SINGAPORE DEFENCE TECHNOLOGY SUMMIT

12-15 October 2021

BUILDING CONFIDENCE AMIDST TECHNOLOGY DISRUPTION

CONTENTS

Keynote Address
by **Mr Heng Swee Keat**, Deputy Prime Minister and Coordinating Minister for Economic Policies (Singapore)

Welcome Address
by **Dr Ng Eng Hen**, Minister for Defence (Singapore)

One-On-One Dialogue

Plenaries:
- Tackling Disruptions: Questioning Your Assumptions
- Beyond Terrorism, Cyber and Pandemics: What's Next?
- The Government-Industrial Ecosystem: Turning Challenge into Opportunity

Summary Plenary

Virtual Platform

Engagements

Virtual Technology Sharing and Demo Sessions

Tech Summit on Social Media

Testimonials

KEYNOTE ADDRESS BY MR HENG SWEE KEAT

Deputy Prime Minister and Coordinating Minister for Economic Policies (Singapore)

EXCERPTS

"Dual Use as a Two-Way Street"

"The defence sector has always placed great emphasis on technology and innovation. It is a key force multiplier, allowing armed forces around the world to do more with less….But increasingly, the defence sector will also have to harness the innovative capacity of the private sector....In many key technologies that will reshape the world, such as Artificial Intelligence (AI), internet-of-things, 5G or even 6G – the private sector is now leading the way.…To fully harness the potential of the private sector, the defence sector will need to find new ways of working. We will need clear criteria in deciding when to buy and adapt, and when to invest and develop in-house. We will also need new private-partnership models to harness such innovations."

Whole-of-Nation Effort to Deal with Asymmetric Threats

"With increasing digital connectivity and the internet-of-things becoming more pervasive in daily living, cyberspace has become the new frontier for potential 'grey zone' conflicts. In many ways, a cyberattack on a country's energy grid, utility networks and communications systems could disrupt lives and the economy as much as traditional methods of warfare. Yet at the same time, the barriers to access are very low….To address these threats, we need a 'whole-of-nation' effort – involving private businesses, the research community, and individuals….Cyber threats do not respect national boundaries. So nations need to collaborate, to develop international norms and frameworks in tandem with technological innovations."

Building Adaptive Capacity and Resilience to Disruptions

"COVID-19 has given the world a wake-up call that we must prepare far better for disruptions.... It has also exposed fragilities in many other aspects of how the world is organised….We will need more innovative ways to build adaptive capacity in the defence ecosystem. One way is to partner with civilian operators and learn from cutting-edge practices that leverage technology to build supply chain resilience....Additive manufacturing can also provide another source of adaptive capacity.…We must be realistic that it is not possible to anticipate all sources of potential disruption. But by enhancing our adaptive capacity, staying nimble and working together, we can be more resilient to disruptions."

Importance of Collaboration and Partnerships

"Militaries will need to continue to partner the defence industry to drive disruptive military innovation. At the same time, the defence ecosystem will need to extend cooperation beyond its traditional partners. This will require the defence community to work more closely with private companies and the research community….To address these threats, we should build greater trust and confidence, and strengthen partnerships."

WELCOME ADDRESS BY DR NG ENG HEN

Minister for Defence (Singapore)

Relevance of the Tech Summit Amidst Today's Conflict Landscape

"It is axiomatic that technology and science are neutral – humans start wars, not technologies. But all of us here would agree that technology, either its application or its availability, has inevitably shaped the conduct and outcomes of battles….I think this leads to the more relevant question: What role do defence technology leaders play in conflicts, either in its prosecution or prevention?....This Technology Summit therefore seeks to give leaders and practitioners in defence technology a louder voice in shaping our future, and where possible, to prevent conflicts or at least to mitigate the loss of civilian if not military lives....To achieve that goal, there must be partnerships and consensus among friends and allies and even, perhaps especially, among those who disagree."

