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Technology's integration in the British Armed Forces:

Enhanced and accelerated training in the 21st century

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Foreword

It is a privilege to introduce this Policy Paper on the integration of advanced technologies, particularly Artificial Intelligence (AI), into the training and education of the British Armed Forces. During my career in the Royal Navy, I have seen how technology transforms operations, enhances decision-making, and reshapes the way we prepare personnel for the complexities of modern conflict.

The Royal Navy has a long tradition of adapting to new challenges. To embrace technological innovation, it is vital to integrate across all domains: sea, land, air, cyber, and space. AI offers the opportunity to create a force that is agile, adaptive, and decisive.

Collaboration with industry, particularly through Project SELBORNE with Capita, has been instrumental in delivering training change. Project SELBORNE demonstrates how AI can personalise learning, generate realistic operational scenarios, and provide

leader-specific performance assessments. By combining Royal Navy expertise with industry nous, we can accelerate adoption, improve readiness, and prepare personnel for the changing character of warfare.

Dr Robert Johnson's study focuses on the relationship between operational experience and strategic vision, providing a roadmap for modern training. It emphasises the importance of cultivating an AI-ready culture, modernising data and Information Technology (IT) infrastructure, and fostering dual-use collaboration to maintain the United Kingdom's (UK) technological edge. Crucially, technology is not a replacement for human judgement, but a force multiplier. It enables faster and better-informed decision-making in complex environments.

As the nature of war continues to evolve, so too must our approach to training and preparation. The insights presented here offer practical recommendations for building modern, integrated, and resilient British Armed Forces.

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Executive summary

CONTEXT

- It is imperative that the British Armed Forces integrate advanced technologies, particularly Artificial Intelligence (AI), into their training and education.[1] The general character of war is exhibiting signs of advanced, autonomous, and integrated systems, transforming otherwise 'dumb' platforms and munitions into part of a lethal net-centric form.

- The United Kingdom (UK), which lacks mass, seeks a decisive technological edge against more sophisticated adversaries. While traditional training methods remain valuable, they should be augmented and, in some areas, completely changed to incorporate AI, so as to prepare personnel for the complexities of modern, all-domain conflict.

- AI provides advantages in training and education by doing the following:
    - Enhancing realism and readiness by simulating complex environments;
    - Personalising learning to individual roles, focusing less on content learning and more on learning to adapt, with real-time prompts for learning during training;
    - Strengthening decision-making through data-driven insights and enhanced situational awareness, and deepening knowledge of friendly forces and enemy forces to create a more accurate range of options through real time simulation in mission rehearsal; and
    - Optimising resource allocation, as well as reducing costs and maximising battlespace efficiency through the precise allocation of limited resources throughout the adversary's battlespace, doing so by exploiting volumes of data that hitherto would have been beyond the computational power to assess or engage.

[1] See: 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).

QUESTIONS THIS POLICY PAPER ADDRESSES:

- What do the British Armed Forces aim to achieve by integrating technology, particularly AI, into their training and operations?
- What technology training currently exists within the British Armed Forces, and how can it be expanded and enhanced?
- What are the benefits to the British Armed Forces of integrating AI into training?

KEY FINDINGS

- The UK has a clear vision for technology-led modernisation.[2] The adoption and integration of autonomous systems will enhance force protection, range, payloads and rates of fire, devolved command, and faster responsiveness of commanders.
- Existing investments in synthetic environments, Virtual Reality (VR), and advanced simulation provide a foundation upon which AI integration can be built.
- AI offers potential across the training spectrum, enabling personalised adaptive learning paths, generating dynamic combat scenarios, providing leader-specific performance assessments for each level of command, and offering an accurate representation of enemy tactics, operational art, and strategic intent.
- Britain can benefit from its allies and partners and learn from its competitors in AI developments and utility, especially in all-domain operations.
- Significant challenges to technology integration persist, including:
    - A deeply ingrained cultural resistance to change, and an insufficiently qualified workforce;[3]

[2] See: 'Defence in a Competitive Age', Ministry of Defence, 22/03/2021, https://www.gov.uk/ (checked: 18/03/2026) and 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).
[3] Ibid.

- Insufficient attention to data quality and security, and underutilisation of data exploitation from 'live' events, training, and rehearsals;
- The limitations of legacy infrastructure, the costs of live ordnance, fuel consumption, and environmental or political opposition; and
- A lack of clarity on AI biases in likely rules of engagement, either in counter-hybrid operations or in full-scale combat operations where the battlespace is congested.

RECOMMENDATIONS

To improve training to incorporate new technology, especially AI, the British Armed Forces should:

1. **Accelerate AI-driven adaptive learning and simulation:** Prioritising investment in AI-powered adaptive learning systems and advanced Synthetic Training Environments (STEs) would enable 'precision training', accelerating skills development, boosting engagement, and preparing personnel more effectively and cost-efficiently than traditional methods.

2. **Cultivate a pervasive, AI-ready digital culture:** Implementing comprehensive, multi-tiered workforce programmes, including AI literacy training, specialised AI skills development, and interdisciplinary education, alongside launching awareness campaigns demonstrating efficiency gains will create a cultural shift, which is essential to overcoming resistance.

3. **Modernise data and Information Technology (IT) infrastructure for AI:** Investing in modernising IT infrastructure; developing data management frameworks that prioritise data security, sovereignty, and quality; building on existing infrastructure for speed; and establishing central data repositories for unified analytics will create a strong backbone for training AI models, enabling real-time decision support, and ensuring the reliability and accuracy of AI applications.

4. **Streamline agile procurement and foster dual-use collaboration:** Empowering the UK Defence Innovation (UKDI) body with the

necessary authority and flexibility to prototype and contract cutting-edge AI, integrating training requirements into procurement cycles, co-investing in Research and Development (R&D) with defence technology companies, funding challenge prizes for faster delivery, and seconding personnel to defence industry will ensure training keeps pace with technological advancements.

5. **Establish clear ethical AI frameworks and human-AI teaming doctrines:** Developing and implementing clear ethical guidelines for AI, and mandating continuous testing and evaluation of AI systems, is paramount to maintaining trust, mitigating risks, and ensuring that AI augments human judgement and accountability in military contexts, rather than undermining it.

1.0 Introduction

Changes in the character of war over the last decade include porosity and greater depth in the battlespace, miniaturisation of combat power, greater automation, dispersal and other means of enhanced force protection, the continued evolution of precision strike (including over greater ranges), and greater use of uncrewed air and maritime systems to augment long-range fires. Cyber and Electromagnetic Spectrum (EMS) warfare – both under the umbrella of Electronic Warfare (EW) – and their countermeasures are evolving, thanks to developments in Artificial Intelligence (AI). The United Kingdom's (UK) military AI sector is growing, estimated at £285 million in 2023 and projected to reach £1.2 billion by 2028.[4]

The Ministry of Defence (MOD) recognises that technology can confer a 'decisive advantage' in future conflicts.[5] In a reflection of the United States' (US) conception of a 'third offset' advantage through technology,[6] Britain seeks to 'modernise and transform' its armed forces.[7] Despite its relatively small size, the UK expects to confront a variety of threat actors across a wide range of geographical and environmental settings. In the event of a major war, it would need to use its existing armed forces to hold the line until new personnel could be brought into action. This too suggests a higher dependency on technology in all domains.

