

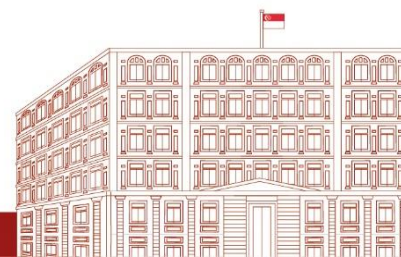
**Transcript of Speech delivered by Dr Janil Puthucheary,  
Senior Minister of State for Communications and Information,  
at MCI COS 2022 (4 Mar 2022)**

**MARKING OUR PLACE IN A DIGITAL WORLD**

1. Sir, I thank the various members for their cuts and questions and hope to address several of them in my response.
2. My colleagues have shared different facets of MCI's efforts to ready our ecosystems, businesses and people for a digital future:
  - i) Minister Josephine Teo spoke about how MCI will enhance digital regulations for digital safety, security and resilience, and deepening engagement with Singaporeans to strengthen social cohesion.
  - ii) Parliamentary Secretary Rahayu Mahzam shared about our continuing work to build a digitally ready and inclusive society, such as through NLB's Libraries and Archives Blueprint 2025, which is showcased in the main lobby of the Parliament.
  - iii) Minister of State Tan Kiat How spoke about our efforts to equip our workforce and enterprises with capabilities to seize opportunities in a digital and post-Covid economy.
3. I will focus on three areas where we are investing for the future, to mark Singapore's place in a digital world:
  - i) First, building digital infrastructure to meet our future needs.
  - ii) Second, pushing technological boundaries with leading edge innovation and research.
  - iii) Third, fostering international partnerships, to advance the Digital Economy and strengthen Digital Security, beyond our shores.

**Infrastructure**

4. Mr Shawn Huang and Ms Tin Pei Ling asked about MCI's plans to ready our infrastructure for the next wave of digitalisation.
5. The volume and complexity of digital traffic continue to grow very quickly.
  - i) We will increasingly rely on data and data-powered services, especially as cloud services and the Internet of Things (IoT) become more commonplace.



- ii) By 2025, the estimated amount of data generated globally, every day, is expected to reach 463 exabytes. That means 463 billion gigabytes, equivalent to roughly 60 hours of Netflix movies, per person daily.

6. How will we upgrade our digital infrastructure for a Data Age, so that it is fit-for-purpose and continues to support our needs?

### Wireless and Wired Networks

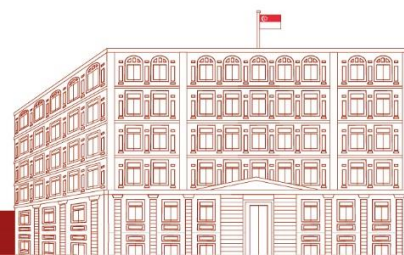
7. To begin with, we must pay attention to our domestic telecommunications infrastructure. These form our connectivity backbone. Wireless and wired network components such as base stations and fibre optic cables allow internet traffic to flow seamlessly in large volumes, providing a high-speed service to every corner of Singapore.

8. We have continued to upgrade our local telecommunications capability, for example through the shift to 5G. 5G technology enables unprecedented speeds and reduces latency. So more data can be transferred at higher speeds. 5G networks are also more responsive, and better able to cope with surges in data traffic.

- i) Here at Singapore, we continue to be at the forefront of 5G deployment. Our telcos stated that they have achieved 50% nationwide outdoor coverage at the start of 2022, ahead of their end-2022 target. We are on track for nationwide 5G coverage in Singapore by 2025.
- ii) The characteristics and advantages of 5G allow for new use cases, such as in advanced manufacturing. The Infocomm Media Development Authority (IMDA) has been partnering with IBM, Samsung, and M1 in Singapore's first 5G Industry 4.0 trial. The trial developed a 5G-enabled augmented reality (AR) solution in the form of AI-powered "Smart Glasses". These "Smart Glasses" assist factory operators in assembly and inspection, and also improve training efficiency for new hires by 50%. They will be deployed across IBM's global manufacturing sites from the second half of this year.
- iii) Traditionally, factory operators manually detect defects. This is a time-consuming process [that] relies on the human eye and is subject to fatigue. This 5G-enabled solution mitigates this. It overlays images and text onto physical objects, allowing inspectors to identify defects in real-time, augmented by this technological solution. It also allows the operators to take photos and use deep learning algorithms that identify images to quickly detect factory defects.