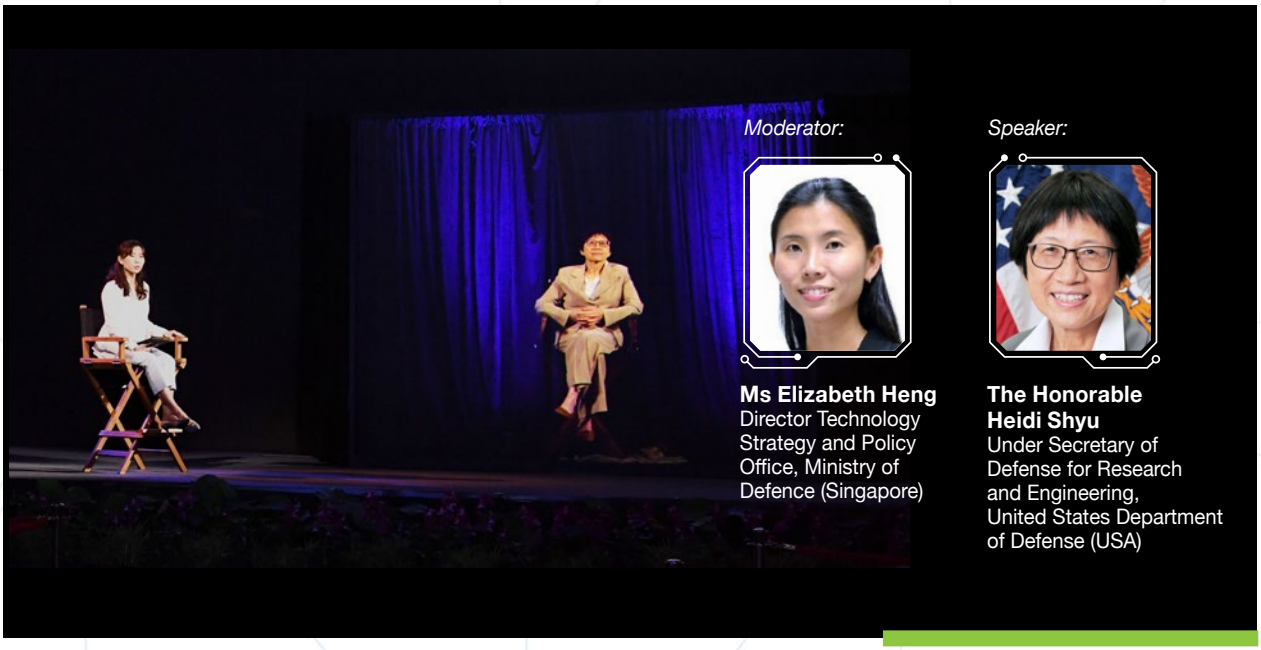
Threats and Responses

"The digital domain is a contested battle space….Attacks in the digital battlefield pose a growing threat that can easily spill over, explode and wreck unintended havoc on the rest of society....The scale, scope and frequency of cyberattacks are expected to rise, with non-state actors increasingly conducting attacks enabled by cyber and informational tools such as malware, ransomware, misinformation, disinformation and influence campaigns against private corporations and governments….Just as in the kinetic world, the digital domain must move from an unfettered, no-rules based, 'who dares, wins' architecture to one that prevents, at the very least, high-stakes catastrophes and disruption to civilian life. As the number of private and state actors in space grow, space can become a militarised zone and strategic miscalculations and inadvertent escalations can ensue. Autonomous technologies and AI would be the third big area to discuss. Militaries, like other civilian organisations, want to exploit the potential of AI to deal with complex and voluminous data amid the fog of war, and make better and faster decisions….What safeguards are needed, to be built in AI systems for robustness and accountability?"

Building Partnerships and Inter-Agency Collaboration

"Our search for stabilisers in this age of technological disruptions must necessarily involve partnerships. Countries need to come together to develop frameworks to guide behaviour and outcomes in digital, cyber, AI and other emerging domains. We should continue to support ongoing efforts at the United Nations (UN) to develop frameworks – whether on the application of international law, or fostering of norms and principles – to strengthen international order.…Outside the UN, states can also pursue multilateral arrangements to address collective challenges. One such challenge is the risk of irresponsible use of AI in military applications….Just as the kinetic services of air, land, and sea conduct exercises to enhance interoperability, build mutual confidence and understanding, their non-kinetic counterparts must follow suit."

ONE-ON-ONE DIALOGUE



Moderator:

Ms Elizabeth Heng
Director Technology Strategy and Policy Office, Ministry of Defence (Singapore)

Speaker:

The Honorable Heidi Shyu
Under Secretary of Defense for Research and Engineering, United States Department of Defense (USA)

The one-on-one dialogue with Ms Shyu offered insights into the US Department of Defense (DoD)'s strategies to embrace technological disruptions and move forward rapidly.

Harnessing Commercial Technology

Ms Shyu opined that the US armed forces was facing increasingly diverse and complex challenges ranging from sophisticated cyberattacks, supply chain risks and hypersonic missiles to biological threats. To overcome these challenges, the US DoD had to harness the innovation ecosystem globally to stay ahead of its potential adversaries. Ms Shyu shared that the US DoD was accelerating the incorporation of commercial technological innovations and taking a nimbler approach to field new warfighting capabilities more rapidly. The US DoD had also established a new Rapid Defense Experimentation Reserve (RDER) initiative to identify critical capability gaps, collaborate with the industry to ideate and co-create solutions, select the best solutions for rapid prototyping and experimentation, and to transit these solutions into operational capabilities.

Teamwork and Partnerships

To overcome disruptive threats, Ms Shyu emphasised that one of the key success factors was teamwork. She highlighted the need to increase collaboration at all levels across the ecosystem – partners, commercial sector and academia – to develop capabilities and to build a foundation of future-ready workforce. She underlined the need to find common cooperative opportunities with like-minded partners on joint research and developments, share best practices, and improve cost-effectiveness and interoperability. Ms Shyu shared that the US DoD had also planted the Defense Innovation Unit in the Silicon Valley to work closely with the industry to seek dual-use technologies that match the Services' needs. In addition, she highlighted the need to create opportunities for partners to come on board, citing examples such as the industry day organised by the US DoD for businesses and researchers to pitch their ideas, and to actively engage the C-suites on the US DoD's strategy.

Building a Talent Pipeline

Highlighting the importance of building a talent pool for the DoD's laboratories, Ms Shyu shared that the US DoD was providing over 400 Science, Technology, Engineering and Mathematics undergraduate and postgraduate scholarships annually. In addition, the US DoD was also funding research and development in universities to establish Centres of Excellence in critical technological areas.

Mindset Shifts to Stay Ahead

Ms Shyu concluded that a mindset shift was needed in the defence ecosystem, from the traditional linear process of system acquisition and development, to one that nimbly sought out iterative capability improvements through rapid prototyping and experimentation in order to stay ahead of disruptions.

PLENARY 1 –
TACKLING DISRUPTIONS: QUESTIONING YOUR ASSUMPTIONS

Focus Areas for Defence Establishments

Dr Roper opened the session by asking what would the panellists' focus areas be if they were the defence minister. For Prof Monro, her top concerns were on digital disruption given its increasing complexities and cyber vulnerabilities, and the paradigm shift to defend against attacks from low-cost autonomous systems, disinformation and trust erosion. Mr Salm and Dr Reddy shared concerns on having skilled manpower, seamless interoperability, miniaturisation and the ability to deliver capabilities in shorter timeframes. Dr McFate suggested to focus on institutional cultures as "war changes before warriors do".

"Sneaky" Warfare

Dr McFate opined that wars were becoming "sneakier" and would be waged under the cover of plausible deniability. Dr Roper agreed and predicted that governments would invest increasingly in domains that would be difficult to see and attribute, such as cyber, space, undersea and potentially biology. To address such hybrid threats, Mr Salm suggested the spotlight be shone on the issue via transparency and to take an internationally unified stance against threat actors. The panel also discussed that most of such warfare would never come to light in the public domain, and governments would need to change the ways they obtain population buy-in and establish trust for greater resilience against "sneaky" warfare.