Russia's full-scale invasion of Ukraine has set out a number of challenges, but also provides an example of how to fight in the land, low altitude, and maritime environments. It is less relevant to the deep strike posture that Britain would like to take from a land, sea, and air perspective. Nevertheless, the invasion has been a guide on how Russia, as the UK's nearest peer adversary, would likely fight in the land and air domains. From its own operational design angle, the invasion reinforces the British aspiration to 'process and exploit data at speed [...] vital in

[4] 'Developing AI capacity and expertise in UK defence', Defence Committee, 10/01/2025, https://publications.parliament.uk/ (checked: 18/03/2026).
[5] 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).
[6] 'America's AI Action Plan', The White House, 10/07/2025, https://www.whitehouse.gov/ (checked: 18/03/2026).
[7] 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).

enabling it to fight and win on land in the 21st century.'[8] The British Armed Forces are eager to adopt the latest advances in data and digital technology to maintain their competitive edge.

The challenge has arisen due to the British Armed Forces' focus on counter-insurgency and counter-terrorism during the thirty years since the end of the Cold War, rather than high-end war. They have fallen behind on investments in equipment and forces for conventional war, they lack mass, and they do not possess the heavier payloads and greater ranges they need to inflict a defeat on peer enemies. The lack of capability, the imminence of the Russian threat, the likelihood of Iranian threat, and the speed with which Russia is acquiring combat experience and mass production in materiel have created a sense of urgency. The continuous advancements by the People's Republic of China (PRC) in AI, and the likelihood of tech transfer to a variety of adversaries, is driving the UK towards the adoption of tools for all-domain warfare. This in turn requires a rigorous assessment of the gaps, capabilities, and needs for the whole of the British Armed Forces.

It is worth noting that 80% of the world's commercial robots are manufactured in the PRC; a country that leads in drone development, builds five times more munitions than the US, and leads in military-grade Uncrewed Aerial Systems (UAS).[9] In other words, the PRC is outpacing the UK in AI integration, and the imperative for the British Armed Forces is to catch up and surpass the People's Liberation Army (PLA) and the People's Liberation Army Navy (PLAN) in terms of integration and deployment of AI. Doing that starts with accelerated training and education.

[8] The MOD's Defence Command Paper from 2021, 'Defence in a Competitive Age', further illuminated this shift, stating that the future battlefield will be defined less by the physical environment and more by the technological advances being made by Britain's adversaries. See: 'Defence in a Competitive Age', Ministry of Defence, 22/03/2021, https://www.gov.uk/ (checked: 18/03/2026).

[9] 'China overtakes USA in robot density', International Federation of Robotics, 05/12/2022, https://ifr.org/ (checked: 18/03/2026). For the war capacity of the PRC compared to other nations against the metric of robotic density in manufacturing, see: 'More than 4 million robots are working in factories worldwide', *The Business Times*, 24/09/2024, https://www.businesstimes.com.sg/ (checked: 18/03/2026).

2.0 Britain's vision: Alignment of the Defence Technology Framework and digitisation

The UK's response to the evolving threats has been articulated through key policy documents. The Defence Technology Framework (DTF) of 2019 stands out as one of the first statements of the MOD's 'technology-led modernisation' approach.[10] This was subsequently made more imperative by the publication of the Strategic Defence Review (SDR) in June 2025, which aims to drive the adoption of cutting-edge technologies such as AI, quantum technologies, and advanced electronics into front-line service.[11] The SDR emphasises the need to blend suitably qualified and experienced personnel, knowledge, facilities, and industrial capacity to develop these cross-cutting assets.

Complementing this, the British Army's 'Digital and Data Plan 2023-2025' outlines a comprehensive strategy to create a 'modernised digital Army'.[12] This plan is not merely about acquiring new hardware, but the transformation of the whole force in line with the MOD's THEIA programme; a long-term relationship with the tech industry, academia, and international allies.[13]

Central to this vision is the development of a 'digital workforce' that is 'empowered, skilled, and agile'.[14] The Digital and Data Plan calls for the British Army to 'grow and retain new skills' and to 'adapt and adopt a growth mindset and digital culture', empowering its personnel to train and deploy their digital skillsets. This includes specific initiatives to increase knowledge of AI and Machine Learning (ML), the basics of data

[10] 'Defence Technology Framework', Ministry of Defence, 09/09/2019, https://www.gov.uk/ (checked: 18/03/2026).
[11] 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).
[12] 'The Army Digital and Data Plan 2023-2025', British Army, 18/04/2023, https://www.army.mod.uk/ (checked: 18/03/2026).
[13] 'Army Digitalisation: The THEIA programme', Ministry of Defence, 27/11/2020, https://www.gov.uk/ (checked: 18/03/2026).
[14] 'The Army Digital and Data Plan 2023-2025', British Army, 18/04/2023, https://www.army.mod.uk/ (checked: 18/03/2026).

science, specialist courses, and an effort to attract talent from the tech industry.

The Defence Command Paper of 2021 and Defence Command Paper Refresh of 2023 further reinforce this direction across all the armed services, articulating a future where military capability 'will be less defined by numbers of people and platforms than by information-centric technologies, automation, and a culture of innovation and experimentation'.[15] To support this, the MOD also published the 'Digital Strategy for Defence' in 2021, which is designed to put 'career management in the palm of people's hands through digital applications'.[16] This comprehensive emphasis on digital literacy and cultural transformation suggests that simply acquiring technology is insufficient for successful integration: it is a question of education and incentives as well as integration.

There are, however, several obstacles to such successful integration. The hierarchical and conservative nature of defence, often characterised by a lack of incentives for taking risks (a hallmark of a small or shrinking force), impedes innovation. Therefore, a fundamental cultural shift, initiated from leadership and permeating down to individual soldiers, aircrew, and sailors, is recognised as a crucial prerequisite for the effective integration of AI into training and subsequent operations. Without this underlying cultural adaptation, investments in technology risk being underutilised or even actively resisted, potentially undermining the objectives.

There is a risk of underinvestment in skills training, not least as more money has been poured into standard pay structures for the existing salary spine, missing a golden opportunity for transformation. The lack of instructors and tech specialists, and a heavy reliance on traditional education and training methods, such as large-scale exercises, small unit training, trade training modules, classroom instruction, and set-piece courses at the UK Defence Academy and service institutions, further deters a radical transformation of the British Armed Forces' 'analogue' culture.