9. Apart from these wireless networks, we will also upgrade our wired networks. Already today, according to Internet metrics company Ookla, Singapore has one of the fastest broadband speeds in the world, and we can look forward to more.

- i) As mentioned by Minister Lawrence Wong in the Budget speech, we will invest in developing infrastructure to deliver broadband access speeds around 10 times faster compared to today, unlocking new possibilities for digital experiences and tools.



## Subsea Cables

10. The second category of infrastructure connects us to the world, such as satellites and subsea cables. These provide critical connectivity with international partners, and allows us to be part of international data flows and digital trade.

11. Singapore is already a digital connectivity hub, and a preferred landing site for global submarine cable operators, due to our stable governance and advanced economy. This connectivity enables the development of many different products and services, and supports many businesses that choose to locate important operations here in Singapore. It also allows our thriving research community to access computing resources from around the world, and for our data centres and supercomputers to serve international partners.

- i) We will continue to secure new landings, to strengthen our international connectivity.
- ii) For example, Singapore-based maritime company, BW Group, plans to develop a new submarine cable pathway connecting Singapore to the US via Indonesia, Australia, and New Zealand.

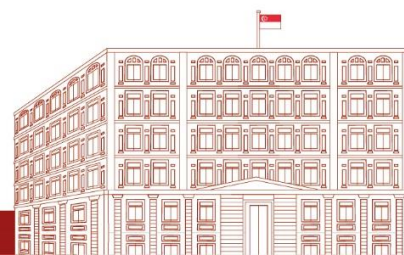
## Data Centres

12. The third category of infrastructure are data centres. These are vital nodes in the flow of digital traffic. Data centres power many applications and services for businesses and everyday life, from complex data management to e-commerce transactions.

- i) However, data centres are intensive users of water and electricity. Given our resource constraints, we need to manage the development of data centres sustainably.
- ii) IMDA and the Economic Development Board (EDB) will pilot a Call for Application to facilitate the calibrated growth of data centres that possess the best-in-class techniques, technologies and practices for energy efficiency and decarbonisation. Singapore is committed to fulfilling our environmental obligations under the 2015 Paris Agreement, and greener data centres will allow us to do so, while at the same time supporting the growing needs of our Digital Economy. The Call for Application will be launched by the second quarter of 2022.

## Digital Utilities

13. This comprehensive digital infrastructure, the various components that I have described, makes possible the provision of digital utilities. These are the services that ride atop the connectivity layers, that have become essential and commonplace, allowing people and businesses to use digital services, and transact seamlessly and safely. Minister of State Tan Kiat How shared examples earlier such as PayNow and InvoiceNow. Other examples include the National Digital Identity, Singpass and TradeTrust. We will continue to invest in other essential digital tools and services and develop them as digital utilities.



14. Another digital utility is the Singapore Trade Data Exchange (SGTraDex). Today, data is fragmented across the global supply chain ecosystem. With SG Tradex, supply chain ecosystem partners such as shippers and logistics providers are able to share trade data in a seamless and secure manner.

15. Ms Jessica Tan asked about SGTraDex progress. It has been good, with many companies across various sectors coming on board. The Government and the Alliance for Action for Supply Chain Digitalisation are working with these companies on a Minimum Viable Product, to allow more extensive data sharing and a live business environment, which will be launched later this year.

### **Digital Security for Our Infrastructure**

16. Our advanced infrastructure and highly used digital utilities can be vulnerable to attacks or risks of failure. I agree wholeheartedly with Ms Jessica Tan that we should ensure that our infrastructure is secure and resilient to address evolving threats and risks.

- i) Minister Josephine Teo had earlier shared on MCI's efforts to secure important digital infrastructure and services through our Cybersecurity Act.
- ii) MCI also adopts design principles to embed security features and operational practices within the system architecture, rather than to add these on at a later stage.

### **(A) Innovation**

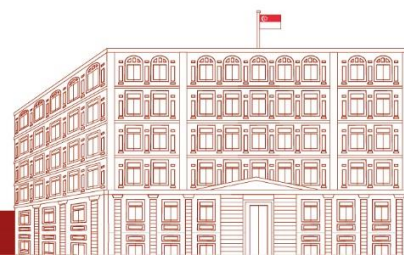
17. Mr Christopher de Souza, Mr Seah Kian Peng, and Mr Xie Yao Quan asked about the Government's investments in new digital technologies.