Conventional ("Un-sneaky") Warfare

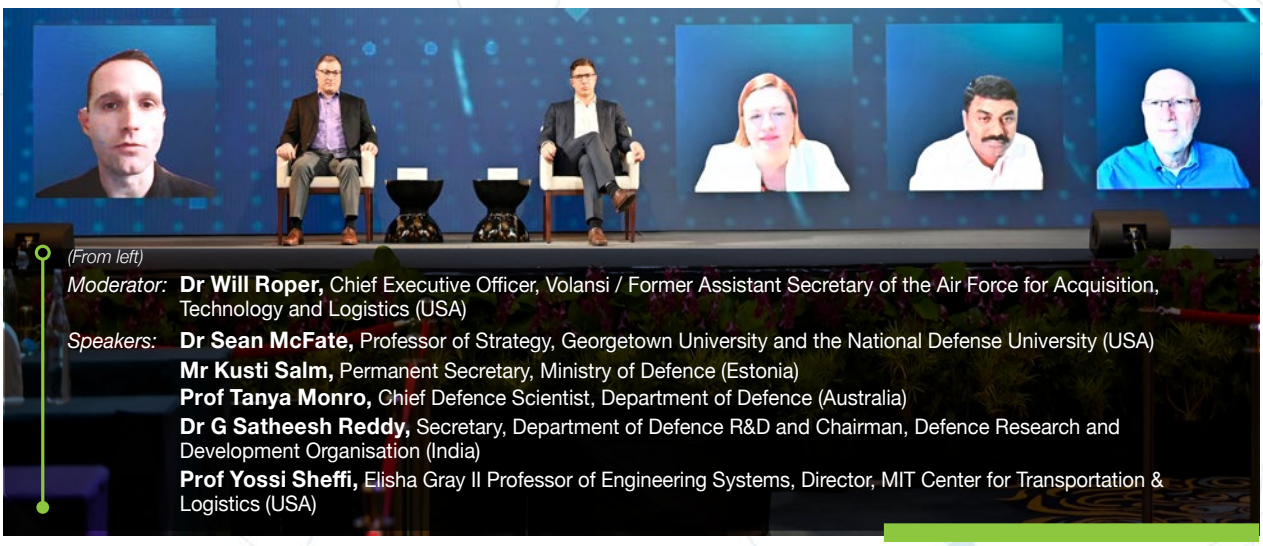
Dr Roper predicted that governments would rely increasingly on commercial technologies, autonomy and AI to provide new ways to fight the conventional war more cost effectively. He also shared his view that human-AI interoperability would be a key technology enabler to address AI vulnerabilities. Dr Reddy and Prof Monro highlighted the need to address potential ethical risks by having stronger education and the development of ethical AI frameworks.

Biology as a Strategic Weapon?

Dr Roper questioned whether biology would become a new strategic weapon. Dr McFate said that biology was not traditionally seen as a weapon due to its unpredictability in spread and mutations. Prof Sheffi countered that non-state actors would not be concerned about repercussions, and might use a super-COVID bug if they could attain it. Dr Reddy responded on the need for countries to establish clear safety norms and invest in early detection and protection capabilities.

The Need for Agility and Talent

Dr Roper posited that the future battlefield would likely be won by those with the most agile system as there would be many technologies that could be weaponised. Prof Monro highlighted the need to expose warfighters to potential disruptive technologies earlier, not only to trial them but also to influence the warfighting culture. Dr Roper suggested leveraging digital engineering and advanced manufacturing to enable an agile R&D process. The panellists also shared the view that talent was key to tackling disruptions, and governments would need to approach this differently from before. Mr Salm opined that AI and autonomy could be used strategically to employ talents more productively.



(From left)

Moderator: **Dr Will Roper,** Chief Executive Officer, Volansi / Former Assistant Secretary of the Air Force for Acquisition, Technology and Logistics (USA)

Speakers: **Dr Sean McFate,** Professor of Strategy, Georgetown University and the National Defense University (USA)

Mr Kusti Salm, Permanent Secretary, Ministry of Defence (Estonia)

Prof Tanya Monro, Chief Defence Scientist, Department of Defence (Australia)

Dr G Satheesh Reddy, Secretary, Department of Defence R&D and Chairman, Defence Research and Development Organisation (India)

Prof Yossi Sheffi, Elisha Gray II Professor of Engineering Systems, Director, MIT Center for Transportation & Logistics (USA)

PLENARY 2 –
BEYOND TERRORISM, CYBER AND PANDEMICS: WHAT'S NEXT?

(From left)
Moderator:
BG David Neo, Deputy Secretary (Technology) and Future Systems & Technology Architect, Ministry of Defence (Singapore)
Speakers:
- **Dr Irit Idan,** Executive Vice President for Research and Development, Rafael Advanced Defense Systems (Israel)
- **Dr Emmanuel Chiva,** Director, Defence Innovation Agency (France)
- **Dr Hao Li,** Chief Executive Officer and Co-Founder, Pinscreen (USA)
- **Mr Mike Sewart,** Group Chief Technology Officer, QinetiQ (UK)

What Keeps You Awake at Night

BG Neo opened the session by asking each panellist what kept them awake at night. Mr Sewart shared his concerns about grey zone disruptions, including information operations, covert operations and cyber-attacks. He emphasised the need to build cyber resilience, develop solutions to ensure data integrity, and nurture the ability to adapt more rapidly. Dr Chiva shared his fear of missing out on the next technology revolution that the adversary might harness. He elaborated on the French Defence Innovation Lab's approach to harness innovation by actively "fishing" for useful commercial technologies, and publishing challenging defence problems to "hunt" for industry proposals.

Fragility of Trust in Digital Domain

Dr Li impressed on the audience the fragility of trust in the digital domain – that the general public relied heavily on – by sharing about the advances in deepfake technology. Citing a demonstration using real time face-swapping in videos, he highlighted that such technology was becoming increasingly accessible and harder to detect due to its realism. He reminded technologists of their responsibility to consider not only the useful applications of their creations – such as entertainment – but also the potential consequences of misuse, including impersonation and misinformation.

