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INTEGRATED, ASYMMETRIC, AND FLEXIBLE: CONCEPTUALISING A MULTI-DOMAIN SAF

AIM

1. This paper seeks to apprise the Director of Joint Operations¹ of critical insights to be gleaned from the U.S. concept of Multi-Domain Operations (MDO), which has the potential to inform and enhance ongoing force modernisation efforts by the Singapore Armed Forces (SAF).

INTRODUCTION

2. Developed by the U.S. Army to address the repositioning of American national security from combating transnational terrorism to prolonged strategic competition with rival powers,² the MDO concept articulates how ground forces, working within the ambit of a joint force, can counter and ultimately prevail in competition against a capable adversary across the land, air, maritime, space, and cyber domains.³ As the MDO concept continues to gain further traction amongst America's allies as the pre-eminent solution to near-peer conflict,⁴ it is increasingly set to exert significant influence over future Joint Operations doctrine and thinking. To this end, the SAF will benefit from an understanding of the MDO concept, and how it can be leveraged to unlock breakthrough concepts in future operations.

3. To examine the question of how the MDO concept might be applied to the SAF's purposes, this paper begins by discussing the SAF's unique context, which precludes a wholesale adoption of the concept. Next, this paper proposes a trio of design principles as an overarching conceptual framework for the SAF's application of the MDO concept: first, the SAF should be more *integrated*, not only as a joint force, but also with its interagency partners; next, the SAF should continually seek to acquire and maintain an *asymmetric* advantage over its adversaries; and finally, the SAF should be sufficiently *flexible* to achieve a wide range of operational effects under conditions of increased strategic uncertainty. In closing, this paper concludes that the SAF must continue to build on its strengths while minimising inherent risks.

¹ The SAF's Director of Joint Operations is the approximate national equivalent of the CAF's Commander CJOC.

² Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, D.C.: Department of Defense, 2018), 2.

³ Department of Defense, TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028* (Washington, D.C.: Army Training and Doctrine Command, 2018), 6.

⁴ Of note, three of the four non-U.S. members of the Five Eyes (FVEY) alliance have already taken significant steps to interpret and adapt the MDO concept for their own purposes: the UK Ministry of Defence (MOD) promulgated a Joint Concept Note (JCN) on Multi-Domain Integration (MDI) in November 2020. The Australian Defence Force (ADF) followed suit by approving its concept of Multi-Domain Strike within the same month. Additionally, refinements to a preliminary draft of the CAF's Pan-Domain Force Employment Concept (PFEC) are currently underway.

DISCUSSION

4. At first sight, certain elements of the U.S. MDO concept appear to be reflected in the SAF's ongoing force development priorities: the SAF is seeking to develop effective strategies to counter "hybrid" threats emanating from all domains, in particular the cyber and information battlespace, as it recognises that the nature of conflict has changed dramatically.⁵ Furthermore, the SAF also envisions the need to exploit technological advances in artificial intelligence (AI), data analytics (DA), and robotics in order to unlock disruptive, game-changing warfighting concepts.⁶ To this end, the MDO concept complements the SAF's force development efforts and provides a means to consider how the SAF would integrate and converge multi-domain effects across peace to war.

Key Differences between SAF Doctrine and Multi-Domain Operations

5. However, certain unique aspects of the SAF's circumstances preclude a wholesale adoption of the MDO concept, regardless of its validity.

6. While the U.S. Army has operationalised MDO to meet specific challenges posed by near-peer adversaries, this notion has limited applicability to the SAF. The U.S. considers Russia and China as its "near-peer" adversaries, given their demonstrated ability to challenge American dominance in all domains.⁷ In contrast, Singapore's defence philosophy is explicitly "non-directional", and aimed at deterring any and all threats to its peace and security.⁸ Moreover, given Singapore's preference for neutrality on extra-regional issues,⁹ it is unlikely the SAF will find itself deployed into any multi-national coalition against a U.S. near-peer, unless Singapore's own existence were to be directly threatened.

7. Furthermore, the space and cyber domains are relatively uncharted waters for the SAF. Organic space capabilities are glaringly absent from the SAF's military arsenal, and Singapore is heavily reliant on the U.S. and other partner nations granting it access to space-based technologies for communications, Intelligence, Surveillance and Reconnaissance (ISR), as well as Precision Navigation and Timing (PNT). As for cyber, the establishment of the SAF Cyber Defence Group in 2017 for round-the-clock monitoring of military networks signaled the SAF's first forays into this domain, with an overwhelming emphasis on the protection of friendly networks.¹⁰ However, critics have charged that this is an incomplete deterrence against cyber threats, as the SAF does not

⁵ Michael Raska, "The SAF After Next Incarnation," *RSIS Commentary* no. 41 (2019): 1.

