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Speech by 2M Tan See Leng at the National Robotics Programme 6th Anniversary Event and Launch of the Aerial Arena

Prof Quek Tong Boon, Chief Executive, National Robotics Programme, Prof Phoon Kok Kwang, Provost, Singapore University of Technology and Design (SUTD), Mr Alvin Tan, Minister of State, Ministry of Trade and Industry Distinguished guests, Ladies and gentlemen,

Introduction

1. Good afternoon. I'm very happy to be here this afternoon, at the 6th Anniversary celebration of the National Robotics Programme (NRP), and the launch of the Aerial Arena.

2. Frankly I was quite inspired by the Chief Executive's speech. This is the sixth NRP event and I hope that by the seventh NRP event, the Guest-of-Honour will be a robot and the ChatGPT would have gone up to a different level.

3. Let me take this opportunity to share on three aspects of robotics in Singapore.

a. First, the NRP's efforts to develop the robotics industry.

b. Second, the significant benefits to society that robotics has enabled in Singapore.

c. Third, the importance of continued collaboration and partnerships to strengthen the robotics ecosystem.

Strengthening our robotics ecosystem and deepening our robotics capabilities

4. Robotics is a significant growth area for Singapore, and we see many industry sectors increasingly adopting robotics solutions to enhance productivity, safety, and quality^[1].

5. Today, there are over 200^[2] robotics companies in Singapore, including 80 startups, nine of which spun off from NRP projects. One of these spinoffs, LionsBot, is starting to make its mark on the global stage. Since its founding in 2018, it has sold over 1,500 of its made-in-Singapore professional cleaning robots to about 30 countries.

6. To enable more success stories like LionsBot, Singapore will continue to strengthen the local robotics ecosystem and invest in developing robotics capabilities.

7. Since its inception, NRP has played a strong role in catalysing and developing the local robotics ecosystem. NRP's projects have generated knowledge that has established Singapore in the global robotics research community, and capabilities that have benefitted many of our companies. These projects have also trained and engaged more than 700 research scientists, engineers, and professionals in Singapore.

8. These successes are made possible by a whole-of-government approach where NRP serves as a national platform that develops end-to-end robotics enablers and differentiated solutions in Singapore. It brings together research capabilities from A*STAR research institutes and local institutes of higher learning to tackle national challenges using robotics and automation. It also funds R&D and partners Government agencies such as A*STAR, EDB and EnterpriseSG to translate ideas to products and solutions for commercial outcomes, and increases and improves socio-economic impact.

Significant benefits to society from Singapore's investment in robotics R&D

9. This brings me to my second point, which is that Singapore's investments in robotics R&D have created significant benefits for our society. Our robotics ecosystem today offers a range of both hardware and software technologies, intellectual property and human talent. From this ready pool, we developed and deployed robotics in our fight against COVID-19 over the last three years.

10. To protect our frontline workers, robots performed tasks like transferring patients, monitoring patients' vital signs and delivering medication^[3]. We were able to multiply our diagnostics testing capacity to cope with surges in demand.

11. For example, a robotics solution was catalysed through a collaboration involving NRP, the Changi General Hospital (CGH)'s Centre for Healthcare Assistive & Robotics Technology (or CHART for short), and some companies. It enables robots from different vendors to interoperate among themselves across different scenarios. Otherwise, for example, if a robot transporting a sick patient and a robot delivering linen reach a lift lobby at the same time, how would they know which robot gets priority to enter the lift?

a. Known as the Robotics Middleware Framework for Healthcare^[4], this platform also allows robots to communicate with building infrastructure to deconflict tasks, and function safely and effectively. During the pandemic, we successfully deployed it at some of our COVID-19 treatment facilities.

12. Another example of how robotics has created impact can be found in our environmental services sector. Many of us may be familiar with Project Wolbachia. This initiative, led by the National Environment Agency (NEA), fights dengue transmission by releasing the male *Wolbachia* bacteria-carrying mosquitoes into the environment. When these male mosquitoes, which do not bite nor transmit disease, mate with the female ones that cause dengue, their eggs do not hatch^[5].

a. Robotics and automation were used to scale up the production of the male *Wolbachia* bacteria-carrying mosquitoes to support expansion into more neighbourhoods. With funding support from NRP, local SME Orinno Technology and NEA managed to increase the capacity and production of the male *Wolbachia-Aedes* mosquitoes from two million to five million mosquitoes a week.