On the other hand, there are 'green shoots' of development. At a tactical level, individuals are being encouraged to use AI and become

[15] 'Defence in a Competitive Age', Ministry of Defence, 22/03/2021, https://www.gov.uk/ (checked: 18/03/2026) and 'Defence Command Paper 2023: Defence's response to a more contested and volatile world', Ministry of Defence, 18/07/2023, https://www.gov.uk/ (checked: 18/03/2026).
[16] 'Digital Strategy for Defence', Ministry of Defence, 27/05/2021, https://www.gov.uk/ (checked: 18/03/2026).

familiar with areas that have a low technical bar to entry, such as operating UAS. Specific centres have been established, including the British Army's Innovation branch and the Defence BattleLab.[17] Moreover, Large Language Models (LLMs), with ever-increasing powers of compute, may make traditional forms of training obsolete, if forecasts are correct. AI itself is able – and will increasingly have the capability – to perform many tasks that are currently cycled back to humans, such as writing code to fix problems in software or to ensure modulation in frequency selection, in turn to ensure an efficient Electronic Counter-Countermeasure (ECCM) process in real time.

The Digital Strategy for Defence serves as a vital mechanism for embedding this cultural shift directly into the career progression and daily lives of military personnel, fostering digital literacy and a proactive approach to technological change. While the British Armed Forces find themselves competing with the private sector in recruiting and retaining the most accomplished data engineers and programmers, they retain a significant 'value added' experience for civilians. Soon, where once the British Armed Forces required training of humans, they will benefit from systems that make certain training irrelevant: AI will be able to develop and deliver battlespace requirements; direct automated systems; and conduct more efficient Intelligence, Surveillance, and Reconnaissance (ISR).

[17] See: 'Army Innovation', British Army, No date, https://www.army.mod.uk/ (checked: 18/03/2026) and 'About the BattleLab', Defence BattleLab, 2025, https://defencebattlelab.com/ (checked: 18/03/2026).

3.0 Current British Armed Forces training and technology integration

Traditional training within the British Armed Forces has historically relied on established, rigorous methods designed to build fundamental military skills and tactical proficiency. The British Army's Infantry Battle School, for instance, employs an 'immersion' training approach, progressing through a sequence of 'explain', 'demonstrate', 'imitate', and 'act'. Theoretical instruction is reinforced through Tactical Exercises Without Troops (TEWTs), which bridge the gap between classroom theory and practical field application.

This structured approach is evident across various training phases, from basic training, or 'Phase One' – which covers foundational military skills, fitness, and ethos for all new recruits – to Initial Trade Training (ITT) and Subsequent Trade Training (STT) for specialised roles. Officer training, delivered through a series of modules, systematically builds competencies in tactics, leadership, and operational doctrine. Officers attend special-to-arm training after their initial training, appropriate to their arm, branch, or service. The Royal Navy and Royal Air Force (RAF) operate different approaches, with a stronger emphasis on technical and engineering themes, but the models of basic training, progression training, officer education, specialist courses, and branch-specific courses are the same.

While these traditional methods are indispensable for instilling core competencies, cohesion, leadership, and discipline, they possess inherent limitations in terms of scale, complexity, and real-time adaptability in technical training. Live-fire training, although vital, is resource-intensive, constrained by physical space, and carries inherent risks.

However, these obstacles create significant opportunities for AI to augment established methodologies, rather than replace them. AI can introduce hyper-realistic scenarios, provide adaptive feedback tailored to individual performance, and generate data-driven insights that are impractical or impossible to achieve with purely traditional, resource-intensive, live training.

The existing 'immersion' approach to training, which seeks to engage trainees deeply, naturally aligns with the capabilities of Virtual

and Augmented Reality, which AI can enhance further by introducing dynamic and intelligent elements. Examples would include decisions over simulated firefighting aboard ships, dispersal and replenishment of individual fighter aircraft, or close-quarters battle in urban environments.

3.1 Existing digital, synthetic, and Virtual Reality training capabilities

The British Armed Forces are keen to embrace training that incorporates the lessons learned from Ukraine, and to enhance their prowess in combat using new technologies. They recognise that not all training can consist of live-fire drills, and that there are advantages in using simulators, both to generate data to train ML processes and to give personnel real-time feedback on performance. Technology is already revolutionising how troops prepare for combat, with Synthetic Training Environments (STEs), Virtual Reality (VR), and simulation technologies in use. Significant investments and deployments in these areas, which should be continued, include the following:

- **Integrated Indirect Fire Simulation (IIDFS):** Elbit Systems UK secured a contract in 2023 to develop and provide artillery and mortar training simulators for the British Army.[18] This system uses simulated ammunition and a high-tech interface for live communications between instructors and personnel, enhancing indirect fire training.

- **Joint Fires Synthetic Trainer (JFST):** This system delivers high-fidelity immersive training for Joint Fires Operators, including a 285° dome for Joint Terminal Attack Controller (JTAC) training.[19] With US and North Atlantic Treaty Organisation (NATO) accreditation, JFST has already delivered over 12,000 hours of training to British and allied forces, enabling mounted, dismounted, and battlegroup-level exercises.

[18] Giles Ebbutt, 'Elbit Systems UK showcases indirect fire simulators', *Janes*, 20/03/2025, https://www.janes.com/ (checked: 18/03/2026).
[19] John Hill, 'Elbit Systems UK's Joint Fires Synthetic Trainer reaches IOC', *Army Technology*, 28/09/2023, https://www.army-technology.com/ (checked: 18/03/2026).

- **Interim Combined Arms Virtual Simulation (Deployed) (ICAVS[D]):** Benefitting the British Army since 2022, ICAVS(D) provides high-quality immersive tactical training using high-specification hardware and Defence Virtual Simulation Software (DVS2).[20] Its expeditionary potential has been demonstrated in European deployments such as Operation CABRIT, complementing subsequent live field training exercises effectively.

- **Project VULCAN:** Contracted in 2023, this project involves the design, provision, maintenance, and operation of the Ground Manoeuvre Synthetic Trainer (GMST) system for Boxer Armoured Fighting Vehicles (AFVs) and Challenger 3 tanks.[21] It provides a realistic STE to qualify crews before operating these complex platforms.

- **Project SELBORNE (Royal Navy):** This comprehensive programme is transforming education and shore-based training for sailors and marines.[22] Elbit Systems UK acts as the synthetic integrator, continuously upgrading existing systems and introducing new simulation situations, including a VR Flight Deck Marshalling system.

- **Virtual Reality in Land Training (VRLT):** A pathfinder project for the Collective Training Transformation Programme (CTTP), VRLT leverages Bohemia Interactive Simulations (BISim) technology. Soldiers use VR headsets to engage in virtual land combat against 'AI-controlled enemy forces', such as counterattacking a village. This immersive simulation significantly increases engagement and focus, better preparing soldiers for live training. The VBS4 software used in VRLT scales to train over 90 personnel, simulating complex environments with artillery, close air support, and naval gunfire, and utilises a whole-earth terrain database for training anywhere on the planet.[23]

[20] 'Elbit ICAVS(D) Now In Service With British Army', *Joint Forces*, 27/04/2022, https://www.joint-forces.com/ (checked: 18/03/2026).
[21] Giles Ebbutt, 'Project Vulcan targets comprehensive simulation capability for British Army armour', *Janes*, 27/06/2023, https://www.janes.com/ (checked: 18/03/2026).
[22] Norbert Neumann, 'Team Fisher reaches first milestone in Royal Navy training modernisation', *Naval Technology*, 19/10/2021, https://www.naval-technology.com/ (checked: 18/03/2026).
[23] Sam Sprigg, 'BISim to work with British Army on second phase Virtual Reality In-Land Training program', *Auganix*, 02/12/2020, https://www.auganix.org/ (checked: 18/03/2026).

