



**TRAINING AS WE (WANT TO) FIGHT:
TRANSFORMING ARMY TRAINING FOR A MULTI-DOMAIN SAF**

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JCSP 50

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AIM

1. This paper provides Commander, Army Training and Doctrine Command (TRADOC)¹, with recommendations on key changes to be made to Army training as part of the Singapore Armed Forces' (SAF) next-generation transformation efforts.

INTRODUCTION

2. In 2021, the Army concluded an exercise that validated the Full Operational Capability (FOC) of the Combined Arms Division (CAD), a key milestone of the Army's third-generation transformation efforts that it had embarked on since 2004.² The capstone exercise demonstrated the CAD's ability to exercise effective command and control (C2) over "an integrated and networked force, bringing precision capabilities to bear on the battlefield".³ As the Army concludes its 3G journey and transitions to the next phase of its transformation, it is likely to draw insights from novel warfighting concepts developed by other advanced militaries. In particular, a concept that had gained traction is Multi-Domain Operations (MDO), promulgated by the US Army in 2018 in response to a shift in US defence strategy towards strategic competition and conflict against near-peer state adversaries.⁴ MDO has since been adopted, to varying degrees, amongst US allies such as those in NATO and the Five Eyes community.⁵ At its core, the MDO concept emphasises integration of effects across all domains of warfare – land, air, maritime, cyber, and space, and coordination across whole-of-government in leveraging all instruments of national power, amongst others.

3. While the SAF has not publicly released any material detailing its next generation warfighting concept, there are indications that they are at least partially informed by MDO – related lexicon had entered news releases describing recent large-scale SAF exercises, such as "multi-domain smart warfighting", and optimising "sensors and strikers across domains".⁶ Observers of the SAF's force transformation over the years have also predicted that its next incarnation will focus on intensifying

¹ Training and Doctrine Command (TRADOC) is a sub-command of the Singapore Army responsible for the training and evaluation standards of Army forces, the development of Army training capabilities and operational doctrine, and integration of Army training both internally (i.e. across echelons and formations) and with other Services.

² Cindy Co, 'Singapore Army Completes Transformation to a 3rd Generation Force, on Track for next-Gen Shift', CNA, 30 June 2021, <https://www.channelnewsasia.com/singapore/singapore-army-completes-transformation-3rd-generation-force-track-next-gen-shift-1930741>.

³ Ibid.

⁴ 'TRADOC Pamphlet 525-3-1: The U.S Army in Multi-Domain Operations 2028' (United States Army Training and Doctrine Command, 27 November 2018), <https://api.army.mil/e2/c/downloads/2021/02/26/b45372c1/20181206-tp525-3-1-the-us-army-in-mdo-2028-final.pdf>.

⁵ Examples of warfighting concepts informed by MDO include the Integrated Operating Concept published by the UK Ministry of Defence; Multi-Domain Strike concept by the Australian Defence Force, and the Pan-Domain Force Employment Concept by the Canadian Armed Forces.

⁶ MINDEF Singapore, 'Factsheet: Ex Forging Sabre 2023 – Multi-Domain Smart Warfighting', 21 September 2023, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2023/September/21sep23_fs.

integration across all domains of warfare, including the cyber domain.⁷ Given the SAF's long-standing emphasis on maintaining a technological edge over its potential adversaries and relatively high levels of defence spending, there is little doubt that it will be able to realise the necessary capabilities and platforms to enable its next-generation transformation. At the same time, the operationalisation of these capabilities as an integrated whole can only be achieved through effective training. To that end, this paper highlights some of the main challenges of operationalising MDO under the current training system and proposes potential solutions to overcome them.

CHALLENGES OF TRAINING FOR MULTI-DOMAIN OPERATIONS

Service-Centric Training Systems

4. One of the key challenges that the SAF needs to overcome to achieve multi-domain integration is its service-centric training systems. Currently, the vast majority of training entities within the SAF reside within their individual services, which oversee the training requirements and integration of capabilities within their respective warfighting domains.⁸ The only "joint" training entity, SAFTI Military Institute, is primarily focused on leadership training and conduct of PMET courses for officers, warrant officers and specialists at various stages of their career, instead of developing or conducting multi-domain training packages that truly integrate capabilities across the battlespace domains. For example, while the four-week Joint Warfighter Course provides a baseline understanding of the missions and capabilities of the various services in their domains, it does not have sufficient rigour to qualify its trainees in operational planning at the joint level. At the joint Command and Staff Course (CSC), the next significant PMET milestone for mid-level officers, the operational planning phase is delivered in a service-centric manner, with students conducting operational planning only within the context of their parent service.