13. Besides societal level impact, we are also seeing robotics making a difference to individuals.

a. For 19-year-old Muhammad Sayfullah, a young man with cerebral palsy, driving a powered wheelchair by himself can be a difficult and almost insurmountable task. His mother, Mdm Fadillah, shared how he would knock into the cardboard boxes when trying to drive a powered wheelchair on an obstacle course.

b. So imagine the joy she felt when Sayfullah tried the same course on a smart robotics wheelchair with AI algorithms to correct imprecise joystick controls, and obstacle avoidance features. She was incredibly surprised that he managed to navigate smoothly even through narrow passageways and uneven terrains.

14. I would like to commend the Rehabilitation Research Institute of Singapore at NTU for their work on the smart wheelchairs, another NRP-catalysed project. These examples show how robotics play an integral role in our lives, and why it is important to continue to strengthen our R&D capabilities, and to continue to nurture talent and build infrastructure in this area.

Collaboration is key to ensuring Singapore's competitiveness in robotics

15. My third and final point: The key to ensuring Singapore's competitiveness in robotics is collaboration. Public sector agencies, institutes of higher learning, research institutes and our private sector must continue to come together to collaborate, co-innovate and translate robotics R&D into solutions and real-world applications.

16. In this regard, I am pleased to witness today three further developments in NRP's effort to enhance the robotics ecosystem in Singapore.

a) First, the launch of the Aerial Arena, which was developed originally as a facility to support the testing of an SUTD robotics project funded by NRP. While SUTD is located in a "no-fly zone" due to its close proximity to Changi Airport, the Aerial Arena at SUTD will be able to support the flight-testing of drones and open air testing of other technologies that require three-dimensional space. In so doing, this netted-outdoor facility is designed to overcome the constraints of Singapore's limited airspace. I am confident that the Aerial Arena will contribute to Singapore's efforts to accelerate the development and use of drones. I want to set a challenge to our NRP colleagues here. Set up the drones with such solid AI algorithms and analytics so that we can use the drones to supervise worksite safety. As Manpower Minister, trust me, we will get NRF to fund some of these projects and co-develop them with you.

b) Second, SUTD and its incubated start-up Spinoff Robotics, will sign an MOU with Gardens By The Bay today to leverage aerial robotics technologies for horticultural and landscape maintenance in elevated areas such as the Gardens' Supertrees. The collaboration will see the use of drones to facilitate the cleaning of plants on the 18 vertical gardens. This not only reduces the need for staff to work at height, but also saves on manpower, allowing resources to be deployed more efficiently and providing opportunities for staff to be upskilled.

17. I am also pleased to announce the launch of Technical Reference 108, or TR108.

a. TR108 provides recommendations and requirements at the system level for the deployment of robot systems in the healthcare sector. It specifies a safety evaluation framework and risk assessment requirement for the sustainable deployment of robot systems in dynamic environments. Standards like this help accelerate the deployment of robotics solutions, by enabling developers and manufacturers to build products that are interoperable.

18. My appreciation goes to NRP, MOH, CGH, CHART, EnterpriseSG, as well as our international partners and domain experts in Japan who have worked on the development of this standard. I look forward to its adoption to enable the scaling of a sustainable robotics ecosystem in Singapore and beyond.

Conclusion

19. To conclude, I would like to congratulate NRP on its 6th anniversary and the success it has achieved thus far.

20. I look forward to seeing even more exciting outcomes in the years to come, as it continues to orchestrate our robotics ecosystem and catalyse the development of robotics capabilities for Singapore.

