futures that are not quite with us yet, but they are emerging. In his interview, Tesla spoke of power being "transmitted great distances without wires."

And his most fascinating vision was of wireless achieving "closer contact through transmission of intelligence, transport of our bodies and materials and conveyance of energy." In his vision,

"When wireless is perfectly applied, the whole earth will be converted into a huge brain, which in fact it is, all things being particles of a real and rhythmic whole. We shall be able to

communicate with one another instantly, irrespective of distance ... and the instruments through which we shall be able to do his will be amazingly simple compared with our present telephone. A man will be able to carry one in his vest pocket."

We may not be a single global brain — yet — but our mobile phones certainly do fit into our pockets. In its time, Tesla's description was an amazing feat of imagination. We can aim to make improvements, step-by-step, but for a small country like Singapore, it is better to aim big, in order to stay ahead of the competition. In this regard, imagination is vital.

Imagination and the smart nation

Singapore has a big ambition, to become a Smart Nation. But what is a Smart Nation? At one level, it is about the exploitation of technologies in order to make the lives of people better, by giving them convenient and fast access to information, and to customised services, including those that we cannot even imagine today. The current state of technology already offers all the ingredients of a Smart Nation.

But at another — I would argue more fundamental — level, being a Smart Nation calls for innovation at the systems level — aggregating technologies and combining them with new operating concepts, policies and plans — to solve national problems such as the effects of climate change, traffic congestion, an ageing population, or simply to improve service delivery. But its realisation is the sum of many innovations, big and small.

Its ambition should be big, but its implementation is in hundreds and thousands of projects, both large and little.

But at both levels, it is a product of our imagination, and it is only limited by our imagination. Like Nikola Tesla, we can only begin to imagine the endless possible futures.

Imagine a Smart Nation where there is increased efficiency, convenience and connectivity in and between workplaces and homes.

Wearable technology such as hologram devices are used on the go to check and respond to work e-mails.

Wi-Fi is available island-wide, eliminating restrictions from fixed data and limited call minutes. In the workplace, robots take over routine administrative tasks, coordinating meetings, conducting research and running daily errands.

At home, robotic helpers do the household chores and prepare meals. They order groceries when food items are low in stock, which are then delivered by drone to the doorstep.

Throughout Singapore, there are healthcare pods deployed island-wide at every housing block. These provide medical diagnosis, dispense medicine and provide simple medical services as well. These make it more convenient for elderly residents who have mobility problems and for those who do not have the time to visit a clinic.

However, government may not be structured to reach this level of imagination and boldness of vision. Some might argue that it is not even its business. Innovation at this level is perhaps better achieved by the private sector, and by individual start-ups with the daring and the ideas.

Empowerment is key. Too much top-down control will kill the spirit of innovation that is central to Smart Nation.

Instead, the role of government should be to facilitate such innovation by funding incentives and arrangements, and through flexible – rather than restrictive – regulations.

A good example of this approach is the Monetary Authority of Singapore's establishment of a regulatory sandbox last year to allow FinTech companies to experiment with products and services in an environment where if an experiment fails, "it fails safely and cheaply within controlled boundaries, without widespread adverse consequences."

The government also has a key role in connecting these innovations to their societal environments by encouraging and organising test-bedding and pilots of Smart Nation technologies in real-life settings, and perhaps even by insuring the risk of some of these experiments.

In Singapore, a precinct — One North — is now the site of a major pilot for the use of autonomous vehicles — or driverless cars — testing not just the technologies for the cars, but also for the road furniture.

Such experiments and trials are essential because the development of these technologies and their applications need to be test-bedded in real environments.

If the pilot is successful, then the programme may be expanded beyond this precinct into the larger national transport system, relieving road congestion and getting people to their destinations faster — and more safely — and, like Car-Free Sunday SG, helping to realise the vision of a car-lite Singapore.

The politics of the smart nation

But there is a political challenge to such ambition. There are many misconceptions about the technologies associated with a Smart Nation. One big misconception is that in a 24/7 online world, constantly surrounded by innumerable sensors and smart objects, all connected to the Internet — the Internet of Things — absolute privacy and absolute security can be achieved.

As smart objects seek to gather more contextual information on behaviour and actions, the ability of smart devices to analyse people's lives and discover their identities will challenge traditional notions of privacy. Such information can clearly be misused and abused, compromising privacy and security. There is another related issue — a fear, perhaps irrational in some countries, and rational in others — that the government will exploit these technologies to intrude into the private lives of citizens or to create an Orwellian system of mass state surveillance.

To overcome these misconceptions, a mature discussion is needed, not a polemical one. The government has a central role to play in shaping this discussion. It will have to persuade citizens that the benefits outweigh the risks of exploiting these technologies, and then explain how the risks can be managed.

This is clearly in the realm of politics, and the onus must be on the political leadership to convince the people that such fears are misplaced in Singapore.

But this can only be achieved if there is trust between the people and the government. As I observed earlier, trust in a fast-changing and complex world — the world of the Anthropocene — is a vital asset to good governance.