Emergence of Transdisciplinary Technology

Dr Idan shared her vision that the next disruptors would be transdisciplinary technologies such as quantum computing for AI applications, bio-convergence which fuses life sciences with data science, engineering, and nano-technology for health-tech applications. She shared that the huge amount of data produced daily was restrained by data processing capacity, and the industry was now in a tight race to create the next viable computer. She believed that quantum and neuromorphic computing would open up new AI possibilities.

Embracing the Unpredictable Future

The panel concluded that it was impossible to predict the future, hence there was a need to embrace change and its challenges. Several key strategies were put forth. First, the need for a mindset shift towards change to enable agility with rapid acquisition processes and quick planning-to-test cycles, as well as the utilisation of red teams to challenge conventional thinking. Second, it was important to build an ecosystem of collaboration with academia, commercial sectors and allies. Third, it was necessary to enable military platforms with typically long lifespans to adopt new technology upgrades via modular and open architectures. Closing the session, BG Neo shared on a possible twist in the well-known tortoise and hare story to highlight the importance of mindset change and collaboration.

> ***Excerpt:***
> *BG Neo: "[on the tortoise and hare story] I think we got it wrong. All this while we had a problem, and we were trying to challenge and fight one another to see who could be faster…, What if the goal is not to see who can run faster, but to see how fast can we run together?"*

PLENARY 3 –
THE GOVERNMENT-INDUSTRIAL ECOSYSTEM: TURNING CHALLENGE INTO OPPORTUNITY

Partnerships

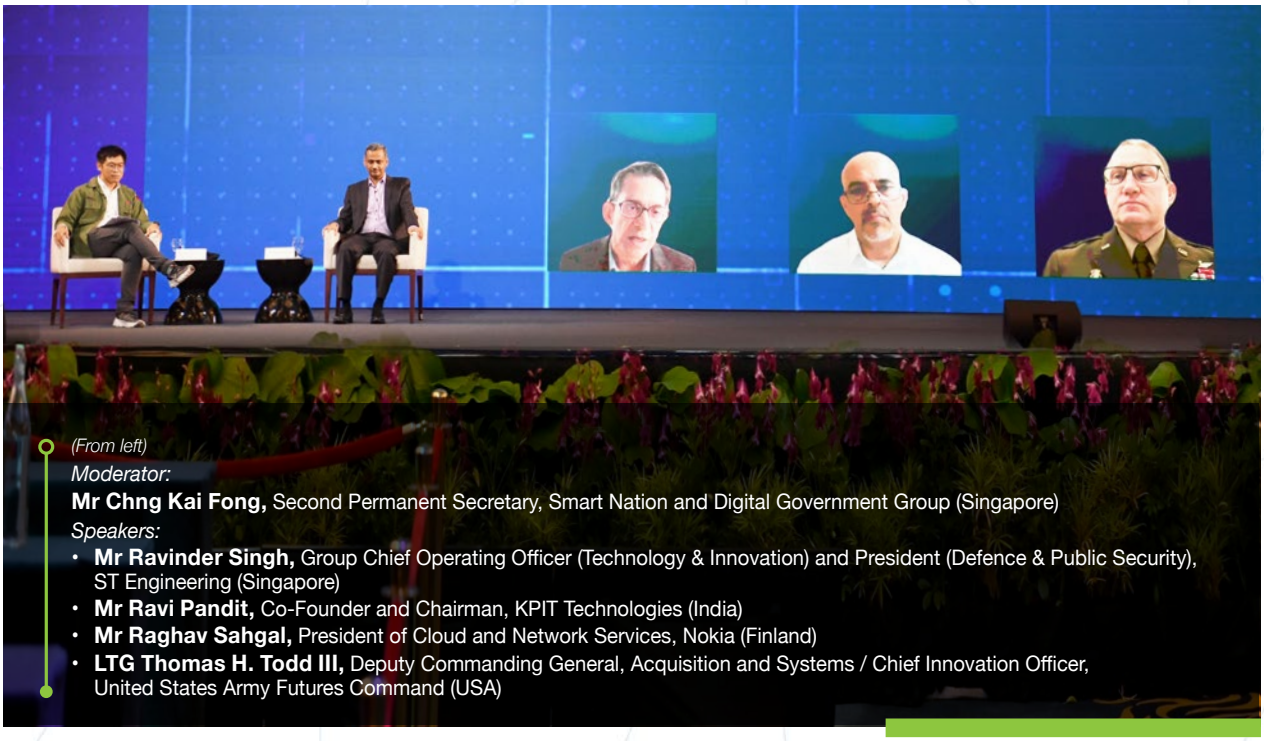
Mr Chng kicked off the plenary with the observation that governments were lagging behind in terms of technology adoption, and questioned how defence establishments could continue to keep pace and partner the industry. Sharing the perspective of a defence company, Mr Singh said that ST Engineering needed to provide the traditional qualities of security, reliability and robustness, yet at the same time inject innovation, agility and digital technologies into their systems. To achieve this dichotomy, he shared that leaders should be exposed to technology possibilities from the commercial world, and shared the process of acquiring an AI start-up to learn their techniques, and eventually dovetail such technologies into mainstream engineering solutions in its core business units. Mr Sahgal and Mr Chng also discussed the importance for Nokia – as a technology provider – to work in partnership with governments and local Original Equipment Manufacturers to design and co-create tailored solutions for the defence sector. Mr Sahgal shared that a key enabler of such partnerships would be how governments transform the relationship from a transactional vendor to one of a trusted partner.

Accelerating Innovation

In response to the complex and dynamic defence challenges, the panellists highlighted that it was necessary to accelerate innovation and experimentation. Lt Gen Todd shared that the US Army Futures Command is located in Austin, Texas, to tap its dynamic commercial sector and start-up environment. The co-location enabled new partnerships whereby the Army Futures Command's laboratories and traditional defence partners could share problem sets with, and absorb solutions from innovators and start-ups as part of collective experimentation. He shared the benefits of forming cross-domain technical and operational teams, and providing them the autonomy to move away from the traditional serial process of solutioning based on a prescriptive set of requirements.