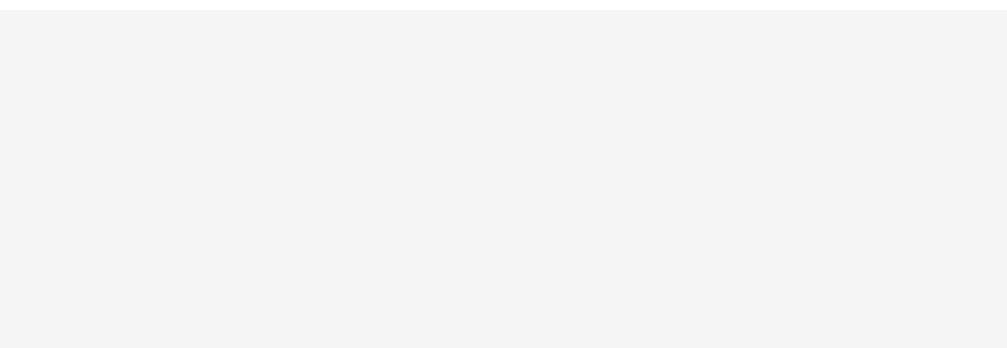
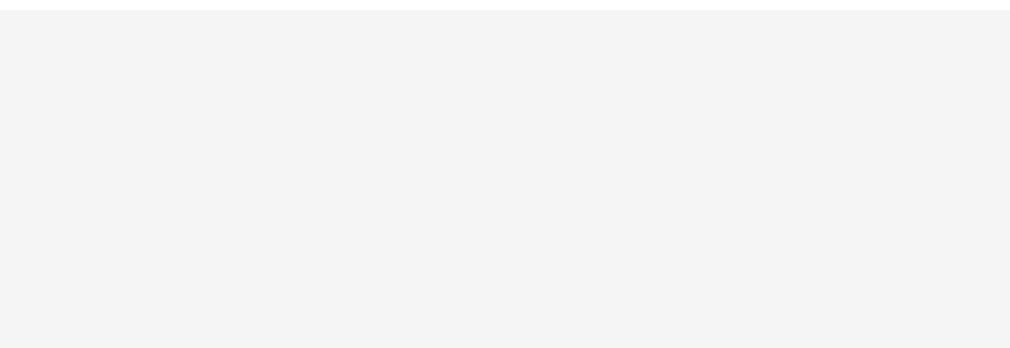
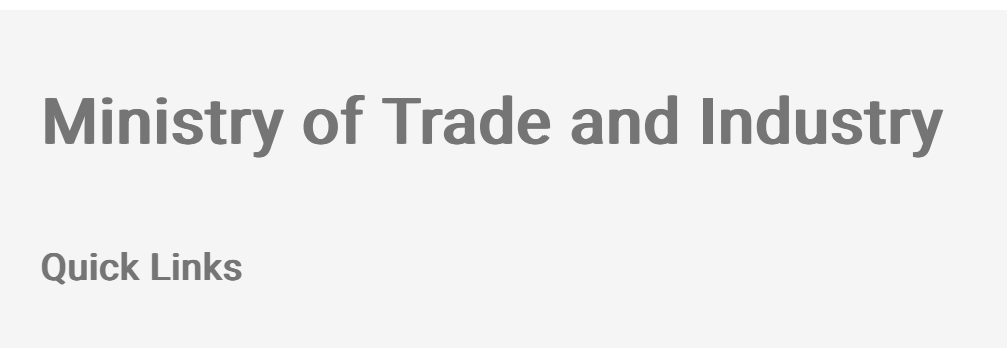
21. Thank you.

^[1] Source: National Robotics Programme Overview ([nrp.gov.sg](#))
^[2] Tabulated by NRP with inputs from EDB and ESG.
^[3] Source: Embracing innovative tech and robots in healthcare: [https://www.singhealth.com.sg/news/singapore-health/embracing-innovative-tech-and-robots-in-healthcare](#)
^[4] Note: Min MOH announced the development of Romi-H in 2017: Speech by Mr Gan Kim Yong, Minister for Health, at the National Health IT Summit 2017: [https://www.moh.gov.sg/news-highlights/details/speech-by-mr-gan-kim-yong-minister-for-health-at-the-national-health-it-summit-2017-30-may-2017](#)
^[5] Source: CNA Explains: Singapore ramps up Wolbachia mosquito project: [https://www.channelnewsasia.com/singapore/nea-wolbachia-mosquito-project-how-it-works-dengue-cna-explains-2769711](#)

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