18. As part of the \$25 billion Research, Innovation and Enterprise (RIE) 2025 Plan, our plans for the Smart Nation and Digital Economy (SNDE) domain build on past investments to drive research in digital technologies with transformative potential.

### **Transformative Technologies - Quantum**

19. One such technology is quantum communication, which promises to revolutionise the security of our information and infrastructure.

- i) Today's encryption methods are mathematics-based. Hackers leverage sophisticated techniques and powerful computing hardware to 'crack the code'. As quantum computers mature, we can expect that adversaries will eventually be able to decrypt data and penetrate systems secured with today's technology, simply by applying more and more computing power.
- ii) Quantum communication is secured by physics-based methods, such as quantum key distribution (QKD). Potentially this can help to future-proof the security of our databases, critical systems, and communications. This technique allows the creation of paired secret cryptographic keys which are only held by the sender and the authorised receiver. Anyone



trying to intercept or copy the keys in between will introduce a detectable anomaly that the signals of the keys have been tampered with, and then, knowing that, we can re-transmit a new secure key in real-time.

- iii) If effective, this technique means that no amount of computational power, would be able to break quantum-secured communication.

20. It sounds a bit like science fiction, but quantum technologies have been developed in Singapore for over a decade. Since the Centre for Quantum Technologies (CQT) was established at the National University of Singapore in 2007, its researchers have contributed to 5,000 scientific papers, participated in projects supported by about S\$100 million in external grants, and established several start-ups here.

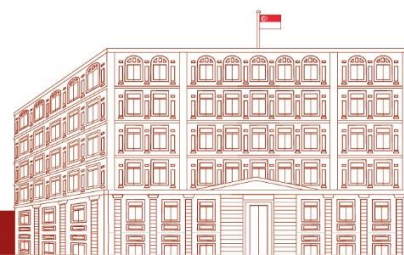
21. The Government continues to work closely with CQT to deploy quantum technologies in real-world applications.

- i) Two weeks ago, the National Quantum-Safe Network was announced. It is a public-private consortium that will deploy QKD-enabled wireless networks across Singapore.
- ii) One of the spin-offs from CQT, SpeQtral, is commercialising a satellite that will allow secure communication based on QKD technology, with support from EDB. When the satellite is launched and deployed into orbit, SpeQtral will be one of the first companies in the world to demonstrate a full commercial-scale solution.
- iii) I met CEO Lum Chune Yang and his team last month and was really impressed by how they have followed through from their pioneering research and experiments, and together with the many commercial partners they have already lined up, such as Toshiba, to then bring this to life and come up with a commercially deployable solution.

## Transformative Technologies – 6G

22. Quantum technology is just one area of future communications which we are developing. IMDA and the National Research Foundation are investing \$70 million in our first national Future Communications Research and Development Programme (FCP). The programme will accelerate the next bound of communications and connectivity research such as in 6G.

- i) The international research community recognises Singapore's strong innovation capabilities.
- ii) As part of the FCP, we signed an MOU with 6G Flagship in July last year. This is the world's first and leading 6G research and development programme funded by the Academy of Finland. Through this, parties will deepen research and development collaboration on 6G, such as through organising workshops, conducting joint research and educational projects between the researchers of both institutes.
- iii) And just two months ago, we signed another MOU with the Korean Institute of Communications and Information Sciences in the Republic of Korea.



## Translating Research to Tangible Benefits – AI

23. Other than investing in research, we are also strengthening research translation, so that companies and citizens can reap tangible benefits from these technologies today.

24. The Cybersecurity Industry Call for Innovation, by the Cybersecurity Agency of Singapore (CSA), enables companies to solve cybersecurity problem statements with innovative solutions.

- i) Under the Call, local cybersecurity company Flexxon developed X-PHY in 2021, which is the world's first Solid State Drive (SSD) embedded with Artificial Intelligence (AI) cybersecurity defence. The drive is powered by an AI co-processor and special firmware that provides real-time data protection against software attacks, such as malware, ransomware, and viruses; and physical attacks such as unauthorised cloning.
- ii) The X-PHY SSD continuously monitors itself without reading the stored files. When the drive detects tampering, it locks itself and alerts the owner. This user-friendly solution does not require complex configuration or constant updating.
- iii) Lenovo has already teamed up with Flexxon to use these SSDs in some of its laptops.

## (B) International

25. Sir, I have elaborated on Singapore's investment in future-ready digital infrastructure, and how we are breaking new ground with innovation. Let me turn now to how we are building on these efforts, together with international partners, for a secure and vibrant Digital Economy, connected to the world.