⁶ *Ibid.*

⁷ Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, D.C.: Department of Defense, 2018), 3.

⁸ Tim Huxley, *Defending the Lion City: The Armed Forces of Singapore*, (NSW: Allen & Unwin, 2000), 103.

⁹ William Choong, and Ian Storey, "Southeast Asian Responses to AUKUS: Arms Racing, Non-Proliferation and Regional Stability," *Perspective* 134 (2021): 6.

¹⁰ Adrian Lim, "Singapore Strengthens Cyber Defence with New Organisation," *The Straits Times*, 4 March 2017.

possess any offensive cyber capabilities with which to target cyber adversaries at source.¹¹

Applying the Multi-Domain Operations Concept to the SAF

8. Notwithstanding, an examination of the specific implications of the MDO concept for the future SAF is timely and warranted. A trio of design principles – *Integration*, *Asymmetry*, and *Flexibility* – provide a useful conceptual frame to understand how the MDO concept may be applied to the SAF’s purposes. These principles may be expanded upon as follows:

Integration

9. First, the future SAF should be more *integrated*, not only as a joint force, but also with its interagency partners. Currently, the SAF’s force transformation trajectory is predicated on its core deterrent and warfighting mission: “to enhance Singapore’s peace and security through deterrence and diplomacy, and should these fail, to secure a swift and decisive victory.” Naturally, the SAF is configured to counter hostile aggression by a potential adversary’s armed forces. However, akin to the beliefs of the U.S. and a number of its allies, hostile actors seeking to mount persistent and coordinated challenges to peace and security may do so more efficiently by bringing all instruments of their national power to bear.¹² Such novel situations can neither depend on piecemeal solutions cooked up within functional Service silos, nor be conducted in isolation from other instruments of national power. Instead, they demand the holistic application of military power by a force that is devoid of inter-Service silos, and fully plugged into a larger national security framework.

10. A brief examination of the SAF’s campaign plans reveals a largely Service-centric approach that unnecessarily constrains the lethality of the SAF’s joint force in war. Huxley demonstrates this point in his hypothetical account of the SAF invading a neighbouring country in a bid to restore Singapore’s national sovereignty:¹³ first, he postulates that the Republic of Singapore Air Force (RSAF) would conduct a pre-emptive strike to establish overwhelming air superiority, before handing it over to the Singapore Army to seize the initiative on land, with elite Commando and heli-mobile Guards units infiltrating and securing critical land-links. Once secured, these land-links, he argues, would facilitate a bold thrust into the heart of the adversary’s territory by combined arms formations, primarily comprising armoured forces and infantry. Concurrently, he posits that the Republic of Singapore Navy (RSN) would be fending off attempts by the opposing navy to wage a *guerre de course* against Singapore in the neighbouring waters.

¹¹ Guang He Lim, “Cyberspace: What are the Prospects for the SAF?” *Pointer, The Journal of the Singapore Armed Forces* 41, no. 1 (2015): 66; Edwin Chua, “A Minnow Among Sharks: Cyber Conflict and the Lessons for Singapore,” *Pointer, The Journal of the Singapore Armed Forces Monograph no. 13 – Defending our Cyberspace* (2019): 16.

¹² Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America* (Washington, D.C.: Department of Defense, 2018), 2.

¹³ Tim Huxley, *Defending the Lion City: The Armed Forces of Singapore*, (NSW: Allen & Unwin, 2000), 188-189.

If required, the RSN would also secure the maritime flanks for the force projection of expeditionary elements of the Army, in support of the major land offensive. Evidently, there is scope to refresh such an approach to Joint Operations by more fully integrating multi-domain effects, regardless of which Service provides the capability.

11. Furthermore, the SAF should also consider operationalising a comprehensive approach to defend Singapore's interests at home and abroad. To do so, it could emulate the Homefront Crisis Executive Group (HCEG) – Singapore's foremost interagency coordination platform across the Public Service – to harness the state's capacity for effective response to future threats.¹⁴ Formed in the 1970s to bridge coordination gaps among different agencies, the HCEG today comprises senior executives from all Ministry departments who collectively take direction from the elected government of the day.¹⁵ In turn, taskforce-like Crisis Management Groups (CMGs) operate under the HCEG's purview. These are entities that can muster various clusters of relevant agencies to respond to a myriad of crisis scenarios, such as an unanticipated influx of refugees or the need to evacuate Singaporean non-combatants based overseas.¹⁶ Modelling the SAF's approach after the HCEG's structures and processes will certainly facilitate its ability to draw upon and, in turn, provide niche capabilities for greater operational effectiveness in the future.