Change Mindset

Mr Pandit shared that KPIT saw itself as a disruptor, and the best way to manage change would be to drive it. Responding to Mr Chng's query on how KPIT kept itself ahead of the game, Mr Pandit said that innovation had to be part of the organisational strategy, culture and passion. He elaborated on KPIT's structured process of continuously forecasting changes from the near horizon to the next 10 years, to identify priority work areas from there. KPIT would then invest heavily in R&D to develop these areas further.



(From left)

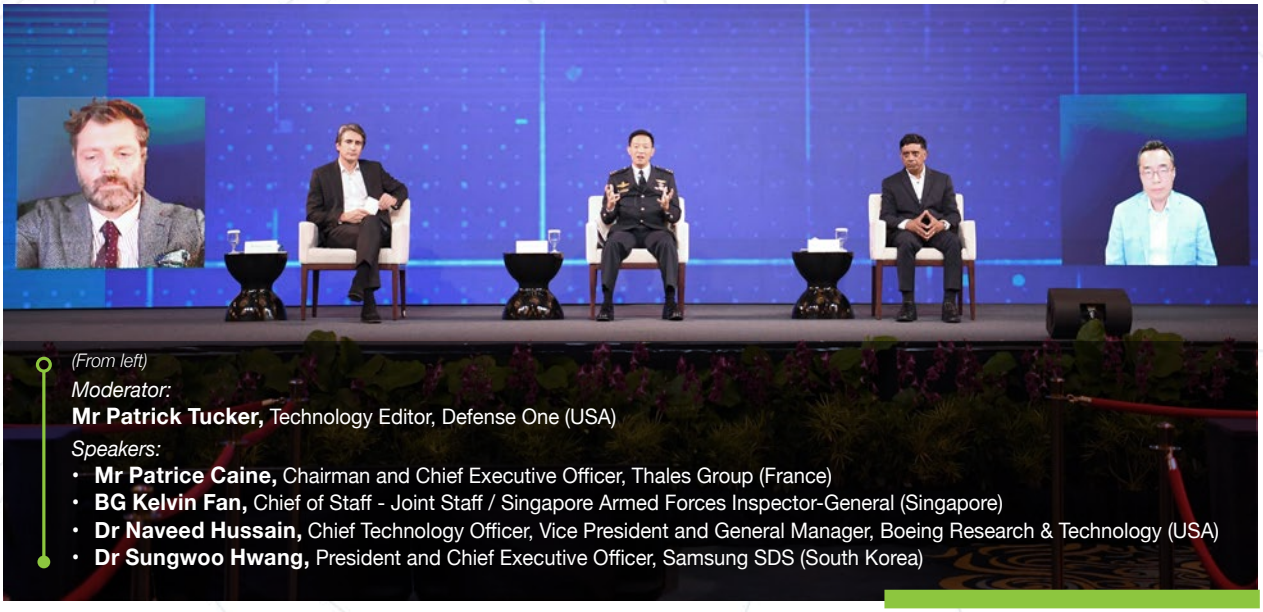
Moderator:

Mr Chng Kai Fong, Second Permanent Secretary, Smart Nation and Digital Government Group (Singapore)

Speakers:

- **Mr Ravinder Singh,** Group Chief Operating Officer (Technology & Innovation) and President (Defence & Public Security), ST Engineering (Singapore)
- **Mr Ravi Pandit,** Co-Founder and Chairman, KPIT Technologies (India)
- **Mr Raghav Sahgal,** President of Cloud and Network Services, Nokia (Finland)
- **LTG Thomas H. Todd III,** Deputy Commanding General, Acquisition and Systems / Chief Innovation Officer, United States Army Futures Command (USA)

SUMMARY PLENARY



(From left)
Moderator:
Mr Patrick Tucker, Technology Editor, Defense One (USA)
Speakers:
- **Mr Patrice Caine,** Chairman and Chief Executive Officer, Thales Group (France)
- **BG Kelvin Fan,** Chief of Staff - Joint Staff / Singapore Armed Forces Inspector-General (Singapore)
- **Dr Naveed Hussain,** Chief Technology Officer, Vice President and General Manager, Boeing Research & Technology (USA)
- **Dr Sungwoo Hwang,** President and Chief Executive Officer, Samsung SDS (South Korea)

Digital Engineering

Dr Hussain began by sharing the digital engineering techniques used by Boeing to enhance the speed and quality of development, enable predictive maintenance and enhance operator training. He explained how Boeing engineers could now achieve end-to-end optimisation via the use of digital system models to understand the impact of each design decision on every other part of the life cycle, including production and sustainment.

Quantum Engineering

Dr Hwang shared how the advent of quantum computing would break current assumptions of cryptographic security, and the importance of post quantum cryptography for secure communications. Mr Caine opined that quantum sensing and communications applications might be more achievable than having workable quantum computers in the near term, enabling a multitude of new applications such as precise navigation without GPS. He added that massive investments were required for R&D to reach sufficient levels of maturity before commercial applications could be discovered, and government funding was required to bootstrap its progress.

Collaboration

Responding to Mr Tucker's query on the methods to leverage commercial technology for unique military requirements, BG Fan described his strategy as one that was centred around collaboration. He elaborated that smart camps and bases could be sandboxes for operators and technologists to co-develop and experiment with autonomous systems, green technologies and digital tools. He shared how exercises, training and attachments were opportunities to develop interoperability via win-win collaboration. He concluded that new ops-tech processes were required for cross-domain teams to iterate on solutions collaboratively to combat future threats. He suggested that this concept might evolve further in future, with technologists driving military operations in new domains such as 5G, AI and cyber.

