



SPEECH

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WELCOME ADDRESS BY MINISTER FOR DEFENCE, DR NG ENG HEN, AT THE OPENING CEREMONY OF THE INAUGURAL SINGAPORE DEFENCE TECHNOLOGY SUMMIT 2018, ON 27 JUN 18, 1900HRS, AT SHANGRI-LA HOTEL

Opening

Distinguished guests,
Ladies and Gentlemen,

1. Thank you for being here. Some three weeks ago, this room was packed with the Shangri-La Dialogue. It was a very different crowd. Let me just begin by saying that many organisations within Singapore have come together to host this meeting. These organisations have in common the belief that we need to promote the discovery and development of technologies that can better our societies and improve individual lives. Your presence here tonight affirms that belief. So on behalf of the Defence Science and Technology Agency (DSTA), in collaboration with the Ministry of Defence and the Ministry of Home Affairs, A*STAR, the Cyber Security Agency Singapore, the DSO National Laboratories, the Economic Development Board, GovTech, the National Research Foundation and the National Security Coordination Secretariat, I bid a warm welcome to all participants to this inaugural Singapore Defence Technology Summit, or Tech Summit. Thank you for being here.

Impetus of the Tech Summit

2. Many of you have flown in from different parts of the world, and we are very thankful for that. But if truth be told, there is no shortage of international conferences and meetings today. I know that many of you as leaders in government and academia, and experts in your various fields, turn down many invitations each year. There are defence exhibitions held regularly in various parts of the World, where commercial companies put significant investments into, such as the Singapore Air Show or the International Maritime Defence Exhibition and Conference (IMDEX), the naval equivalent for this region. There, participants get to see finished products or market prototypes that can modernise their militaries. There are also premier security dialogues such as the Munich Security Dialogue, the Manama Dialogue or the recently concluded 17th Shangri-La

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Dialogue – and it was a very satisfying dialogue because it saw a record of 50 countries and 40 Ministers participating from all corners of the world.

3. And it was the Shangri-La Dialogue, which gave inspiration to the organisers of this meeting, that perhaps an equivalent for defence technology is needed. But in this already overcrowded landscape of meetings and conventions, I should admit that the organisers for this Tech Summit did much soul-searching before deciding to host one more. That leaders of technology and government, especially those in security and defence, would want to meet is not intuitive at first blush. After all, would not the expected default for inventors, innovators, leaders of industry, or government officials be to advance your own domain expertise, hide your secrets and steal a march on your competitors? A few years ago, Netflix ran a series of documentaries entitled, *Genius*. I do not know how many of you watched it, but I happened to have some time, and Netflix is sometimes irresistible. It was riveting to watch life stories of inventors who guarded their secrets so closely and jealously – Colt vs Wesson for handguns, Edison vs Tesla, Jobs vs Gates and so forth. And yet, the very enthusiastic response to this Summit – with more than 400 “Tech Gurus” and leaders from industry and government from 17 countries, across a spread of disciplines – indicates that such an international tech summit fulfils a need of policy makers, armament chiefs, chief defence scientists, Chief Executive Officers (CEOs) and Chief Technology Officers (CTOs) from industry, academia and think tanks.

4. Why have leading lights of this generation of inventors, innovators, scientists and engineers not behave as their predecessors did, but chose instead to meet, discuss and compare notes? Let me just share three possible reasons. First, the pace of knowledge discovered or new applications developed has been rising at a phenomenal pace. Papers published are a very crude proxy but underscore this phenomenon. Over the last two decades, the numbers grew from 600,000 in 1996, to 1.5 million in 2006, and 2.3 million in 2016 — a four-fold increase over two decades. The chances of an isolated group succeeding in discovering or applying new technologies are slim. In game theory parlance, collaboration is the dominant strategy with greater pay-offs.

5. Second, new knowledge, which many of you here have discovered or pioneered, is already leading the world into terra incognita. Like contraception, electrical cables and computers before, artificial intelligence (AI) and big data will disrupt the way we work, live and even think. The old will give way to the new and inevitably pose moral dilemmas. Already many articles have been published on automation and robots that can perform increasingly complex tasks – what jobs will humans be left to do? Concerns such as these motivate you to meet and share, to try to shape the trajectory of this brave new world that you have helped create, to put order into the state of entropy to give a measure of predictability, if not meaning and purpose to ordinary lives.

6. There is a third, a prosaic but no less important reason, this Summit allows, I use this word very generally, “Techies” around the world to socialise, if not commiserate. Your extraordinary skills, insights and positions allow you to live in a world which is different from most and indeed intimidating to us ordinary folk – where comfort rather than fear is provided by complex mathematical formulas and theorems that produce weird science.

7. Whatever the motivations, we have assembled here in this meeting distinguished men and women who, through their ideas, inventions and leadership decisions, will shape tomorrow’s World, hopefully for the better. Many here are from the defence sector with modern platforms that wield devastatingly destructive power. In our less-than-Utopian world, we accept that military balance deters aggression. The events in Europe reaffirm this truism. Many European Union (EU)

countries, in reaping the supposed peace dividends at the end of the Cold War, reduced their military spending and cut back on research and development (R&D) for defence science. Defence industries laid off whole departments of scientists and engineers who had specific domain knowledge. Leaders today have recognised that this was short-sighted and are now seeking to restore the military balance by increasing investments into defence spending.