The widespread adoption of VR across all three services (British Army, Royal Navy, and RAF) for combat simulations, medical training, driving, and flight simulation has proven to be more cost-effective than traditional training methods.[24] There is an existing infrastructure for synthetic, VR, and simulation capabilities, meaning the British Armed Forces could enhance their digital environment for advanced AI integration.

The overarching concept of a STE aims to merge live, virtual, constructive, and gaming platforms into an interoperable training experience. This represents the ideal framework into which advanced AI applications can be embedded. This approach minimises the need to build entirely new systems from the ground up, thereby accelerating the adoption and deployment of AI in training.

On the other hand, not all training architecture currently utilises AI or advanced technology. Much training does not have the facilities to ensure machine learning can take place, in part because of concerns about operational security and a lack of trust in 'delicate' systems in the robust settings of combat.

3.2 Current British initiatives and innovation to build upon

The UK has initiatives to accelerate the adoption of defence technology, which can be emulated to enhance training. The UK Defence Innovation (UKDI) body, launched in July 2025 with a ring-fenced annual budget of at least £400 million, is tasked with centralising and streamlining military innovation efforts, creating a pathway from prototypes to deployable capabilities through flexible procurement mechanisms.[25] This includes a Rapid Innovation Team focused on deploying commercially available solutions at 'wartime pace', and Regional Engagement Teams to identify promising ideas from Small and Medium Enterprises (SMEs) and academic spin-outs. A similar model could be used to attract or engage tech talent for training purposes.

The Defence Science and Technology Laboratory (DSTL) plays an important role, providing 'world-class capability in applying Artificial

[24] 'VR Training Cost Analysis and ROI: Worth the Investment?', *Immersive Learning News*, 01/11/2024, https://www.immersivelearning.news/ (checked: 18/03/2026).
[25] Sophie Hogan, 'New UK Defence Innovation fund gets £400m ringfenced budget', *Research Professional News*, 26/03/2025, https://www.researchprofessionalnews.com/ (checked: 18/03/2026).

Intelligence, data science, and machine learning to defence and security challenges.'[26] DSTL collaborates with international partners, including AUKUS (a trilateral partnership between the UK, US, and Australia) and the US Air Force Research Laboratory (AFRL). This collaboration has led to the testing of AI-enabled Uncrewed Aerial Vehicles (UAVs) for targeting, and the integration of AI on Royal Navy ships for threat detection and rapid hazard assessment during exercises such as FORMIDABLE SHIELD 2025.[27] Furthermore, DSTL and AFRL have jointly developed and deployed an 'AI toolbox' in such military exercises, focusing on making AI agile, adaptable, trustworthy, and accessible to troops, including the use of 'model cards' to help commanders understand the limitations of current ML models. The Elastic Compute Cloud (EC2) AI-enabled headquarters is another valuable example, demonstrating how a brigade command team can be reduced in number but become more effective, and where training is enabled by an intuitive system.[28]

At the operational education level, the Defence Academy's Advanced Command and Staff Course (ACSC) is already exploring the use of AI to augment traditional teaching and learning methods. This is currently limited to wargaming, but the scope is considerable. There would be considerable value in devolving the process of learning tactical and operational options, deception measures, and EW, as well as having AI as both the adversary and the evaluation tool to coach the next generation of leaders, avoiding obvious errors and pattern-setting while rehearsing ways to outmanoeuvre and outwit sophisticated enemies. These can be conducted at different levels, including brigade, air station, and individual ship's companies.

While innovation bodies such as UKDI and DSTL are focused primarily on developing and rapidly deploying operational capabilities, their activities inherently generate a substantial requirement for new training. For example, the testing of AI-enabled UAVs or the integration of AI on naval vessels directly necessitates that military personnel be

[26] 'AI and data science: Defence science and technology capability', Defence Science and Technology Laboratory, 09/08/2021, https://www.gov.uk/ (checked: 18/03/2026).
[27] 'Joint Integrated Air and Missile Defence Exercise FORMIDABLE SHIELD 2025 Underway', North Atlantic Treaty Organisation, 07/05/2025, https://ac.nato.int/ (checked: 18/03/2026).
[28] Details of the system remain sensitive, but for an outline of the concept, see: Jane Walker and Lucy Smeddle, 'Decision-making: How do human-machine teamed decision-makers, make decisions?', Development, Concepts, and Doctrine Centre (DCDC), 10/05/2024, https://assets.publishing.service.gov.uk/ (checked: 18/03/2026).

trained not only to operate these advanced systems, but also to collaborate with them effectively.

UKDI's mandate to accelerate deployment implies a corresponding pressure to train personnel rapidly on newly adopted technologies. Consequently, training becomes a critical bottleneck if not addressed, and solutions should be integrated into the development and procurement cycles of these innovation bodies. Specialist skills training could be an integral part of the exchange between the private sector, UKDI engagements, and DSTL initiatives (see: Table 1).

TABLE 1: BRITISH DEFENCE AI AND INNOVATION INITIATIVES RELATIVE TO TRAINING

Initiative name	Lead organisation and partners	Key focus and mandates	Specific relevance to training and workforce development
DTF	MOD	Provide a strategic assessment of essential technologies to drive modernisation and transform military capabilities.	Emphasises 'people' and 'knowledge' as critical capabilities for exploiting technologies including AI, and underpins the need for an AI-ready workforce.
British Army Digital and	British Army	Create a modernised	Focuses on developing a

Data Plan[29]		digital army, capitalising on data and digital technology for competitive advantage.	'digitally fit' and 'empowered' workforce, growing new digital skills, and fostering a digital culture; includes plans for digital foundation, cyber, and data training.
UKDI	MOD	Centralise and accelerate military innovation, simplify fragmented processes, and fund development and deployment of advanced technologies.	Accelerates the adoption of cutting-edge technologies, creating an urgent need for rapid training of personnel to operate and integrate these new capabilities.
DSTL	MOD	Create a world-class capability in applying AI, data science, and ML to defence and security	Develops and tests AI technologies (e.g., AI toolbox, AI on Royal Navy ships, and AI-enabled

[29] This is constantly updated, not least by operational feedback from Operation SCORPIUS and Ukrainian experience.

		challenges, research, development, and operational support.	UAVs) directly with the British Armed Forces, necessitating training on these systems and their limitations, and collaborates on joint training and deployment of ML algorithms.
VRTL	British Army, BISim	Provide a pathfinder project for CTTP, leveraging VR for immersive land training.	Uses 'AI-controlled enemy forces' to create realistic and engaging virtual training environments for collective training at various scales.
Project SELBORNE	Royal Navy, Team Fisher (Capita-led), Elbit Systems UK	Transform education and shore-based training for sailors and marines.	Elbit Systems UK acts as synthetic integrator, introducing new and upgraded simulation systems, including VR,

			to enhance naval training and readiness.
ACSC[30]	Defence Academy	Provide senior military education, exploring key defence concepts and strategic challenges.	Actively encourages course members to explore and exploit AI to augment their methodology, fostering AI literacy and strategic thinking among future leaders.

