

Written evidence submitted by Thales.

Introduction

Thales is a global defence and technology business operating in three core business segments: Aerospace and Space, Defence and Security and Digital Identity and Security. Worldwide we employ 81,000 people across 68 countries, with over 7,000 people in the UK, across all four nations. The enduring aim of Thales is to exploit technology for the nation's benefit. Our high-tech solutions, services and products help companies, organisations and governments to achieve their goals and ambitions from delivering the UK's passport and driving licenses, being a founding member of the Aircraft Carrier Alliance, and providing the eyes and ears for our Armed Forces through our expertise in optronics and sonar.

Thales is investing heavily in the development of AI-based systems and taking steps to build trusted AI technologies that keep humans at the centre of the decision-making process. In the UK, we are working to couple our deep-rooted Customer and product domain knowledge with our global AI expertise and Trusted, Understandable, Ethical (TrUE) AI strategy, together with continuous collaboration with the AI innovation ecosystem.

Through the UK AI Centre, Thales is forging ahead with significant AI R&D and is leveraging our global AI assets to support the UK businesses in bringing deployable TrUE AI-enabled mission-critical systems to market.

We believe that there is huge potential for AI to support the aims and activities of the UK Armed Forces but there are some structural and cultural aspects to be addressed in order to maximise the impact AI can have, support UK innovation and deliver good value for money.

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?

Generally, the MOD has set out broad priorities and aspirations related to AI capacity and expertise, however, the implementation detail, especially around FLC deployment, could be improved.

To deliver against any AI strategy there are a number of foundational elements (e.g. an AI Reference Architecture) that must be defined to enable enterprise level AI deployment. Some of these foundational elements are discussed at strategic levels within various documents produced by STRATCOM & Defence Digital, but there is a lack of clarity regarding how the strategic work can be realised at an operational level, given the lack of common architectural standards, patterns and interfaces across the defence estate.

Furthermore, systematic, rapid experimentation and deployment of AI is a clear priority but plans are patchy across MOD; for example, the RN has identified priority areas for AI application out to 2025, via their AI Adoption Roadmap, however there is insufficient clarity on the detailed priority operational issues requiring AI solutions. There is also limited visibility of the envisaged scale and pace of AI adoption, and levels of funding targeted for AI, that are necessary to inform multi-year UK defence sector AI capacity and expertise planning and development. Outside of the DSTL R&D programme, AI is not always identifiable within the FLC funding programmes.

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

There is a rich ecosystem of AI expertise in academia, SMEs and in the established UK Defence supply chain. Recognising their stated aim to broaden the supply chain, the MOD could make better use of its established UK defence supply partners to drive forward the adoption of AI in collaboration with this wider ecosystem. Many examples of AI R&D activities are add-on rather than integrated within capability evolution programmes that would accelerate their introduction to the FLCs (See Q5 response below).

UK prime contractors, especially those that can leverage AI from commercial markets, have a unique role to play in helping the MOD to scale-up deployable AI-powered solutions. This is because they have decades of domain knowledge in delivering complex, certified systems to UK MOD; knowledge that

includes target phenomenology, platform integration and operational issues, user needs and the human-machine relationship.

What “pure AI companies” may not understand are the constraints and complexities associated with deployable AI. For example, if you do not understand the physics and the real world limitations of sensor technology, you can’t possibly fully optimise the algorithm to learn from the data it produces: where are the limits where no further advantage in detection would come without improving the sensor itself? Then there is the accountability in military decision making which lead to Rules of Engagement, or of applications that are safety critical.

UK primes have a leading role to play, in partnership with the MOD and the broader AI ecosystem, in delivering deployable AI-powered solutions to operational mission problems and needs.

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?

There is a range of interventions that HMG could make to support the delivery of AI Defence applications, key areas include:

- Explore the potential to “unlock” Defence data through a “Defence Data Marketplace(s)” because without unlocking data there will be no Defence AI. There is huge unrealised potential from focussed collection and brokering of defence data from exercises and operations.
- Define a UK AI Reference Architecture, a common lexicon and a maturity model.
- Define a UK AI Accreditation Authority with an associated capability to do independent testing and V&V. Collectively we need to work much harder on the non-functional enablers (e.g. safety and security) to speed up the development of deployable AI solutions for Defence. Synthetic Environments and Digital Twins are critical for V&V and training and are realistically deliverable, however a clear strategy to align all the various activities across government bodies and military domains has not been clearly presented, and this is a concern given the importance of cross (multi) domain AI deployment cited in the MOD AI Strategy.
- Scale-up initiatives such as Digital Skills for Defence (DS4D) to make AI an attractive career route for apprentices and graduates. Replicate the success of initiatives such as CyberFirst Girls in the AI sector.
- Scale-up efforts on the “Digital Backbone” (an integration across people, process, data and technology), that is a key enabler for deployable AI. There are challenges to deliver this given the significant cultural transformation required and the high profile issues with communications capacity and upgrade programmes.
- Define and share UK MOD AI priorities and roadmaps.
- Define a UK MOD legal framework for use of AI within a Defence context.
- Define a policy on the classification of AI systems, since for an AI system, the classification may change based on the data / model used, but the underlying software may be able to have a lower classification.
- Ensure consistency of the MOD AI Strategy with other related strategies and policies e.g. Cyber Security.

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

The current procurement model needs radical transformation such that continuous mission-driven innovation can be delivered through the Front Line Commands; we need to “out-innovate” all adversaries, continuously, based on an ability to better understand and predict the Mission environment in the age of Digital Transformation. In a world of exponential change in both technology and business models, the innovation ecosystem (including UK AI companies) must be seamlessly embedded within an agile procurement/delivery model where “procurement” starts with joint exploration of suitably framed mission problems.

Of particular urgency (and potential value to UK AI companies) is the need for existing deployed military capabilities to become “AI-powered” where possible, to deliver enhanced operational outcomes for the war-fighter and HMG.

Positive disruption can often happen most quickly and cost effectively through the enhancement and evolution (AI-powering) of existing capabilities. However, often the lack of an effective enterprise around spiral capability development means that monies are instead allocated for “new and revolutionary” capabilities that may or may not deliver on time. Current capabilities, such as cutting-edge sensors, which could benefit from existing advanced AI algorithms, are often held back due to accumulated technical debt that could have been addressed through a better software support / spiral capability enhancement approach.

MOD needs to challenge the enterprise around spiral capability development, and allocate funds to Front Line Commands to specifically deliver “AI-power” through current operational capabilities. This change would align closer to the way in which the commercial sector operates, and would deliver real benefits at pace.

How can the UK Government ensure that it champions the UK AI sector in the context of Pillar 2 of the AUKUS Partnership?

Thales UK believes that the AUKUS opportunity can be a seminal driver for MOD/Industry generational change. The global environment is experiencing significant, dynamic, geopolitical change and at the same time the AI landscape is evolving exponentially in the age of Digital Transformation. The UK MOD/Industry role within AUKUS, if designed correctly, can become the blueprint for a new international defence and security collaboration and delivery model, from research through to operational deployment and sustainment, which increases UK supply chain resilience and delivers enhanced outcomes for HMG.

HMG could position the UK AI Sector through Joint AI Development Initiatives to move from research through to safe and ethical deployable AI solutions.

The UK could lead a unified approach through a common AI Reference Architecture, accreditation process and product/design policy, under new commercial and IP-sharing models, with “open as possible, secure as necessary” cloud-native architectures supporting rapid technology insertion from the international innovation ecosystem. A tri-nation AI software factory could run 24/7 across the different nation time zones using a “follow-the-sun” approach.

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