12. While the idea of shaping a more tightly integrated operational approach in the SAF is not new, the potential ways in which forces will integrate domain capabilities and involve strategic partners in the future fight are. For the future SAF, recognising that military power is rarely, if ever, the panacea to all operational problems is the critical first step. The military might win battles and campaigns, but it is just one instrument of policy that should be augmented by others in the national security toolkit, whether in peace or in war. Ultimately, accomplishing future missions and tasks will increasingly require the SAF's joint force to adopt a Whole-of-Government mindset.

Asymmetry

13. Next, the future SAF should continually seek to acquire and maintain an *asymmetric* advantage over potential adversaries. Over the years, the SAF has invested heavily in technology to compensate for its inability to deploy a large military force. Yet at the same time, its long-standing strategic focus on maintaining a technological edge has engendered a characteristic "predictableness" that would ultimately prove to be its Achilles' heel. To this end, the use of MDO to act in one domain while achieving effects in another, and potentially in unexpected ways, holds great promise for the SAF.¹⁷

¹⁴ James Low, "Singapore's Whole-of-Government Approach in Crisis Management," last modified 31 December 2016, <https://www.csc.gov.sg/articles/singapore's-whole-of-government-approach-in-crisis-management>.

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ Jonathan Bott, "Outlining the Multi-Domain Concept Part III: Moving Toward Practical Application," *Over the Horizon*, last modified 28 June 2017, <https://othjournal.com/2017/06/28/outlining-the-multi-domain-operational-concept-part-iii-moving-toward-practical-application/>.

14. For example, the SAF could consider employing its Special Operations Force (SOF) for counter-cyber operations, which may be targeted at the adversary's ability to plan for and execute cyber offensives, thereby increasing the direct and indirect costs accrued to waging hostile cyber campaigns against the SAF.¹⁸ This might involve a variety of mission tasks, including the use of direct action to disrupt adversaries' hostile operations, to degrade their attack capabilities, to deny their ability to use attack infrastructure, or even to target their cyber personnel responsible for carrying out attacks.

15. Furthermore, the SAF could also consider the use of subsurface or space-based means to transport large quantities of personnel or materiel, not unlike the insertion of airborne or heli-mobile forces via aircraft, for speed, security, and surprise. Specifically, Singapore's proximity to the high seas as an island-state lends well to its use of subsurface means for the stealthy projection of forces beyond its shores. Moreover, its location on the Equator supports the relative efficiency of entering into geosynchronous equatorial orbit (GEO), which increases the accuracy with which the SAF may insert its units and equipment onto the battlefield from space.¹⁹

16. Indeed, the concept of asymmetry is a time-worn principle of warfare.²⁰ To invoke one of Sun Tzu's famed stratagems, an attacker should avoid head-on battle with a capable adversary, and instead strike at their weakness elsewhere.²¹ By extension, such asymmetric thinking also exhorts a defender to prepare vigorously for any number of contingencies in order to avoid fundamental surprises. To this end, it is imperative that the SAF continually develops a capability to accurately anticipate vulnerabilities where they may arise, whilst shaping a culture that embraces innovation in the future operating environment.

Flexibility

17. Finally, the future SAF should be sufficiently *flexible* to achieve a wider range of operational effects under conditions of increased strategic uncertainty. As a result of a major force modernisation drive that took place between the 1990s and 2000s, the SAF operationalised a "full-spectrum" operational capability in the fields of Joint Operations, Coalition Operations, and Operations Other Than War (OOTW).²² However, against a rapidly changing environment that is increasingly complex and dynamic, the continued relevance of military forces will depend heavily on their agility, flexibility, and adaptability. To create optimal effects against potential adversaries, the SAF must have a

¹⁸ Erica D. Borghard, and Shawn W. Lonergan, "Deterrence by Denial in Cyberspace," *Journal of Strategic Studies* (2021): 22.

¹⁹ Bleddyn E. Bowen, *War in Space: Strategy, Spacepower, Geopolitics* (Edinburgh: Edinburgh University Press, 2020), 71.

²⁰ Rory Cox, "Asymmetric Warfare and Military Conduct in the Middle Ages," *Journal of Medieval History* 38, no. 1 (2012): 100-125; cited in Michail Ploumis, "Comprehending and Countering Hybrid Warfare Strategies by Utilizing the Principles of Sun Tzu," *Journal of Balkan and Near Eastern Studies* (2021): 3.