[30] This Policy Paper recommends rapidly devolving this into sub-units.

4.0 Leveraging AI for transformative training methods

The integration of AI into military training will move the British Armed Forces beyond traditional methods to create highly effective, adaptive, and realistic preparations for a variety of operational scenarios. In 2024, the most advanced AI achieved an 87% success rate in tasks it had not encountered before, in contrast to the best human performance of 85%.[31] Industry specialists forecast that this rate of improvement will accelerate over the next two years.

According to Stanford University's annual 'Artificial Intelligence Index Report', AI exceeded human ability to conduct image classification in 2015, followed by basic level reading comprehension, known as SQUAD 1, in 2018. English language understanding continued to develop, and by 2020, AI had achieved parity with humans. The following year, AI exceeded human abilities in visual reasoning. In 2023, multitask language understanding matched humans, while vast strides were made in just 12 months in competition-level mathematics.

Published in April 2025, the Artificial Intelligence Index Report goes on to note that AI exceeded humans in competition mathematics by the middle of 2023, matched humans in multi-modal understanding the same year, and exceeded PhD-level answers in scientific questions.

AI is better than humans at calculations, processing, and repetitive tasks. It is therefore well suited to 'sentry' roles, requiring long hours of vigilance over screens or in physical alertness. It is faster at calculations for targeting and fires, navigation decisions, and logistics, and is already integral to enabling autonomous and robotic weapon systems.

4.1 Adaptive learning paths and personalised skill development

AI-powered adaptive learning systems represent a significant leap forward in military education. These systems utilise ML algorithms to analyse trainee performance meticulously, identifying individual

[31] James Fell, 'Stanford just released its annual AI Index report. Here's what it reveals', World Economic Forum, 26/04/2024, https://www.weforum.org/ (checked: 18/03/2026).

strengths, weaknesses, and knowledge gaps in real time. Based on this continuous assessment, AI dynamically adjusts training modules, content, pace, and delivery, ensuring a truly personalised learning experience. For instance, if a soldier struggles with a particular tactical concept, AI can automatically provide additional remedial resources or alternative explanations, while a proficient trainee might be presented with more advanced material.

This tailored approach offers numerous advantages, including a more engaging and relevant learning experience, increased information retention, and significantly faster skill development by focusing only on areas requiring improvement. It also contributes to cost efficiency by optimising training time and resources, and provides real-time insights for instructors and commanders through dashboards that track both individual and unit progress. The scalability of AI-driven adaptive learning makes it ideal for large or geographically dispersed workforces, enabling world-class training with minimal additional cost once implemented.

Beyond merely tracking performance, AI-based multi-modal physiologic sensor fusion can unobtrusively measure predictors of performance, with the explicit goal of accelerating training timelines and producing, for example, better pilots at a faster pace. This capability signifies a shift towards precision training, where resources are allocated to individual needs, thereby accelerating skill development and achieving proficiency more rapidly. This AI coaching is critical when new skills may be required. Crucially, it is also the most effective way for AI to learn how humans react in real situations, and how scenarios play out.

4.2 Dynamic scenario generation and intelligent adversaries

AI is revolutionising the creation of training environments by enabling 'intelligent, scenario-based simulations that evolve according to trainee responses.'[32] This capability allows for highly realistic and unpredictable training experiences. For example, if a soldier hesitates during a simulated ambush, the AI can escalate the threat or alter the behaviour of virtual adversaries to increase pressure, thereby building critical thinking and rapid response capabilities in unpredictable situations. The same

[32] 'How AI and XR Are Redefining Military Training', Yord, 31/03/2025, https://yordstudio.com/ (checked: 18/03/2026).

method can be used in Anti-Submarine Warfare (ASW) settings, or in encountering Anti-Access/Area Denial (A2/AD) environments in the air domain.

AI-powered adversaries provide more realistic training for personnel than traditional scripted exercises. The US Air Force, in collaboration with the US Department of War's Defence Advanced Research Projects Agency (DARPA), has successfully employed AI to fly fighter aircraft in simulated dogfights, with AI agents even outperforming veteran human pilots in aerial duels. DARPA's COMBAT programme specifically focuses on developing AI algorithms to generate sophisticated 'Red Force' brigade behaviours, which challenge and adapt to 'Blue Forces' in simulations. These AI adversaries can react in ways 'not easily replicated by human roleplayers', stimulating the development of new Blue Force tactics and encouraging moves away from predictable patterns.[33]

Generative AI (GenAI) further enhances this by creating 'dynamic combat scenarios for ground troops', which can assist in the design of wargame scenarios.[34] It can run 'countless computer simulations with AI red teams' to evaluate various tactical responses.[35]

A notable example is the German Army's collaboration with HGXR, an Extended Reality (XR) solutions company, which integrates AI into XR military training. This initiative focuses on developing 'advanced behaviours from Non-Player Characters (NPCs) and Large Language Models (LLMs)' to control complex sequences, generate dynamic scenarios, and facilitate realistic conversations via AI chatbots, even for sensitive situations such as dealing with suicide bombers.[36] AI can also simulate 'coordinated group behaviour', making previously resource-intensive scenarios feasible and efficient.

The ability of AI to generate dynamic scenarios and intelligent adversaries introduces realism into exercises and wargaming. Traditional wargames are often limited by human biases and the sheer inability to process vast amounts of data, or to generate dynamic and responsive scenarios. AI-driven systems overcome these limitations, forcing human

[33] 'COMBAT: COnstructive Machine-learning Battles with Adversary Tactics', Defence Advanced Research Projects Agency, No date, https://www.darpa.mil/ (checked: 18/03/2026).
[34] Ibid. See also: John Keller, 'Researchers eye embedding Artificial Intelligence (AI) into war games simulation to beef-up challenges', *Military and Aerospace Electronics*, 03/06/2020, https://www.militaryaerospace.com/ (checked: 18/03/2026).
[35] Ibid.
[36] Antonina Rafikova and Anatoly Voronin, 'Human-chatbot communication: A systematic review of psychological studies', *AI and Society*, 40:7 (2025).

participants to adapt in real time to evolving dilemmas, thereby mirroring the chaos and uncertainty inherent in operations.

This capability transforms training from mere simulation to true tactical foresight, enabling armed forces to fight an adversary force repeatedly to find a key to winning the battle and to inform human planners about alternative realities, ultimately leading to better-trained personnel.[37]

4.3 AI-powered performance assessment and feedback

AI enhances the precision and objectivity of performance assessment in military training significantly. It enables precise tracking of trainee performance, and the recording and analysing of every movement, decision, and reaction to inform and adjust future training modules. This granular level of insight is often impossible to achieve in traditional exercises. By analysing vast amounts of data from training exercises and simulations, AI and ML provide deeper insights into soldier performance and training efficacy.