Talent Attraction

Responding to an audience's question of why "young techies" would choose the government over private industries, both Mr Terence Emmert, Acting Director of Defense Research & Engineering for Advanced Capabilities at the US DoD – who was a guest commentator – and BG Fan replied that it would be to serve a greater purpose, and to make a difference to the nation. They felt that defence establishments needed better ways to tell real stories about what they did.

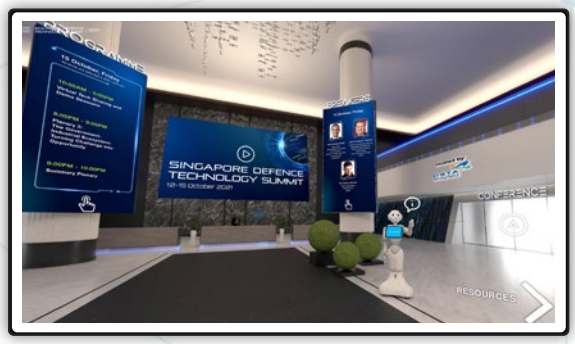
Reflections on Tech Summit 2021

Mr Emmert shared in his reflections on Tech Summit 2021, that humans were fallible, and thus our forecasts for the future were very likely to be wrong. We would thus need to challenge our thinking continuously, be flexible to adapt and adopt the motto that "faster is better". He introduced the term "cooperatition" which meant that while competition was an intrinsic component of innovation, parties with mutual interests should also seek to cooperate by sharing ideas and pursuing collaboration together.

VIRTUAL PLATFORM

With Tech Summit 2021 being conducted in a hybrid setting, a virtual platform was established to accommodate hundreds of participants as they tuned in to the plenary sessions and one-on-one dialogue online.

Beyond the main programme, there was also a virtual tech showcase where more than 15 organisations exhibited their innovative use of technologies in diverse domains, including the internet-of-things, digitalisation and cybersecurity.



Get a glimpse of where the action and rich discussions took place.

ENGAGEMENTS

Apart from the compelling conversations that took place during the plenary sessions, the third Tech Summit opened doors for greater exchange of ideas, collaboration and partnership. Over the four days, numerous meetings – both online and in-person – were arranged on the sidelines where government and industry leaders met and discussed about common challenges in defence, and the approaches to address them.

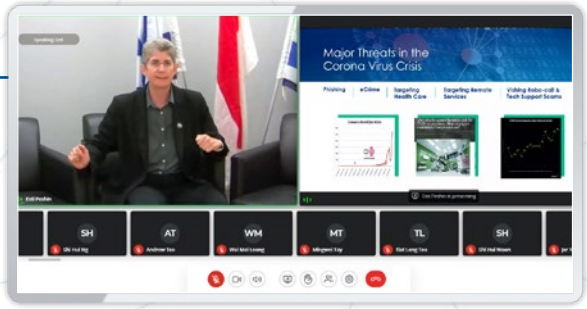
VIRTUAL TECHNOLOGY SHARING AND DEMO SESSIONS

Translating VUCA into Vision, Understanding, Confidence and Agility with Modelling and Experimentation

Mr Tan Yuh Cherng, General Manager of ST Engineering Training & Simulation Systems Pte Ltd, shared his perspective on how simulation and experimentation can help defence technology planners mitigate the VUCA environment whilst delivering new programme capabilities.

Cyber Resilience as the Master Key for National Grade Cybersecurity

As part of the tech sharing by the Israel Aerospace Industries, Ms Esti Peshin, Vice President and General Manager of the Cyber Division, elaborated on the five cybersecurity pillars necessary for overseeing, managing and recovering from cyberattacks, and how the establishment of a cybersecurity centre can elevate a country's resilience to cyberattacks.

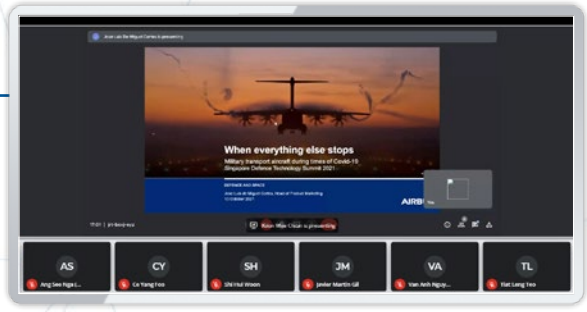


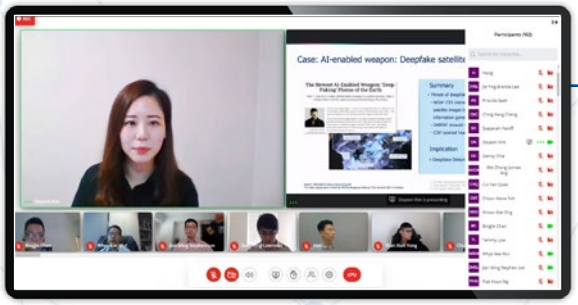
Connected Experience for Digital Defence

Mr Dirk Dumortier, Head of Business Development, Smart-City & Healthcare, Asia Pacific at Alcatel-Lucent Enterprise, elaborated on the organisation's connected defence solutions, and touched on various areas such as mission-critical autonomous networking and a connected experience for digital defence.

When Everything Else Stops – Military Transport Aircraft During Times of COVID-19

Mr José Luis de Miguel Cortés, Vice President and Head of Product Marketing at Airbus Defence and Space, expounded on the activities carried out during a military aircraft field, including the development of the C295 FITS Mission System (COMMOMISS) capability for the remote operation of airborne mission systems.





Can You Trust What You See in an AI-Generated Cyber World

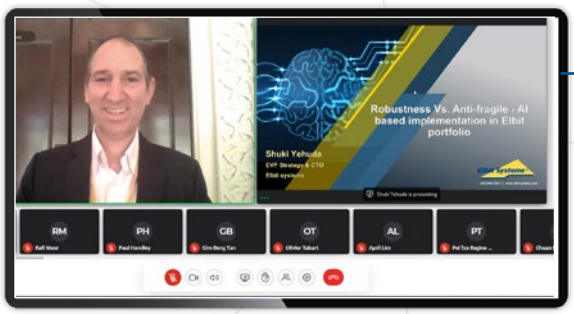
What is deepfake? What are the opportunities and threats in an AI-generated cyber world? Ms Doyeon Kim, Strategic Consultant of Team9, a corporate venture of Samsung SDS, shared about Samsung SDS' deepfake detection model, and how defence practitioners can utilise it to deal with deepfakes in real life.

