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Lessons for the ADF from Operation Spider's Web

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On 1 June 2025, Ukraine carried out an audacious attack deep inside Russian territory that resulted in the destruction of around one third of Russia's strategic strike fleet. This had immediate impact of Russia's ability to execute long-range strike on Ukraine.

This activity was more than 18 months in the making. In an operation code-named Spider's Web, Ukraine transported explosive-laden quadcopters, concealed in transportable huts, to five bases across Russia, ranging from St Petersburg to Siberia.

While uncrewed aircraft systems have been a feature of the conflict environment for more than two decades, their widespread use by both sides in the Ukraine-Russia conflict has focussed significant attention on how to employ and counter them (Sweetman, 2024).

So what can the ADF learn from Operation Spider's Web?

Here, we explore some lessons for the ADF in air power, strategy, procurement, and innovation.

Operation Spider's Web marks a pivotal moment in modern warfare, demonstrating a radical shift in how strategic attack can be conceived and executed. It highlights that military innovation doesn't depend solely on expensive, high-tech systems but can emerge from low-cost—and sometimes unexpected—sources.

Strategic attack describes offensive air activities that create strategic effect (Air and Space Power Centre, 2022). This is typically a role undertaken by high-end, complex and expensive systems like the Tomahawk Land Attack Missile (TLAM) or the Joint Air-to-Surface Standoff Missile Extended Range (JASSM-ER). The complexity, cost and export controls over systems like TLAM and JASSM limit strategic attack capabilities to a few advanced militaries.

Operation Spider's Web successfully employed a long-range strategic attack using readily available, low-cost, and low-complexity explosive-laden quadcopters (Second Line of Defence, 2025).

Retired USAF Lieutenant General David Deptula describes this as creating a 'Person-Portable Precision Guided Munition', which has the effect of decentralising strategic attack capability (Deptula & Georgulis, 2025). This lowers the barrier to entry, enabling smaller nations and well-resourced non-state actors to access strategic attack capability.

For the ADF, this could mean exploring cost-effective strategic attack options, as well as preparing for a wider array of capable adversaries.

There are also significant economic and asymmetric lessons for Australia from Ukraine. With Australia's position as a 'middle' military power, relying solely on traditional, expensive capabilities creates vulnerability. Ukraine's use of P3GMs against Russia demonstrates how a less-powerful force can apply asymmetric pressure.

The Ukrainian experience highlights the importance of a 'high-low' mix of exquisite (high-

cost) and cheap (low-cost) capabilities. While local manufacturing of high-end missiles is important, not every target requires such a weapon.

Operation Spider's Web demonstrates that affordable mass can yield disproportionately high strategic returns.

This is good news for the ADF, as it seeks to implement the National Defence Strategy's direction to fundamentally re-evaluate procurement, balancing expensive platforms with high-quantity, low-cost, rapidly deployable systems, and to maximise strategic effect per dollar.

It also challenges the traditional understanding of the defence industrial base, requiring the ADF to foster an ecosystem for rapid production and iteration of low-cost solutions.

In an asymmetric context, against a numerically superior adversary, high-end capabilities may be insufficient to create deterrence. However, the ability to inflict significant, unpredictable, and sustained strategic damage with low-cost, high-quantity systems can create a new element of deterrence.

The ADF should consider incorporating the threat of widespread, economically damaging attacks using low-cost uncrewed systems into its deterrence strategy, requiring a re-think of force posture and intelligence gathering, while simultaneously building affordable mass.

Innovation can come through both emerging technologies and in thinking creatively about how to use existing tools. A critical revelation from Operation Spider's Web is that the technology used in the attack drones, explosives, flight controllers, AI, and commercial logistics are globally accessible. The secrecy lay in how it was all brought together and executed.

The non-secret nature of the technology means traditional intelligence gathering focusing on secret weapon programs is less effective. The ADF's intelligence apparatus must shift focus to answering questions like 'how are they integrating readily available technologies, and what are their operational concepts?' This requires ongoing investment in open-source intelligence (OSINT), technical intelligence (TECHINT) on commercial products, and understanding adversary doctrine and innovation (Rovner, 2022).

The rapid pace of evolution of technologies like drones implies a continuous threat evolution. The ADF may need to develop a proactive counter-innovation strategy, anticipating future evolutions of these systems and developing countermeasures before deployment.

This could include shifting research towards agile, rapid prototyping and counter-measure development, and military exercises simulating evolving low-cost uncrewed system threats (Spencer & Joyce, 2025). This includes agility and open-mindedness towards simple, passive countermeasures like camouflage and physical barriers, through to resourcing 'bleeding edge' capabilities such as directed energy. The ADF will need to be involved across the spectrum of UAS technologies if it is to keep pace with countering across the spectrum.

The role of open-source software is crucial, enabling rapid, widespread innovation with readily available technology. This means being aware of, and perhaps engaged with, global open-source communities with innovative user bases. The ADF could explore and contribute to open-source defence projects, potentially releasing non-sensitive code or hardware designs, leading to new policies around open-source adoption and training. The Ukrainian model emphasises military-industry collaboration and rapid, agile development, challenging traditional, bureaucratic defence acquisition cycles.

The low barrier to entry for these technologies means diverse backgrounds can contribute to innovation. The ADF needs to actively seek and integrate talent from non-traditional fields (e.g. hobbyist drone pilots, software developers) through reserve forces, civilian contracts, or hackathons, rethinking recruitment and training to foster an environment where diverse perspectives are valued.

In conclusion, Operation Spider's Web provides a useful point of focus for the ADF as it is

adapting its posture to our challenging strategic circumstances. This daring Ukrainian action demonstrates that strategic effects can be achieved through non-traditional, accessible, and affordable means.

The ADF must pursue a high-low mix of capabilities, investing in low-cost uncrewed systems to achieve affordable mass to saturate adversary defences and creating persistent threats. This has implications for force structure, logistics, and training, moving towards concepts like distributed lethality.

Australia already has significant expertise in uncrewed systems in its sovereign industry; the challenge is how to embed this within the ADF's capability.

Can we learn from Ukraine how to create a national ecosystem for rapid innovation from concept to the battlefield?

Australia's defence strategy has demanded an ADF that is agile, adaptive, and relentlessly innovative; Operation Spider's Web shows that this is possible.

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