Developing Singapore as a smart nation

Josephine TEO

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Creating trust in digital services is key to building a tech-enabled society. Mrs Josephine Teo, Singapore's Minister for Communications and Information, and Minister-in-charge of Smart Nation and Cybersecurity, speaks about leading the country's Smart Nation drive.

Come November 2024, Singapore's Smart Nation initiative will celebrate its 10th anniversary. Could you reflect on its key achievements and challenges in managing an ever-growing demand for seamless and effective digital government services?

I am not a science-fiction fan but what Arthur C. Clarke, the author of *2001: A Space Odyssey*, said strikes me as profound: "Any sufficiently advanced technology is indistinguishable from magic."

In many ways, this has to be our ambition for the Smart Nation strategy. It means using technology so well that you are delighted by the experience, without even knowing what technology is used, and how.

That is how we feel when we land at Changi International Airport. We clear immigration and get our bags quickly. In no time at all, we are hugging our family or friends at the arrival hall. We do not know what technologies they used to get these things done, and frankly we do not *want* to know as long as they work.

More often than not, technology also frustrates us. Your favourite *char kway teow*[1] is ready but the bank app on your smartphone is not working so you cannot pay for it. Or the company's information technology (IT) system is so backward it makes you tear your hair out.

Nowadays, technology can frighten us too, such as not knowing if we have accidentally downloaded some malicious app that will cause us to lose our life savings. Or we are troubled by the nastiness and lies we see online.

So the Smart Nation effort, apart from trying to promote all the wonderful technological innovations, must also deal with the not-so-great things.

When I am asked by fellow policy-makers outside Singapore, I tell them we have four pillars in our Smart Nation initiative–a vibrant digital economy, a stable digital society, a progressive digital government, and comprehensive digital security. They love that we are so clear, but I always tell them, "Look, we're still only at the starting line. There is a ton of stuff we want to do and no ready playbook. So, let's learn as quickly as we can, together."

With Singapore releasing its latest National AI Strategy (NAIS) 2.0 at the end of 2023, how would it help close or improve some of the gaps that you have identified prior?

We released NAIS 2.0 as one of the key planks of the Smart Nation effort. It lays out our thinking to unlock even more opportunities from Artificial Intelligence (AI) for our people and businesses, and better manage the risks and disruptive effects of the technology amid recent advances, especially in Generative AI (GenAI), which is a subset of AI that can create novel and realistic content, such as images, text, and audio. Under NAIS 2.0, we continue to make holistic investments in our people and the computing infrastructure supporting AI innovation.

For people, we adopt a segmented approach to talent attraction and development, welcoming top-tier talent (Creators) and their teams to work with and from Singapore, and tripling the number of scientists and engineers (Practitioners) in Singapore working on data and machine learning to 15,000. Creators are engaged in novel and cutting-edge AI activities and can have an outsized impact in fostering a culture of experimentation and excellence in AI, while practitioners are the backbone of AI deployment at scale. For computing infrastructure, we are committed to working with industry partners to ensure that we have sufficient high-performance computers available in Singapore, to meet our growing research and industry demands, and support high-value AI activities.

One of the things we learnt over the course of implementing the first iteration of our Smart Nation strategy in 2019 was to take a systems approach. This means we need to bring partners and individuals from industry, research,

and civil society together to contribute to our resources, capabilities, and infrastructure for AI development and deployment. We have also updated our approach to being a super-catalyst. This means promoting meaningful AI activities in industry, government, and research.

In industry, we want to not only grow Singapore's overall bench strength of leading AI industry developers and deployers, but also drive sophisticated AI value creation and usage in key sectors. We will therefore attract and anchor new AI Centres of Excellence (CoEs) in Singapore-based companies, and explore establishing industry-wide AI innovation platforms in key areas like advanced manufacturing, as well as financial and biomedical services, where Singapore is operating at the leading edge.