5. The siloed training system described above, if left unaddressed, will potentially impede the SAF's efforts to operationalise MDO in the future. In order to identify planning considerations and generate multi-domain options for operations, operational-level commanders and planners must possess sufficient knowledge regarding the capabilities and constraints associated with operations in the different domains, such as forces available, activities and effects as well as adversary operations that could affect own forces ability to conduct MDOs.⁹ However, the current system does not facilitate the acquisition of such expertise, nor provide sufficient hands-on opportunities for these future planners and commanders to practice planning for integrated operations. More importantly, a systemic lack of appreciation of other domains can perpetuate a single-domain mindset and culture, resulting in biases that could lead planners to ignore potential solutions or to de-prioritise support to tasks outside their own domain.¹⁰

⁷ Michael Raska, 'The SAF After Next Incarnation - RSIS', 8 March 2019, <https://www.rsis.edu.sg/rsis-publication/rsis/the-saf-after-next-incarnation/>.

⁸ The service-centric training commands are: Air Force Training Command (AFTC), Army Training and Doctrine Command (TRADOC), Naval Training Department (NTD), and Digital and Intelligence Service Training Command (DITCOM) (to be established with the creation of DIS as the fourth service).

⁹ Miranda Priebe et al., 'Multiple Dilemmas: Challenges and Options for All-Domain Command and Control' (RAND Corporation, 2020), <https://doi.org/10.7249/RRA381-1>.

¹⁰ *Ibid.*, 12.

Limited Training Space and Time

6. In the context of a small city-state dependent on conscription to fulfil its defence needs, the SAF faces perpetual challenges in terms of both limited physical space for military training as well as the limited time available to force generate operationally ready soldiers. As the SAF seeks to enhance its interoperability and integration across domains, the need for large-scale training involving units from different services will increase, placing additional demands on both physical training space as well as coordination across entities. However, such large-scale joint training can currently only be conducted in overseas training areas, such as in Australia, Germany, or the USA, for a limited number of weeks annually. This presents a few critical problems:

- a. not all entities that require joint training can have access to them;
- b. high administrative and logistical overheads to conduct such training in an expeditionary format.

7. To illustrate the first point, Exercise WALLABY 2022 in Australia saw the first live integration training of a new capability developed to enable information captured by Air Force UAVs to be transmitted directly to tactical Army forces with an access point, enhancing the Army's tactical ISR capabilities and facilitating last mile targeting efforts.¹¹ While such integration training can only be conducted overseas due to restrictive air space de-confliction requirements in Singapore, the once-a-year frequency of Ex WALLABY means that only a small proportion of Army ISR forces would gain experience operating with the Air Force in a tactical context. Similar bottlenecks exist in the fulfilment of joint training requirements such as joint forward attack controllers. Unless these constraints can be overcome, training capacity will likely remain the limiting factor to SAF's efforts to operationalise MDO.

8. The problem of limited training opportunities is compounded by the disproportionately heavy administrative, financial, and logistical costs associated with conducting such training in an expeditionary format. For the 2023 edition of Ex WALLABY, traditionally the SAF's largest overseas exercise, the Forward Support Group (FSG) had to ship approximately 450 military platforms over 5,000 km to and from Australia for the exercise, a task made more manpower-intensive due to Australia's strict biosecurity controls.¹² In addition, the FSG was also responsible for the forward deployment and sustainment of supply, transport, medical, and maintenance capabilities for the training units throughout the training period. This was a mammoth task for which planning commenced more than half a year prior to the exercise. While this heavy investment in manpower and resources undoubtedly demonstrates the SAF's commitment to high-end joint training, it raises the question of whether such "expeditionary" training would continue to be the most efficient way to train MDO capabilities in the future, especially with the SAF's shrinking manpower pool and moderate budgetary growth outlook.

¹¹ Wei Kai Ng, 'Singapore Army and RSAF Link Drones for the First Time to Give Soldiers More Intel', *The Straits Times*, 28 September 2022, <https://www.straitstimes.com/singapore/army-and-airforce-link-drones-for-the-first-time-to-give-soldiers-more-intel>.

¹² Louisa Tang, 'How the Singapore Armed Forces Shipped over 400 Military Vehicles to Australia for Exercise Wallaby', *CNA*, 12 October 2023, <https://www.channelnewsasia.com/singapore/saf-exercise-wallaby-2023-forward-support-group-ship-vehicles-camp-growl-3832366>.

POTENTIAL AREAS FOR REVIEW

9. Considering the above challenges, there is a need for the SAF to fundamentally review its training modality, even as it seeks to acquire new platforms and capabilities in support of its future warfighting concept. For the Army, one thing is clear – the current business-as-usual training model will not serve it well as it seeks to deepen integration with other domains of warfare and coordinate with other national instruments of power. The following section highlights some potential areas for review.

Re-designing Training Systems

10. To enhance integration of effects across multiple domains, the Army must redesign its training systems from one that is focused on component capabilities to one that emphasises synchronisation with other joint entities, including the Digital and Intelligence Service (DIS) – the newly inaugurated fourth service responsible for the dealing with threats in the digital domain.¹³ To that end, TRADOC must collaborate with training entities from the other services, identify current competency gaps in its servicemen in planning for and executing MDO, and re-design its training packages in order to address these gaps.