26. Ms Tin Pei Ling was interested in the new global opportunities, as well as challenges and risks in the digital domain. Issues such as cybersecurity, data protection and AI ethics are complex issues that transcend geographical boundaries. We cannot solve these problems alone.

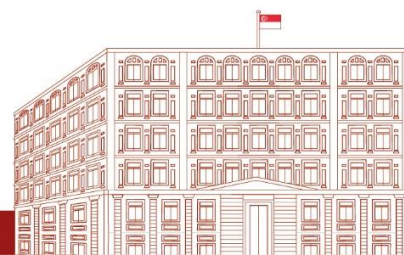
27. We need to build international consensus on rules, norms and standards, so that the digital ecosystem is sustainable, interoperable and protected against both accidental and intended harms.

- i) Members will be familiar with our Digital Economy Agreements (DEAs), which exemplify this approach. Singapore has signed DEAs with four countries, most recently with the UK last month. We have also substantially concluded a DEA with the Republic of Korea in December 2021.

28. Mr Seah Kian Peng will be glad to know that Singapore's work with our international stakeholders has been impactful and builds our global brand to be a trusted digital hub.

## Cybersecurity Partnerships

29. We have made significant contributions to the international cybersecurity community.



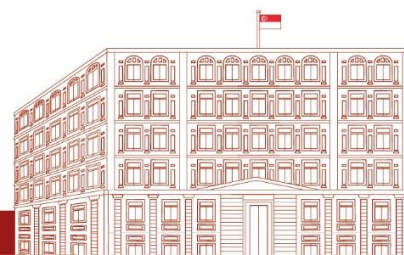
30. We have been able to do so, by drawing on our operational capabilities, technical expertise and innovation in cybersecurity; and bringing these together with balanced policy and regulatory perspectives. Critical to these efforts are the skilled and experienced cybersecurity personnel that represent us at many international discussions.

- i) Cybersecurity standards is one area where we are pushing ahead.
  - CSA launched the Cybersecurity Labelling Scheme (CLS) for consumer IoT devices in October 2020, the first of its kind in the Asia-Pacific at that time. It has garnered interest among our international partners, leading to an MOU with Finland for mutual recognition of cybersecurity labels.
  - CSA and Singapore Standards Council have also launched the first national standard, the Technical Reference (TR) 91, on Cybersecurity Labelling for consumer IoT. This standard can be adopted across the board by manufacturers, developers, testing bodies and suppliers of consumer IoT devices globally.
- ii) Since December 2021, Singapore has assumed chairmanship of the United Nations Open-Ended Working Group (OEWG) on Security of and in the Use of ICTs. This is the main international platform charged with international cybersecurity policy discussions. We are facilitating discussions to achieve consensus on norms, rules and principles, to advance a secure and interoperable cyberspace and encourage responsible State behaviour. Such efforts are all the more crucial, given the circumstances around the world.

### Data and AI Partnerships

31. Singapore has also made strong efforts to develop the interconnected data and AI ecosystems, striking a balance between data protection, data security and data innovation.

- i) We took the lead to develop the ASEAN Model Contractual Clauses for Cross Border Data Flows (MCCs), to enable enterprises to transfer personal data for business transactions across borders with regulatory certainty. We are pushing to expand the recognition of these clauses in jurisdictions outside of ASEAN.
- ii) In parallel, we are working to advance responsible AI deployment globally.
  - Building on Singapore's Model AI Governance Framework, we are partnering with countries including the US and the UK to learn from international best practices and align AI governance principles.
  - We are also working with ASEAN Member States to coordinate the development of an ASEAN Guide on AI Governance and Ethics. This will provide practical and implementable guidance to deploy AI responsibly, and foster consumer confidence to use AI-enabled services in the region more widely.



**(C) Closing**

32. Mr Chairman, I would like to conclude by emphasising the Government's commitment to building a digital future for Singapore that is economically vibrant, socially stable, safe and secure.

- i) Harnessing opportunities in digital while managing risks will be critical to our success and survival.
- ii) We are putting in place various building blocks with stakeholders, including digital capabilities, infrastructure, regulations, security, and investments for the future.
- iii) At the heart of the effort lies our people, their potential, and their wellbeing. We have to aim for all Singaporeans to be empowered and find fulfilment through their participation in the digital domain.

33. And together, we will build a vibrant and secure digital future together. Thank you.

