Written evidence submitted by Air Street Capital.

Air Street Capital is a London-based venture capital (VC) firm investing a second fund of $121 million in AI-first companies across Europe and the USA.

Air Street is one of a small number of European VC firms that invests in defence start-ups. Following the Russian invasion of Ukraine, the European VC industry expressed a greater openness to defence investment, but this has failed to materialise. We attribute this to a broken market that, as the sole customers, only governments have the power to fix.

Despite a clear and urgent need for AI-first software and hardware, the Ministry of Defence continues to procure technology in the same way it has for decades. Built to allow a handful of defence primes to bid for contracts to build exquisite hardware platforms, the system is not fit for the 21st century. Success for new entrants is conditional on deep pockets, access to insiders, and luck.

As the number of threats to the UK and its allies' national security multiplies, reform of this system should be a top priority for any government. We welcome the opportunity to provide evidence to this Committee and hope its work will contribute to any such reform efforts.

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How clearly has the Ministry of Defence set out its priorities for the kind of AI capacity and expertise it believes the UK defence sector should have, what priorities has it identified, and are these deliverable?

Publicly available strategy work suggests limited familiarity with AI

The MOD's publicly available work on AI suggests an underappreciation of the technology and its implications for defence.

The MOD's operating assumption, based on the Defence Artificial Intelligence Strategy (DAIS) and the 2023 Command Paper (CP) is that AI will be one of a number of capabilities that it will employ, rather than the basis for a new way of operating.

The CP, for example, lists AI as just one of five critical technologies, along with engineering biology, future telecommunications, semiconductors, and quantum. These technologies, while critical to varying degrees, make for poor points of comparison. Unlike AI, they have narrow rather than general applications, are not autonomous, and do not self-improve recursively. A technology like quantum might be useful in a specific context (e.g. in sensing or navigation), but it will not be a horizontal enabling capability like AI.
This approach has resulted in an unambitious approach, which is visible in the DAIS.

For example, the DAIS divides up actions into 'AI Now' (mature technology for immediate adoption) and 'AI Next' ('next-generation' or 'generation after next' capabilities). To drive AI

Next, the MOD says it will "explore the mandating of equipment programmes to be 'AI ready' with an understanding that it may be necessary e.g. for future capital platforms, their sensors and effectors to process at the edge (pattern recognition, command and control, intelligence analysis)".

These are *already* essentials in an electromagnetically contested environment and there is *already* commercial off-the-shelf hardware for edge processing available. The idea of this being a 'next generation' or 'generation after next' capability suggests a lack of familiarity with the field and the status quo. Similarly, the notion that the UK might continue purchasing expensive equipment that will soon be impotent is a recipe to continue falling behind our adversaries while wasting taxpayers' money.

Lack of prioritisation leads to innovation theatre

To date, there appears to have been little thought given to the future shape of any conflict, the capabilities we would need to meet it, and how technology would sit at the heart of our response. This lack of strategic direction has resulted in the MOD deploying a paraply of innovation theatre as an alternative to serious reform.

This takes the form of various innovation units, such as the Defence and Security Accelerator (DASA) and jHub. These organisations often lack meaningful spending power and are unable to pull technology through consistently from experimental grants through to the frontline.

They are also failing to facilitate an ecosystem of UK defence challengers. Air Street analysed every grant awarded by the Defence and Security Accelerator since its inception in 2016. We found that the primary corporate recipients of awards were either (i) large companies with long-standing track records of supplying the MOD (e.g. QinetiQ, Thales, and BAE Systems) or (ii) smaller consultancies or integrators that have carved out a specific contracting niche (e.g. Plextek and Blue Bear Systems).[1] There are vanishingly few examples of start-ups beginning their defence work with DASA and then going on to win large contracts with the MOD outside the programme.

There is an obvious parallel between DASA and the US Department of Defense's Small Business Innovation Research grant programme. This longer-running and better-funded innovation programme played no meaningful role in scaling the success stories of US defence innovation (e.g. Anduril, Palantir, Scale AI, Shield AI, SpaceX) and has instead produced an industry of companies that have optimised for the grant process.

No innovation unit will *ever* be able to correct system-wide challenges or serve as a meaningful alternative to procurement reform.

[1] Our analysis of defence accelerators and contracts can be found here: https://www.airstreet.com/blog/european-defense-procurement

While the MOD points to a widening SME supply base as evidence of success, it is less upfront about where this work is being awarded. Air Street analysed the largest publicly available SME contracts and found that they overwhelmingly covered estate maintenance, basic electronics, clothing, training provision, and oil or lubricants. While important, these are not drivers of innovation and do not deter our adversaries.

What strengths and expertise does UK industry currently have in the field of Artificial Intelligence with defence applications?