In government, we want AI to meaningfully power even more public services, and will double down on driving public sector adoption of AI in our 'Smart Nation Priorities': Healthcare, Education & Manpower, Trust & Safety, and Public Service Delivery. In research, we will sharpen our focus to support the widespread, trusted deployment of AI across society, by investing in Responsible AI, Resource-Efficient AI, and Reasoning AI.

We will also increase the support for our workforce and enterprises under NAIS 2.0. Our citizens and enterprises must have access to the latest tools, and the confidence that they can succeed in an increasingly AI-enabled world in which AI will benefit not just a few players, but all segments of society.

We recognise the uneven impact of AI on the nature of work across different industries, and will invest significantly in adult education and training, including sector-specific AI training programmes, to reskill and upskill our workers. We will also address the low AI adoption rate among our enterprises (currently at four percent) through more public-private partnerships and innovation acceleration programmes that lower the barriers to AI experimentation.

Take, for example, our AI Trailblazers initiative with Google Cloud, which linked up its AI toolsets and best-in-class support services with over 80 businesses and government agencies across Singapore. Not only did we manage to spark more experimentation, generating novel use cases within 100 days, but we also gave many business owners the confidence to invest further resources once they saw the business value of AI. One such business owner is Doctor Anywhere, a telemedicine service that developed a GenAI tool that helps recommend specialists based on a patient's preferences and books the appointment once the patient selects a specialist. This tool can be accessed 24/7, whenever

the patient needs it, and has already resulted in improved operational efficiency by 30 percent. Considering the overall value and impact of AI Trailblazers, we estimated that we have accumulated more than S$10 million annually in terms of time savings and efficiency gains.

Notwithstanding such opportunities, we remain mindful of AI's risks and the many ways that AI can be misused, from deepfakes, to scams, cyber-attacks, and the spread of misinformation. There are also moral and ethical issues around delegating certain instances of decision-making to machines. We will continue to find a pragmatic balance between innovation and safeguards, while considering the interests of users and technology providers.

There is no silver bullet to overcoming the disruptions AI poses. We will encounter more obstacles and 'gaps' when maximising the opportunities generated by AI while managing the evolving problems they pose. We will have to work through these issues with our partners from industry, research, civil society, and other governments.

What has Singapore done and what more does it plan to do to protect the nation and its citizens from the excesses and shortcomings of AI and other emerging technologies?

As we set out to unlock the transformative potential of AI, we are also mindful of the risks and challenges that AI may pose, such as ethical dilemmas, social implications, and security threats. We have taken a pragmatic approach to AI governance and ethics, which is to put up guardrails against systemic risks, while allowing innovation to thrive.

Singapore has been a pioneer and leader in this area, both regionally and globally. We were the first in Asia to develop and launch a Model AI Governance Framework in 2019, which provides practical guidance for organisations to implement ethical and accountable AI practices. The framework is based on two core principles: decisions made by AI should be explainable, transparent, and fair; and AI systems should be human-centric. Since then, we have updated and enhanced the framework, considering the feedback and experiences from various stakeholders, including industry players, academia, and civil society.

Building on this framework, we are currently developing a new framework for GenAI. It has significant transformative potential but comes with new and unique risks, such as the creation of deepfakes and synthetic media, which can undermine trust and cause harm. This new framework covers nine dimensions, such as content provision, security, and

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accountability, to support a comprehensive and trusted AI ecosystem. Right now, we are seeking international feedback on the framework, and it is expected to be finalised by mid-2024.

Speaking of deepfakes, the use of it for malicious means is a concern for all societies. We must examine how legislation can be put in place to regulate it, but in exactly what shape or form it will take, we will have to see. In the meantime, we are already working with industry partners to strengthen our capabilities to deal with such threats. For example, the Centre for Advanced Technologies in Online Safety (CATOS), which will be launched in the first half of this year, aims to enhance industry collaboration and knowledge exchanges in deepfake detection.