This data-driven approach allows for the tailoring of subsequent training modules to address specific needs, ensuring personalised development for each individual. After this, AI-driven analytics can evaluate the behaviour of opposing forces, identifying recurring patterns that may indicate future adversary movements and enabling the development of more effective countermeasures. Furthermore, computer vision technology is being investigated as a potential replacement for current laser-based systems, such as the Instrumentable-Multiple Laser Engagement System (I-MILES), used in live force-on-force training with the aim of significantly improving the realism and objectivity of combat simulation and assessment.[38]

The capabilities of AI in performance assessment fundamentally shift the paradigm from reactive, post-action reviews to proactive, real-time iterative improvement. The continuous, objective data collection and analysis enable immediate feedback and dynamic

[37] Peter Layton, 'Fighting Artificial Intelligence Battles: Operational Concepts for Future AI-Enabled Wars', Centre for Defence Research, 01/2021, https://www.researchgate.net/ (checked: 18/03/2026).
[38] See: 'Alliance is the Engine for Training Transformation', Lockheed Martin, 28/12/2023, https://www.lockheedmartin.com/ (checked: 18/03/2026).

adjustments to training, creating a virtuous cycle of learning and refinement.

This 'data-driven readiness' means that commanders gain actionable insights into personnel preparedness, facilitating smarter deployment and more effective resource allocation, and enabling training to continue when call signs are deployed – for example, at sea, on NATO's eastern flank, or in US Central Command. The integration of advanced technologies such as computer vision further enhances assessment in dynamic training environments.

4.4 Enhanced decision support and wargaming

AI is increasingly becoming indispensable for assisting commanders in making 'faster and smarter decisions' on the battlefield. AI systems can fuse intelligence from diverse sources, such as satellite imagery, intercepted communications, and reconnaissance data, to provide a comprehensive, near real-time operational picture and recommend optimal actions. The US Army, for example, aims to leverage such tools to enable units to make '1,000 high-quality decisions…on the battlefield, in one hour', a tempo impossible without automation.[39]

Beyond real-time operations, AI can create realistic simulations of these situations to help leaders evaluate the outcomes of different options before committing a force to a single course of action. AI-powered wargaming platforms can recreate real-world combat scenarios, assess different strategies, and analyse potential outcomes, thereby refining tactics and improving overall preparedness. The NATO Science and Technology Organisation (STO) has tested the Augmented Near real-Time Instrument for Critical Information Processing and Evaluation (ANTICIPE) system, which combines AI with Command and Control (C2), and features a built-in wargaming tool and advanced ML algorithms specifically designed to aid decision-making in complex operational settings.[40]

Predictive analytics, leveraging AI and ML algorithms, can forecast future requirements, identify potential disruptions, and optimise resource

[39] Abhishek Bhardwaj, '1,000 hits per hour: US Army's AI system to get smarter, speedier, deadlier', Interesting Engineering, 22/08/2024, https://interestingengineering.com/ (checked: 18/03/2026).
[40] Joint Force Development Experimentation and Wargaming Branch 2023 Fact Sheet – Human Considerations in Artificial Intelligence for Command and Control: Augmented Near real-Time Instrument for Critical Information Processing and Evaluation (ANTICIPE)', NATO Allied Command Transformation, 2023, https://www.act.nato.int/ (checked: 18/03/2026).

allocation in logistics. This enhances decision-making and enables proactive responses to threats and challenges in contested environments. Furthermore, AI can ingest real-world streaming data from social media via distributed sensors across the globe, processing petabytes of information with cloud computing and Graphics Processing Units (GPUs) for real-time analysis and near-instantaneous feedback in wargames. This capability collapses the timeframe for insights from weeks or months to near-instantaneous feedback.

The core benefit of AI in decision support is achieving a significant decision advantage. By accelerating the 'observe' and 'orient' phases of the Observe, Orient, Decide, Act (OODA) loop,[41] and providing comprehensive multi-scenario analysis, AI empowers commanders to make faster, more accurate, and more informed decisions. This extends beyond mere speed to encompass the quality and 'fit' of decisions, enabling pre-emptive actions that can disrupt an adversary's decision-making cycle. It would therefore be a route to 'mission command', because senior commanders would trust better-trained junior leaders who had been subjected to this more intense form of training.

Training with AI-enhanced decision support systems is therefore critical to building trust and proficiency in this augmented decision-making process, ensuring that humans remain in the loop and understand the benefits, risks, and limitations of these complex technologies (see: Table 2).

TABLE 2: KEY AI APPLICATIONS AND BENEFITS IN ARMED FORCES TRAINING

AI application area	Specific AI capabilities	Direct benefits for training and personnel	Impact on overall proficiency
Adaptive learning	ML algorithms analyse	Personalised skill development;	Accelerates proficiency; optimises

[41] Brett Crowley, 'The OODA Loop', The Decision Lab, No date, https://thedecisionlab.com/ (checked: 18/03/2026).

	performance and adjust modules; AI tailors content, pace, and delivery.	increased engagement and retention; faster skill acquisition; and targeted remedial and advanced support.	resource allocation for individual needs; and ensures continuous upskilling.
Dynamic scenario generation and intelligent adversaries	AI creates evolving scenarios; AI-powered adversaries (red teams) adapt to trainee actions; GenAI generates diverse combat scenarios.	Hyper-realistic, unpredictable training builds critical thinking and quick responses, forces adaptation to evolving threats, and provides novel tactical insights.	Enhances strategic foresight; develops more robust and adaptable strategies; and prepares for complex, multi-domain conflict.
AI-powered performance assessment and feedback	AI tracks movements, decisions, and reactions, and analyses vast data; computer vision for live training assessment.	Precise, objective performance data; real-time feedback; identification of strengths and weaknesses; and tailored future training modules.	Enables iterative improvement, data-driven readiness, smarter deployment, and resource allocation decisions.
Enhanced	AI fuses	Faster,	Achieves

decision support and wargaming	intelligence and recommends actions, simulates outcomes, and provides predictive analytics for logistics.	smarter, and more accurate decisions; evaluation of strategies without commitment; and improved preparedness for various scenarios.	'decision advantage'; enables proactive responses; and streamlines C2 in complex environments.

5.0 Enabling factors and overcoming challenges for AI integration

The successful integration of AI into the British Armed Forces training hinges on addressing several critical factors, which must overcome persistent obstacles. These include workforce development, data management and infrastructure, procurement and industry collaboration, and ethical considerations.[42]

5.1 Workforce development: An AI-ready digital culture and skills base

A foundational requirement for training the British Armed Forces is the cultivation of an AI-ready workforce and a pervasive digital culture. The SDR aims to embed digital literacy into all aspects of the services' activities.[43]

The House of Lords 'AI in Weapon Systems Committee report' on defence AI underscores the necessity for it to become an integral part of military education, and for mechanisms that facilitate the movement of AI specialists between the civilian and defence sectors to be established.[44] This is crucial given the MOD's projection of a 25% growth in demand for AI expertise in defence over the next decade.[45] Unfortunately, the laborious 'on-boarding' process in the civil service, and