Air Street Capital co-produces an annual State of AI Report, covering the major developments across AI research, the industry, politics, and safety.[2] Our work strongly suggests that UK defence lags the capabilities in fields like image and video analysis that we document in our first edition from 2018, which in turn are now significantly behind the state-of-the-art.

This is unsurprising, as the UK has failed to build an ecosystem of defence technology challengers. For context, US-based Anduril's Series E fundraise was larger than all UK defence technology investment combined between 2013 and 2022.[3]

How can the UK Government best develop capacity and expertise within domestic industry in sectors such as engineering and software to support the development and delivery of Artificial Intelligence applications in defence?

What can the Government do to help embed UK AI companies in defence supply chains, both domestically and internationally?

The primary reason innovative companies do not sell to defence is that they believe it to be commercially unviable. They either believe that it will be impossible to break into the market or that there are easier returns to be made elsewhere in the commercial sector.

Fixing this dynamic should be the only focus of a defence AI strategy. New programmes focused on skills or job creation are displacement activities that drain energy and resources away from reform. Ultimately, the role of the defence sector is to equip the UK and its allies to deter conflict and protect sovereignty - not to remedy problems with the education system or to solve regional inequality.

Instead, the UK Government should urgently consider a number of reforms:

- Make the 'AI-ready' mandate explored in the DAIS immediate and identify a path to retiring capabilities that do not currently meet it. The MOD should not be using scarce resources to maintain capabilities that are no longer fit for purpose.

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[2] State of AI Report: https://www.stateof.ai/

[3] UK defence technology investment figure from: https://www.beauhurst.com/wp-content/uploads/2023/04/Beauhurst-UK-Defence-Tech-2023.pdf

- Vehicles like DASA may have some use as a testing ground for immature technology, but this work should only be available to early-stage businesses or academics considering spinouts.
    - Companies that are at Series B stage or later should no longer be eligible for accelerator funding.
    - Participants in the programme also need to be certain that their intellectual property is safe. Primes like QinetiQ should play no role in DASA's operations.
- The intention behind DASA, or other initiatives, such as the Army Warfighting Experiment is noble, but they lack pull-through. Instead, the government should create a new vehicle for procuring advanced technological capabilities. It should be operated by a separate, well-funded, commercially-run organisation, exempt from civil service pay scales and standard procurement rules.
    - This body should be able to define a small set of technological capabilities (e.g. around situational awareness, autonomy, affordable mass) and fund challengers to build and iterate on a minimum viable product.
    - These products should be tested in a competition, with candidates eliminated in rounds and given feedback. Between rounds, remaining competitors should be able to iterate on their product.
    - The winner of each competition should win a significant multi-million pound contract, rather than an exploratory grant or forced partnership with a prime.
- For historic and cultural reasons, the MOD has treated hardware as significantly more important than software.
    - As a result, the software component of a new platform is often procured by default from the hardware manufacturer, even when they lack in-house software or AI expertise. This is in spite of software becoming a crucial source of strategic advantage.
    - To break up this culture of vendor lock-in and substandard software, software-only procurement should move from being the exception to the norm. Technology should conform to mandatory interoperability standards and there should be functioning markets in hardware, software, and systems integration.
- Frameworks such as G Cloud are a key way for innovative businesses to win contracts. However, for reasons of bureaucratic convenience, start-ups are only able to apply to join them during specific windows. As a result, they can be left waiting for years for the opportunity, while the primes benefit from long-term partnership agreements. The MOD should end these entry windows and allow businesses to apply to join at any time.
- Along with acquisition reform, the MOD should consider some of the day-to-day obstacles early-stage companies face:
    - MOD should hold clearances on behalf of start-ups at a cost, as they do for contractors and their own employees. At the moment, start-ups often find themselves unable to win work without clearance, but unable to obtain clearances without work. Businesses end up wasting time and legal fees on byzantine subcontracting arrangements to circumvent this.
    - The security requirements for holding classified information (e.g. those spelt out in the Facility Security Clearance and Policy Guidance) are rightly onerous. While

the MOD provides some facility space for those unable to make the often costly adjustments to their own premises, these are often in remote locations. The MOD should consider establishing a central facility in London and subletting space to start-ups.
    - Similarly, it is understandable that there are secure computing requirements for Official Sensitive, Secret, and Top Secret information, but meeting these can often be expensive and confusing. MOD should consider selling on secure cloud services at cost as well as providing the blueprints to enable self-provision.
- From our conversations across the ecosystem, it is also clear that significant education work is required across the defence establishment, to bring senior leadership up to speed with the state of the art in AI. For example, there appears to be little awareness of advances in techniques like self-supervised or few-shot learning, which remove the need for large labelled training datasets (a common excuse for avoiding innovation).
    - This education would ideally be provided directly by AI researchers or through subsidised university courses, not by organisations with a commercial interest.

16th January 2024