11. For a start, the SAF can consider implementing a dedicated programme to equip officers from all services with the skills and knowledge necessary to function at a joint operational headquarters. Beyond the immediate tangible benefits in raising a multi-domain capable workforce, such a programme would also help to overcome service-centric thinking and culture that currently exists within the organisation. Of course, such a programme would need to be rationalised against time currently invested in other service-centric PMET requirements over an officer's career. For the Army, however, this is a trade-off that it should embrace, given that the ability for its officers to consider and incorporate multi-domain effects in an operational plan represents a significant step-up in capabilities as compared to gaining incremental proficiency in planning within a single domain.

Enhancing Training Spaces

12. The shift towards MDO demands a re-think in how training space are designed and utilised. Given that one of the most significant implications of MDO to training is the need for increased space and purpose-built infrastructure, it is timely that the SAF has taken steps to expand its access to large-scale training areas under the Treaty on Military Training and Training Area Development with Australia, which will increase the available training window annually from six weeks to 18 weeks.¹⁴ The increased access, along with purpose-built facilities such as Combined Arms Air-Land Ranges will enable integration training between land and air forces to be conducted in a more

¹³ MINDEF Singapore, 'Fact Sheet: The Digital and Intelligence Service', 28 October 2022, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2022/October/28oct22_fs.

¹⁴ MINDEF Singapore, 'Fact Sheet: Singapore-Australia Treaty on Military Training and Training Area Development in Australia', 23 March 2020, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2020/March/23mar20_fs.

systematic, vice opportunistic, manner. For the Army, the steady-state goal must be for the majority, if not all, of its combat units and Bde/Div HQs to have the opportunity to utilise the vast training space available to hone their competencies during their advanced phases of training. For administrative sustainability and efficiency, the option of permanently basing a fleet of training platforms in Australia should also be considered.

13. Physical training space, however, only represents part of the solution. Advancements in simulation technology and computing power are prompting many advanced militaries to develop high-fidelity synthetic environments that enable forces from various domains to train together using different permutations of live-virtual-constructive (LVC) environments.¹⁵ This represents a shift away from the current application of military simulations, which comprise domain-specific platforms (e.g. fighter simulators, land-based platform simulators) isolated from each other, without the ability to synchronise in real-time. Besides reducing reliance on physical space and costs associated with real-world live exercises, such a capability can allow varied multi-domain scenarios to be practiced in a fail-safe environment and enable high-quality data collection to facilitate targeted after-action reviews.¹⁶ Ambitious programmes to realise this capability include the US Navy's Continuous Training Environment and the British Army's Collective Training Transformation Programme.¹⁷ ¹⁸ As the largest service that operates the widest variety of simulators across LVC environments, the Army is well-placed to lead the push towards a common simulations environment across the SAF, enabling scalable joint training to be conducted in the future.

Revamping Training Structures

14. Another aspect of the SAF's training ecosystem that requires further review is the lack of joint training structures within the organisation. Thus far, co-ordination and cooperation amongst the Services have achieved mixed successes in achieving some joint training outcomes. As the SAF seeks to deepen its integration both internally and with other WoG partners under the MDO concept, there are limits to the extent that this can be achieved through self-synchronisation alone. In instances where competing training or resource requirements arise, service-centric training entities would ultimately prioritise their internal requirements, guided by their chain of accountability to the parent Service. A truly dedicated joint training entity is required to advocate for training needs for the joint force, synchronise training development initiatives across the Services to ensure interoperability, and develop a coherent roadmap to operationalise MDO capabilities through training. A joint training entity can also serve as a single point of contact with strategic partners such as other government agencies

¹⁵ Live environments refer to actual warfighters operating actual weapons/platforms; Virtual environments refer to actual warfighters operating simulators; Constructive environments refer to computer programmes controlling virtual systems.

¹⁶ Timothy Marler, 'Unlocking Training Technology for Multi-Domain Operations', 24 January 2023, <https://www.rand.org/pubs/commentary/2023/01/unlocking-training-technology-for-multi-domain-operations.html>.

¹⁷ 'Naval Surface Warfare Center, Port Hueneme Division Implements Navy Continuous Training En', Naval Sea Systems Command, 28 October 2021, <https://www.navsea.navy.mil/Media/News/Article-View/Article/2825743/naval-surface-warfare-center-port-hueneme-division-implements-navy-continuous-t/>.

¹⁸ The British Army, 'Army Training Transformed by Digital Technology', September 2021, <https://www.army.mod.uk/news-and-events/news/2021/09/collective-training-transformation-programme-cttp/>.

and NGOs to foster interagency coordination through training exercises and be responsible for raising credible opposing forces to simulate an adversary able to contest in all domains.

CONCLUSION

15. As with its previous modernisation efforts, the SAF's next-generation force development and operational concepts will remain informed by the latest conceptual innovations pursued by other advanced militaries, such as the US MDO concept. Beyond modernising its warfighting arsenal, the SAF needs to pay attention to the gaps and challenges in operationalising MDO through the current training ecosystem. In the absence of a truly joint training entity to oversee multi-domain training at the operational level, the Army is well positioned to spearhead changes in its training systems, spaces, and structures to set the stage for training MDO-capable forces.

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