Demonstrate the MAK Fires Training System in the Context of the MAK ONE Multi-Domain Synthetic Environment

In this demonstration, Mr Dan Brockway, Vice President of Marketing, Ms Alicia Combs, Director of Training Solutions, and Mr Bill Kamer, Business Development of Simulation, all from MAK Technologies – a company under ST Engineering North America – provided participants a glimpse of the vision for multi-domain operations, and how the modelling simulation environment is able to meet specific objectives for fires training.

Combat AI Technologies

Dr Erez Berkovich, Deputy General Manager of R&D at Land and Naval Division, and Dr Lior Eldar, R&D Director of Combat AI Land Systems, both from Rafael Advanced Defense Systems, discussed about the challenges of developing Combat AI technology and decision systems for terrestrial combat.

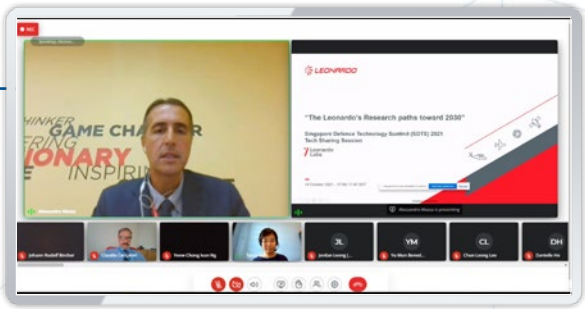


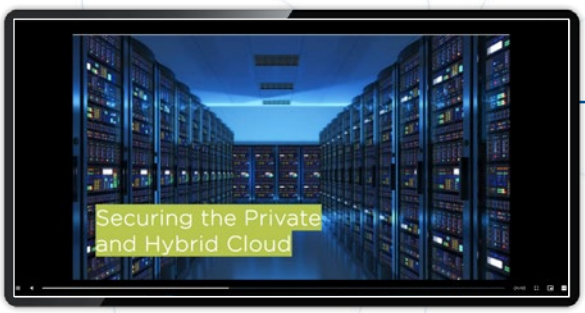
Robustness vs Anti-fragile – AI-based implementation in Elbit Portfolio

With a technological revolution in sensors, computing power and AI, how do systems and solutions go beyond robustness? Mr Shuki Yehuda, Executive Vice President, and Strategy and Chief Technology Officer at Elbit Systems, presented on concepts of robustness versus anti-fragile, and how an enabled technology will lead to a new era of complex system solutions and capabilities.

The Leonardo's Research Paths Toward 2030

Providing an introduction about Leonardo Labs, Mr Alessandro Massa, Head of Corporate Research Labs and Chief Technology & Innovation Office at Leonardo S.p.A., shared about various research domains such as big data, unmanned and robotics, and electrification.





The Invisible Hybrid Cloud, powered by Nutanix

Mr Justin Hurst, Chief Technology Officer at Nutanix (Asia Pacific and Japan), provided insights into the balance between agility and security, and how practitioners can prepare for a rapidly evolving threat landscape.

Enabling Hyperconnected Operations Through 5G-enabled Network-as-a-Service for Defence

During this tech sharing, Dr Krishna Balachandran, Partner & Director of Bell Labs Consulting at Nokia Bell Labs, addressed how an evolved 'network as a service architecture' is able to establish the basis for enabling massive automation of C4ISR systems and accelerate decision-making through real-time intelligence analytics, asset tracking and augmented remote operations.

Leveraging 5G and AI in an Increasing VUCA Environment

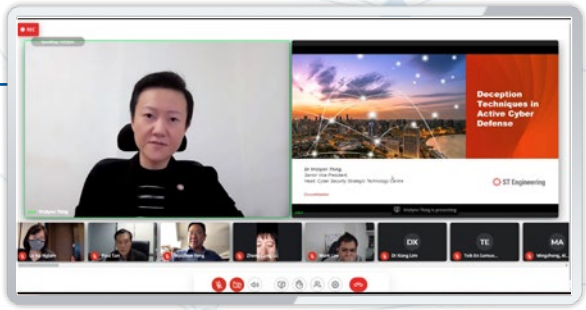
To leverage 5G and AI in an increasing VUCA environment, Mr Ho Mun Choong, 5G Growth Lead, and Mr Ying Shaowei, Senior Partner – both from NCS Pte Ltd – and Ms Noelle Yeo, Innovation and Strategic Partnerships Manager at Singtel's FutureNow Innovation Centre, shared about the possibilities and dominant use cases of 5G, as well as the usage of AI to address VUCA escalation.

Defence Cloud – A New-Generation Complete Solution for Armed Forces

Citing various examples, Dr Bernhard Quendt, Chief Technical Officer and Senior Vice President of Thales, explained how digital technologies can be leveraged as force multipliers to generate benefits for the defence space.

Deception Techniques in Active Cyber Defence

Dr Vrizlynn Thing, Senior Vice President and Head of Cybersecurity of the Strategic Technology Centre at ST Engineering, discussed about the various deception techniques and how they may be leveraged to build a holistic, deception-based defence.



AI Demo of Rafael's Systems

In this demonstration by Rafael Advanced Defense Systems, Mr Bar Oriol, Marketing and BD Director of the Multi Domain Warfare Directorate, and his team, showcased the virtual training of a doctrine engine, the benefits of it and how it works.

Inspiring the Next Generation

As part of DSTA's student engagement efforts, arrangements were made for some 160 students from over 30 schools to participate in activities of the Tech Summit. Over 90 students gained hands-on experience with Reinforcement Learning – an advanced machine learning technique – as they built and trained their very own race cars at the Amazon Web Services (AWS) DeepRacer Workshop, which was held on the sidelines of the Tech Summit.