To complement our efforts to build a safe and inclusive digital society, we have introduced public education programmes on digital media and information literacy. For example, the National Library Board's (NLB) signature S.U.R.E. (Source. Understand. Research. Evaluate.) programme, launched in 2013, offers a wide variety of resources and programmes, including free courses, talks, tours, and workshops, that support everyone of all ages to learn information literacy skills. The resources in Singapore's official languages—English, Chinese, Malay, and Tamil—cover topics ranging from fighting online scams, to GenAI tools, Information Literacy, Digital Safety and Digital Wellness, and the dangers of misinformation.

Amid today's contested and fragmented international AI landscape, and the difficulty for a small country like Singapore to solve complex challenges of AI on our own, we must plug ourselves even more deeply into global networks, deepening research and technical collaborations to support innovation across borders. We do this through partnerships with the UK's new AI Safety Institute, and supporting multilateral, multi-stakeholder platforms such as ASEAN (the Association of Southeast Asian Nations), the Forum of Small States, the United Nations, and the World Economic Forum. No one should be left out of the global conversation on AI.

Beyond AI, what other aspects of the Smart Nation initiative can we expect to be further enhanced or improved upon in moving Singapore towards becoming a more technology-enabled society?

A big focus for us is trust and safety. Today, 85 percent of Singaporeans say that overall, technology has benefitted them. Their confidence in going online safely determines whether they choose to participate in or withdraw from the opportunities that technology and digital innovations can bring. So we are sharpening how we govern and manage the digital domain to facilitate safe, secure, and enriched digital participation.

In recent times, people have become much warier due to issues such as scams. We have observed how scammers are increasingly exploiting online platforms and new technologies, including the use of malware, to carry out their crimes.

Strengthening our partnership with various major digital platforms is one key way we are combatting this. For instance, to contain the impact of scams, we are exploring the possibility of co-locating staff from online platforms at the Anti-Scam Command (ASCom). This will help to enhance coordination amongst key parties to respond to scams more quickly. Today, bank staff are already co-located with the police at ASCom to facilitate the swift freezing of scam-tainted accounts, and tracing of scammed monies.

In January 2024, we operationalised the Online Criminal Harms Act (OCHA). This legislation enables us to take a more proactive approach to countering scams occurring on online platforms. For a start, OCHA will allow the Government to issue directions to online platforms to prevent Singapore users from coming into contact with scam accounts and content. With OCHA, directions can be issued proactively once scam activities are detected, without having to wait for victims to first fall prey.

To sustain our containment efforts, we must also work to prevent scams from occurring in the first place. Hence, as part of OCHA, we will also be introducing a framework later this year to further strengthen our partnership with online platforms to counter scams. Under this framework, the

Government can issue Code(s) of Practice requiring designated providers of online services to put in place systems, processes, and measures to proactively disrupt scams affecting people in Singapore. These include user verification measures to tackle e-commerce scams.

Beyond OCHA, we are also working closely with the banks, particularly to prevent scammers from gaining unauthorised access to victims' accounts. This includes ensuring that the banks' malware detection software remains effective against new malware strains, and that users are increasingly provided with more secure authentication methods.

That said, a vigilant public remains a key form of defence, as scammers will continually evolve their modus operandi. We will continue to educate the public and provide tools for individuals to protect themselves from scams.

The resilience and security of digital infrastructure and services is another important aspect that we are strongly focusing on. With more of Singapore's economic and social activities being digitalised, disruptions and outages in digital infrastructure and services can have far-reaching impact. The Government recognises the need to ensure that the digital infrastructure and services that we depend on are reliable, resilient, and secure. This will help our citizens and businesses move forward with confidence. As such, we have set up a multi-agency task force to look at this issue, to consider how we can strengthen not only the government's own digital infrastructure and services, but also other foundational infrastructure that our citizens rely on, such as cloud and data centres.

Through my mentors, I learnt to build teams, instead of trying to do it all; focus our energies on what matters most; and rally the people around us to move towards a common goal.

The 'Forward SG' report[2] talks about "using digital means to help seniors stay connected, thereby empowering them to access key services and communicate with loved ones via various channels". What would you say to those who are nervous about life with AI and living in a Smart Nation? How would you encourage them to be open to these technologies?