[42] For comparison, see: 'America's AI Action Plan', The White House, 10/07/2025, https://www.whitehouse.gov/ (checked: 18/03/2026).
[43] 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).
[44] Thomas Brown, 'AI in Weapon Systems Committee report: Proceed with caution', House of Lords Library, 10/04/2024, https://lordslibrary.parliament.uk/ (checked: 18/03/26). For His Majesty's (HM) Government's response, see: 'Government response to the House of Lords AI in Weapon Systems Committee Report', Ministry of Defence, 19/02/2024, https://www.gov.uk/ (checked: 18/03/2026). For the House of Commons report and HM Government's response to it, see: 'Developing AI capacity and expertise in UK defence', UK Parliament, 10/01/2025, https://publications.parliament.uk/ (checked: 18/03/2026).
[45] 'Artificial Intelligence sector study 2023', Department for Science, Innovation, and Technology, 23/10/2024, https://www.gov.uk/ (checked: 18/03/2026). This includes a structured breakdown of the value added and workforce allocation of staffing linked to AI development.

its culture that inadvertently resists change, precludes this agility in personnel transfer.[46]

While the space available to this Policy Paper does not allow for a full comparative study, the UK could learn from the US Army's emphasis on encouraging 'fluency in AI at all levels' and teaching managers to 'challenge presumptions, analyse data, and work in sync with IT [Information Technology] and software engineers', which provides inspiration for a greater tech literacy in the British Armed Forces.[47] Similarly, France's Cyber Defence Academy, transformed to train skilled cyber fighters, demonstrates a targeted approach to developing specialised digital skills. The UK's brief experiment with information manoeuvres is, however, one example where initiatives come and go rather than being sustained.

The national commitment to AI skills development – through His Majesty's (HM) Government's partnerships with tech giants that aims to train 7.5 million British workers in essential AI skills by 2030 – creates a broader talent pipeline.[48] However, the British Armed Forces know that they must compete for this talent, and ensure that its unique training requirements are met. The utilisation of all new tech is equally applicable here. This suggests the services should make their offer far more attractive than the standard jobs in the private sector; there should be a 'value added'.[49]

[46] See: Mann Virdee, 'Science, not "Sir Humphrey": Fixing Whitehall's "tepid bath"', Council on Geostrategy, 15/05/2025, https://www.geostrategy.org.uk/ (checked: 18/03/2026), and 'Defence Committee publishes highly critical report on UK defence procurement', UK Parliament, 17/07/2023, https://committees.parliament.uk/ (checked: 18/03/2026).
[47] See: '2020 Department of Defence Artificial Intelligence Education Strategy', United States Department of War, 09/2020, https://nwcfoundation.org/ (checked: 18/03/2026), and Christopher Smith, 'Educating the AI-Ready Warfighter: A Framework for Ethical Integration in Air Force Professional Military Education', *Wild Blue Yonder*, 17/06/2025, https://www.airuniversity.af.edu/ (checked: 18/03/2026). For the US Army approach, see: 'Army Scientists Train Soldiers on How to Leverage AI Technologies', *Soldier Systems*, 05/06/2025, https://soldiersystems.net/ (checked: 18/03/2026), and C. Anthony Pfaff and Christopher Hickey, 'Integrating Artificial Intelligence and Machine Learning Technologies into Common Operating Picture and Course of Action Development', US Army War College, 15/07/2025, https://publications.armywarcollege.edu/ (checked: 18/03/2026).
[48] 'Tech giants join government to kick off plans to boost British worker AI skills', Department for Science, Innovation, and Technology, 14/06/2025, https://www.gov.uk/ (checked: 18/03/2026).
[49] 'Artificial Intelligence sector study 2023', Department for Science, Innovation, and Technology, 23/10/2024, https://www.gov.uk/ (checked: 18/03/2026).

5.2 Data and infrastructure: The digital backbone and targeting web

Effective AI integration is fundamentally dependent on robust data management and a modernised digital infrastructure.[50] Defence seeks to shift from being platform-centric to force-centric, and ultimately to 'data-centric', recognising data as a strategic asset. This necessitates accessible and exploitable data, with continuous data collection. The aspiration is to create a single digital targeting web for multi-domain operations.[51]

However, significant challenges exist. Sensitive military data, ranging from troop movements to weaponry specifications, requires stringent protection, making data security and sovereignty paramount. Large volumes of data are essential for AI systems to learn effectively, but sharing and storing this data raises considerable concerns. Solutions include divided networks, protected cloud environments, encryption, and, increasingly, training AI models 'on the edge'; that is, directly on military equipment or secure local servers to reduce data travel and maintain sovereign jurisdiction.

Legacy technology and software within defence agencies often lack the flexibility, processing power, or data formats required for AI algorithms to function optimally. The integration process therefore demands progressive updates and meticulous planning, often involving the development of AI applications able to integrate with current systems via middleware or an Application Programming Interface (API). This gradual integration allows modernisation without disrupting ongoing operations.

Furthermore, while AI systems are designed to provide rapid insights, accuracy cannot be sacrificed for speed, as false alarms or erroneous predictions can have severe consequences. Building AI models able to process complex data quickly while maintaining high reliability requires meticulous testing and tuning. The ability to ingest real-world streaming data from social media via distributed sensors throughout the

[50] 'Digital Strategy for Defence', Ministry of Defence, 27/05/2021, https://www.gov.uk/ (checked: 18/03/2026).
[51] Robert Johnson, 'Multi-Domain Integration and Multi-Domain Operations', in Robert Johnson and Janne Haaland Matlary (eds.), *NATO and the Russian War in Ukraine* (London: Hurst Publishers, 2024), and 'The Strategic Defence Review 2025 – Making Britain safer: Secure at home, strong abroad', Ministry of Defence, 02/06/2025, https://www.gov.uk/ (checked: 18/03/2026).

globe, and process petabytes of data using the cloud and GPUs for real-time analysis, is crucial for advanced AI applications.

5.3 Agile procurement and industry collaboration

The traditional defence procurement system, often characterised by long project timelines (often five years from bid to delivery, or even longer) and a risk-averse culture, poses the most significant barrier to rapid technology adoption. The traditional procurement timeline is completely incompatible with the faster investment and financing cycles of startups and SMEs, leading to these smaller, innovative companies being put out of business before initial payments are received. Worse still, the rapidity of development in AI means there is a failure to adopt systems early, which in turn means the system is constantly waiting for an opportune moment to engage and start integration when continuous integration and development would be a far better policy.

The establishment of UKDI, with its focus on simplifying fragmented processes, introducing a single coherent pathway for turning prototypes into deployable capabilities and utilising flexible procurement mechanisms, is a direct response to these challenges. The same approach should be adopted for training and education in all forms of new technology.

The MOD should identify and address existing gaps in digital infrastructure, data management, and the AI skills base as a matter of urgency – as if Britain was at war, as the SDR implied. Encouraging closer partnerships between industry, academia, and the military, including through multinational centres of excellence (e.g., AUKUS, the Global Combat Air Programme [GCAP], and the NATO centres), is vital.