²¹ Sun Tzu, *The Art of War* (Surrey, CA: Engage Books, 2020), 32.

²² Jacques Erasmus, "Full Spectrum Operations – A Viable Strategic Posture for the SAF?", *Pointer, The Journal of the Singapore Armed Forces* 41, no. 4 (2015): 13.

wide array of forces and capabilities at its disposal that can adapt and change as the strategic environment dictates.

18. One aspect of this is to equip units to deliver more finely-calibrated responses to dynamic and multi-dimensional security threats. A case in point is the RSN's *Independence*-class Littoral Mission Vessels (LMV), which are equipped with a suite of weapon systems to more effectively operate in high-end combat as well as in constabulary roles. Aside from conventional weapon systems designed to eliminate surface threats, each LMV also boasts a suite of less-lethal weapon systems. These include the Long Range Acoustic Device (LRAD), which is able to create directed blasts of high-decibel sound waves to warn and chase away intruding vessels, as well as the Laser Dazzler System (LDS), which is capable of issuing visual warnings in the day or at night.²³ Likewise, other Services will do well to emulate the RSN's lead on this front.

19. Another aspect entails a fundamental review of force structuring in the SAF to engender greater granularity in the employment of forces. The SAF currently considers the Division as its "basic unit of analysis" that is capable of employing effects and enablers in multiple domains.²⁴ However, the SAF could take a leaf from the U.S. military by focusing on the employment of multi-domain capabilities at the Brigade echelon and lower.²⁵ Accordingly, this would necessitate the experimentation of new doctrines and tactics by the SAF. Apart from joint intelligence, joint fires, as well as enhanced mobility and survivability, tactical echelons at the Brigade level and lower may also be augmented by specialised sub-units to prosecute limited information operations, cyber defence, and electronic warfare (EW) against the enemy – hitherto the sole preserve of the SAF's Combined Arms Divisions.

20. Ultimately, the impetus driving the SAF's pursuit for greater flexibility is an unmistakable one: to anticipate and respond to dynamic and complex threats by integrating the most appropriate, task-tailored elements together. Failing to do so could undermine the SAF's relevance in the future operating environment, and ultimately erode its strategic deterrent.

CONCLUSION

21. The SAF is committed to building a next-generation force that is better positioned for the future.²⁶ To this end, the U.S. MDO concept complements the SAF's ongoing force development efforts, whilst providing an opportunity for the SAF to unlock breakthrough concepts in future operations. Of note, the design principles of *Integration*, *Asymmetry*, and *Flexibility* provide a useful conceptual frame to understand how the MDO concept may be applied to the SAF's purposes. Whether the SAF can continue to

²³ Chuanren Chen, "Little to Lethal," *Asia-Pacific Defence Reporter* (2002) 42, no. 9 (2016): 32.

²⁴ Bernard Loo, "Zoological analogies and military strategy," *Military Studies at RSIS* (blog), 4 August 2012, <https://rsismilitarystudies.wordpress.com/2012/08/04/zoological-analogies-and-military-strategy/>.

²⁵ Department of Defense, TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations* 2028 (Washington, D.C.: Army Training and Doctrine Command, 2018), 23.

²⁶ Eng Hen Ng, (speech), Committee of Supply Debate, Parliament of Singapore, 3 March 2017.

fulfil its *raison d'être* of defending Singapore going forward depends on how well it can build on its strengths and minimise inherent risks, all the while adapting to the unpredictable nature of future operations.

RECOMMENDATION

22. It is recommended that the SAF adopts the design principles of *Integration*, *Asymmetry*, and *Flexibility* as the overarching conceptual framework to apply the U.S. MDO concept to purpose. In addition, the SAF should also consider the following proposals as part of its ongoing force modernisation efforts:

- a. A fundamental review of its Service-centric campaign plans to more fully integrate multi-domain effects;
- b. The operationalisation of a comprehensive approach to deal with internal and external security threats, with reference to the example of the Singapore Public Service's HCEG;
- c. The development of new employment concepts for its SOF to achieve greater operational effects within and across domains;
- d. The exploration of cross-domain methods of transporting large quantities of its personnel and materiel across the battlefield for greater speed, security, and surprise;
- e. The equipping of its units with calibrated, non-lethal response capabilities to deal with a wider spectrum of operational scenarios; and
- f. A review of its force structuring to push multi-domain capabilities to the tactical edge.

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