8. Apart from the military balance, R&D programmes in the defence arena have also produced commercial applications that improved the lives of society at large. The progenitor of today's Internet was the "ARPANET" in 1969, initially started as a United States (US) government's initiative to build a command and control network that would be resilient to nuclear attacks.

9. Today, huge investments into technology are made by both Government and Industry. Last year, private sector funding in R&D hit a record high of USD\$702 billion, in fact it exceeded government spending. The ratio of private to public R&D investments is now 2:1 in the US and Europe. In China, the ratio of private to public sector investments in R&D is 3:1. There is another shift too – in geography. Asian companies' R&D spending has more than quadrupled over the past decade. China now has the second largest R&D spending in the world. The discovery and application of new technology are shifting to new epi-centres from the US and Europe, to the Middle East and Asia.

10. With private sector involvement and a multipolar world for technology start-ups, the pace of discovery and application thereof, will likely quicken, with shorter development cycles. The Joint Strike Fighter Programme is a case-in-point, where Lockheed Martin is looking to employ an agile approach for software development, with new capability increments every six months - previously unthinkable.

11. Governments will increasingly look to commercial companies for solutions too. Already, many defence ministries, mine included, use commercial software as the default to run their human resource (HR) enterprise services. In China, the government is partnering Tencent to integrate WeChat with its electronic ID system. In Singapore, our DSTA and Original Equipment Manufacturers (OEMs), such as Airbus and Boeing, are collaborating in digital technologies such as 3D-printing and data analytics. Google, Microsoft and Amazon are aggressively offering cloud-based services to governments to reduce their costs in application and infrastructural investments.

12. The Singapore Armed Forces has also begun our journey into the employment of AI. For example, Unmanned Watch Towers (UWTs) watch over key installations here, like Jurong Island, a petrochemical hub. These UWTs combine inputs from a range of sensors, utilise machine learning to improve their ability to detect and identify threats, and cue operational responses. They augment our soldiers' functions.

13. These changes spell good news for the private sector but there are also risks and dilemmas to confront at this meeting. How do we ensure that new technologies do not undermine our collective security? Already, terrorists and their networks use encrypted messenger apps to orchestrate plots, as well as drones to conduct surveillance and deliver improvised explosive devices.

14. The ongoing discussion on data privacy violations by social media platforms is another example. Crowdsourcing is the key enabler in this new technology revolution – whether for assets such as bicycles and homes, or personal commodities such as money, time or data itself. Over-

regulation will cripple this new enabler and dissipate the power of aggregation. Can and how do we attain the golden mean between sharing and privacy? I also note that on the agenda of this meeting are discussions on the potential of AI and the ethical implications of machines replacing human decision-making. And I am glad that you as creators and leaders are also addressing this complex issue.

15. These are tough questions and moral dilemmas to address, with often no easy or cost-free answers. Let me give some examples of what Singapore is using to approach this regulatory conundrum. Underlying these examples is the use of technology itself.

16. The Monetary Authority of Singapore, Singapore's financial sector regulator, is actively test-bedding finance technology (FINTECH) solutions using controlled experiments in a virtual sandbox. For drones, we have demarcated One-North, a research and development hub in Buona Vista, as a sandbox environment to test unmanned aircraft solutions. Multiple parties from government, local universities, established overseas companies such as Airbus, and local industry players such as Singtel and Singapore Technologies (ST) Engineering Aerospace collaborate here on novel drone applications for parcel delivery, security checks and building inspections.

17. I started tonight's pre-dinner speech by asking if this Tech Summit was needed on the international circuit. Your presence here provides a strong affirmation. But it could be asked too, why does Singapore want to host this Tech Summit? Let me give my take. I believe that Singapore can play a useful role in this region and even globally as a place where progressive minds meet, where ideas flourish, and new paths are forged. We do not seek only to gather people who agree, but instead, through the contest of ideas and sharing of different perspectives, we hope to provide Singapore as a safe physical and intellectual haven where new possibilities abound and hope is renewed.

18. When Singapore was founded in 1965, we did not have the aspiration to be such a place. It would have been misplaced to think that far and aim that high when we were too poor with many communal problems, even existential challenges to solve. Even as Singapore developed, we did not proffer ourselves as a venue for historic meetings that have been held here – whether it was the 1993 Wang-Koo cross-strait talk, the 2015 meeting between Xi Jinping and Ma Ying-jeou and the recent Trump-Kim Summit. But if we can play that small role to advance the cause of peace and enable progress in humanity, then Singapore ought to do it and do it well. I hope that this Tech Summit can play a role in helping all countries deal with the many blessings as well as challenges that technological disruptions will bring in their wake.

19. I am particularly pleased that we have representatives from many countries. Just as no single group will be effective in providing solutions, so too must our countries work together to enhance our collective security and the well-being of our people.

Conclusion

20. Once again, I want to thank all of you speakers, delegates and sponsors for your presence and support to this inaugural Tech Summit. I look forward to meeting you individually and wish everyone an enjoyable dinner and fruitful summit ahead. Thank you very much.

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