As you rightly mentioned, one of the key themes of the report is the use of digital means to help seniors stay connected, thereby empowering them to access key services and communicate with their loved ones via various channels. This is part of our broader vision to build a Smart Nation where we use technology to improve the lives and livelihoods of our people, and enhance our competitiveness and sustainability as a country.

I understand that some seniors may feel nervous or apprehensive about life with AI and living in a Smart Nation. They may worry about being left behind by the fast pace of technological change, or that we as a society lose the human touch. They may also have concerns about the security and privacy of their personal data, or the reliability and safety of digital systems and devices. These are valid and natural concerns, and we are committed to addressing them and supporting our seniors in their digital journey. Let me share with you some of the ways that we are doing so.

We are making digital services more user-friendly and inclusive. We adopt a human-centric and empathetic approach to designing and delivering digital services so that they are easy to use, thereby increasing accessibility for groups such as seniors. We have also provided various channels and platforms for our seniors to access digital services, such as the seven ServiceSG Centres located islandwide. These ServiceSG Centres can help the public to access close to 600 Government services and schemes. In 2023, about 400,000 transactions were completed at ServiceSG Centres, with one in four citizens receiving help on more than one service within the same visit.

Next, we are equipping our seniors to get up to speed in the digital domain. Established in June 2020, Digital Ambassadors from the SG Digital Office (SDO) provide personalised guidance to help seniors pick up basic digital skills. Currently SDO has 37 community hubs islandwide, along with over 200 mobile pop-up counters in workplaces, healthcare institutions, and community spaces. Beyond the Digital Ambassadors, some tech-savvy seniors also volunteer as Silver Infocomm Wellness Ambassadors to support their peers in embracing technology.

To better support our efforts to improve digital literacy among citizens, the Infocomm Media Development Authority (IMDA) has recently launched the Digital Skills for Life (DSL) framework in January 2024. DSL covers five competencies such as setting up and using smart devices; exploring information, communicating, and transacting online; as well as being safe, smart, and kind online. Based on the practical digital skills needed for daily living, there are also DSL guidebooks and online videos in the four official languages for seniors who may want to learn at their own pace, in their own time.

These are some of the ways that we are helping our seniors overcome their concerns and embrace living in a Smart Nation. We believe that by doing so, we can enable our seniors to stay connected, engaged, and empowered in the digital age.

As a leader, what have you found to be the most significant challenges and learnings in driving Singapore's Smart Nation journey? What advice would you give to young women (and men) aspiring to leadership roles in technology and government?

As working women, we often wear many hats. Through my mentors, I learnt to build teams, instead of trying to do it all; focus our energies on what matters most; and rally the people around us to move towards a common goal.

I also had great bosses who supported me on a very personal level. For example, in the months following the birth of my twins, my former boss Lee Yi Shyan, an ex-Member of Parliament (MP), gave me permission to work from home, long before telecommuting became a formalised policy and telecommunications infrastructure was mature. Throughout my working life, bosses like former MP Lim Swee Say and former senior civil servant Philip Yeo made room to accommodate my personal passions and circumstances.

One of my favourite quotes is: "Don't climb the ladder only to find that it is leaning against the wrong wall." I hope that even as we work towards our aspirations, we pace ourselves, take a step back every now and then, and not forget our priorities in life.

I also learnt about the intrinsic worth of every person, and what it takes to bring this out from reading 'The Rabbi's Gift'[3] by M. Scott Peck. This is a short story that I highly recommend and one that has been useful in shaping the way I think of myself as a leader. **AMI**

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is Singapore's Minister for Communications and Information, and Minister-in-charge of Smart Nation and Cybersecurity

Endnotes
1   *Char kway teow* is a stir-fried flat rice noodle dish commonly eaten in Singapore.
2   The report, which drew on inputs from Singaporeans from all walks of life, outlines how the Singapore government will work with citizens to refresh the country's social compact for the road ahead.
3   M. Scott Peck, 'The Rabbi's Gift' in "The Different Drum: Community Making and Peace", Simon and Schuster, 2010.