TECH SUMMIT ON SOCIAL MEDIA

Over 170 posts were shared on various platforms such as Facebook, Instagram, LinkedIn and Twitter, leading to and during the summit!

Heng Swee Keat
October 13 ·

Many technologies integral to our daily lives originated from the defence sector. GPS and the internet are well-known examples. More recently, in 2013, the US defence sector funded a start-up called Moderna to develop mRNA therapeutics, then an unproven idea. "Dual use" — the use of defence tech in the civilian realm has changed the world for the better.

In the coming years, "dual use" will become more of a two-way street, with more discoveries originating from the private sector and adapted by the defence and space industries. This is because companies are steadily increasing their investment in R&D. For example, NASA is already sending equipment into space using the private company SpaceX.

This is one of the shifts that I shared at this evening's Singapore Defence Technology Summit. I also spoke about how we need to better address new asymmetric threats such as cyber-attacks, build more adaptive capacity to deal with disruptive shocks, and "green" our militaries to cope with climate change.

Each nation has the responsibility to safeguard its sovereignty and the security of its citizens. But this need not be a zero-sum game. All nations face common threats that can severely disrupt lives and livelihoods — this pandemic is a good example. To address these threats, we must do all we can to build greater trust and confidence, and strengthen partnerships.

#SGTechSummit

Ng Eng Hen
October 13 ·

The 3rd Singapore Defence Technology Summit organised by DSTA Defence Science and Technology Agency brings together close to 800 participants including leaders from government, commercial, academia and think-tanks. This Summit serves a useful role to encourage partnerships and consensus that can guide the appropriate use of new technologies like autonomous drones and artificial intelligence in decision making for military platforms. We need to ensure that we continue to be masters of new technologies, to serve our needs and promote stability, and not unintentionally lead us into dangerous situations with no retreat.

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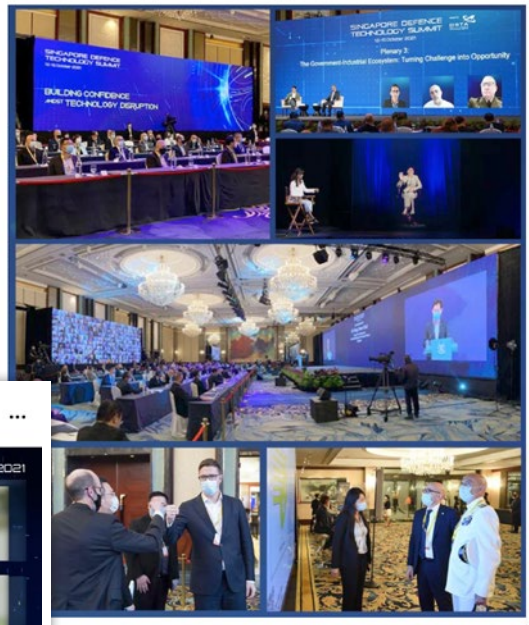
After 4 days of dynamic discussions, extensive tech sharing and demo sessions, it's a wrap for the #sgtechsummit!

A BIG thank you to all our ministers, moderators, speakers, partners and participants for joining us at our very first hybrid summit.



ST Engineering
8 October ·

Join us at Singapore Defence Technology Summit 2021 for the latest insights and development of defence and security capabilities. In the plenary session, Ravinder Singh, Group Chief Operating Officer, Technology & Innovation, and President, Defence & Public Security, will share his views on companies and industries that have navigated their way through recent disruptions, created niche opportunities, and their collaborations with governments and defence technology establishme... See more

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singaporedsta Tech Summit 2021 · Bringing together thoughts and insights from across the globe, the #sgtechsummit will host a series of diverse discussions from innovators and industry experts in the defence and tech landscape.

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TESTIMONIALS

"I want to compliment the organiser, DSTA, and the Ministry of Defence (Singapore) for pulling this event off. In three iterations, the Tech Summit has been established as one of the most prominent conferences on this topic globally. It's a great panel with lots of great speakers and global views to global issues."

Mr Kusti Salm
Permanent Secretary, Ministry of Defence (Estonia)

"I've attended a lot of hybrid events and the Tech Summit is the best so far. It's very well organised, very detail-oriented, and everybody feels very safe. The organisers have thought of things that most people wouldn't have thought about, and it's a very proud accomplishment because I know it's no easy task."

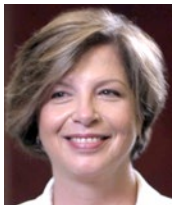
Dr Sean McFate
Professor of Strategy, Georgetown University and the National Defense University (USA)

"My deepest thanks to DSTA for assembling a wonderful and inspiring summit blending both physical and virtual attendees that came in from all over the world, and really spending time together to discuss, explore, investigate and inspire each other on creating a very bright future for the whole world."

Dr Naveed Hussain
Chief Technology Officer, Vice President and General Manager, Boeing Research & Technology (USA)

"The Singapore Defence Technology Summit has proven to be a very useful platform for collaboration, with the pertinent issues discussed. There are people from all over the world with different types of interests, backgrounds and professions. Apart from the speeches and discussions, the biggest takeaway would be the meeting of people – regardless if you've actually met them in person or virtually."

CDR Stefan Mattsson
Defence Attache/Military Attache to Singapore and Indonesia, Embassy of Sweden



"I'm extremely happy to be part of the third Tech Summit, and to be given the opportunity to meet top leaders in the defence sector from all around the world. I take my hat off for pulling off such a conference during this heightened period – well done DSTA, you did a fantastic job!"

Dr Irit Idan
Executive Vice President for Research and Development, Rafael Advanced Defense Systems (Israel)

"There're lots of restrictions because of COVID-19 but we were still able to share information and meet top thinkers from government, commercial and defence online despite the limited interactions offline. It is a very impressive and meaningful conference."

Dr Suh Jae Il
Senior Vice President, Samsung SDS (South Korea)

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