The US Defence Innovation Unit (DIU) serves as a successful model for bridging the gap between the Pentagon and Silicon Valley through rapid prototyping and a culture that incentivises taking risks.[52] Open dialogue and joint oversight, where defence end-users collaborate closely with AI developers, are essential for tuning AI tools to real-world military conditions and building trust among personnel. The UK should adopt

[52] 'Accelerating Commercial Technology for National Security', Defence Innovation Unit, No date, https://www.diu.mil/ (checked: 18/03/2026). One particular methodology which the author worked on remains classified.

these practices with greater urgency than exhibited at present as the speed of AI development continues to accelerate exponentially.[53]

5.4 Ethical considerations inhibiting deployment

The integration of AI into training and operations raises ethical questions that tend to inhibit deployment because of exaggerated fears. Anxieties about 'killer robots' and AI intrusion into privacy are old debates inspired by science fiction. In many cases, privacy was abrogated by millions of citizens when they adopted various social media platforms and software into their daily lives, and the arguments are therefore invariably contradictory. In other words, citizens have opted to place their private life online, and cannot at the same time claim violations of privacy.

The fears about AI are of the 'black box' nature of AI decision-making, where systems produce unexplainable outputs.[54] This lack of transparency could lead to poor decisions, unthinking dependency, or distrust. AI decisions need to be explainable in order to assess their quality and improve future outputs, although this assumes adequate time for evaluation, which may be scarce in high-stress situations.

Adversaries are unlikely to have such qualms. Indeed, incoming AI-enabled threats are creating a sense of urgency, which may jeopardise attempts to slow down ethical AI safeguard testing, or to ensure it is done at all.[55]

The preferences of AI systems is a challenge, which stems from societal biases embedded in training data, algorithmic design choices,

[53] See: Charlie Giattino et al., 'Artificial Intelligence', Our World in Data, No date, https://ourworldindata.org/ (checked: 18/03/2026).
[54] See: 'The AI Black Box Problem – Why We Can't Always Explain Its Choices', *Science News Today*, 31/07/2025, https://www.sciencenewstoday.org/ (checked: 18/03/2026), Lou Blouin, 'AI's mysterious "black box" problem, explained', University of Michigan-Dearborn, 06/03/2023, https://umdearborn.edu/ (checked: 18/03/26), and 'The AI Black Box Dilemma: Transparency in AI Reasoning Process Falls Short', OpenTools, 11/04/2025, https://opentools.ai/ (checked: 18/03/2026).
[55] Eric Schmidt et al., 'Final Report: National Security Commission on Artificial Intelligence', US National Security Commission on Artificial Intelligence, 2021, https://www.dwt.com/ (checked: 18/03/2026). In summary, these are: AI-enabled information operations (mapping tensions and exploiting societal divisions with AI generated propaganda); data harvesting and targeting of individuals (harvesting personal data on citizens and using AI to target them individually); accelerated cyber attacks (more precise, tailored, fast, automated, stealthy, persistent, effective, and large-scale); adversarial AI (manipulating, evading, poisoning, stealing, and biasing AI systems – an area which the UK spends no resource on at all whereas the PRC has invested US$20 billion [£15 billion]); and AI-enabled biotechnology (strategic threats to competitiveness and operational threats from breakthroughs).

and how users deploy the systems. AI tends to perpetuate these biases. Algorithmic bias can occur even with unbiased data, due to feedback loops or imperfect logical reasoning, potentially leading to either unpredictability or pattern forming.

Automation bias describes the human tendency to trust and over-rely on AI outputs unquestioningly, especially in high-pressure situations, even if the AI expresses uncertainty. This can lead to poor decisions, posing a conundrum for military AI usage, as human influence may have little effect in averting flawed AI decision-making – even with humans 'in the loop'. The defence industry is grappling with accountability; specifically, whether the developer or the user is responsible for mistakes caused by embedded bias. This has implications for military tribunals in the future.

To mitigate these risks, military AI systems should be built on very large datasets so that the maximum range can be used to smooth out biases while retaining a majority of human preferences and guidance. Rigorous testing is paramount to minimise errors and AI 'hallucinations'. Commanders and analysts should be trained to understand the benefits, risks, and limitations of these complex technologies.

The principle of meaningful human control over lethal force decisions is critical. Military education should adapt to include interdisciplinary training combining technology, ethical decision-making, and operational art. The US Army, for example, is fostering data-competent leaders capable of interpreting AI outputs without relying solely on analysts.[56]

However, it should be remembered that hostile actors are often unconstrained by ethical frameworks, and may view this as a tactical or operational advantage. The British Armed Forces will inevitably encounter AI-driven systems that do not differentiate between casualties; civilians; and active military, air, or naval personnel. War is inherently escalatory, and regulating war will be extremely difficult. Thus, the overemphasis on the peacetime military applications of AI can be seen as an inhibiting factor.[57]

[56] 'Strategy', Office of the DAF Chief Information Officer, No date, https://www.dafcio.af.mil/ (checked: 18/03/2026).
[57] Eric Schmidt et al., 'Final Report: National Security Commission on Artificial Intelligence', US National Security Commission on Artificial Intelligence, 2021, https://www.dwt.com/ (checked: 18/03/2026).

6.0 Conclusion

The integration of new technology, particularly AI, into the training and education of British Armed Forces personnel is not an option – it is a strategic imperative.

The changing character of war, driven by rapid technological advancements and proactive AI integration by adversaries, demands a transformative approach to the British Armed Forces and their preparedness. The UK has established a strategic objective in its recent defence reviews, and set up innovation bodies and digital training programmes, but significant work remains to realise the potential of AI in its force development fully.

This Policy Paper demonstrates that AI offers unparalleled opportunities to enhance training through personalised adaptive learning, dynamic and realistic scenario generation with intelligent adversaries, objective performance assessment, and accelerated decision support. These capabilities promise to create a more agile, lethal, and integrated force, capable of operating effectively across multiple domains.

However, the successful adoption of AI is contingent upon addressing certain obstacles related to workforce development, data management, infrastructure modernisation, agile procurement, and misunderstood ethical standards in AI deployment.

6.1 Policy recommendations

To improve training to incorporate new technology, especially AI, the British Armed Forces should consider the following recommendations:

1. **Accelerate AI-driven adaptive learning and simulation:**
    - Prioritise investment in AI-powered adaptive learning systems and advanced STEs that can adjust dynamically to individual trainee performance and generate realistic, unpredictable scenarios with intelligent AI adversaries.
    - This will enable 'precision training', thus accelerating skill development, boosting engagement, and preparing personnel for the chaos and uncertainty of combat more effectively and cost-efficiently than traditional

methods. Leveraging existing STE capabilities will expedite implementation.

2. **Cultivate a pervasive AI-ready digital culture:**
    - Implement comprehensive, multi-tiered workforce development programmes that foster a growth mindset and digital culture across all ranks, from recruits to senior leadership. This includes mandatory AI literacy training, specialised AI skills development, and interdisciplinary education combining new technology and operations, starting with extensive familiarity with drone technologies.
    - Launch awareness campaigns that demonstrate efficiency gains, and offer incentives and career progression credits for early adopters and successful trainees.
    - As technology adoption is fundamentally a human challenge, a cultural shift is essential to overcome resistance; incentivise risk-taking; and ensure that personnel are empowered, trusted, and trained to utilise AI effectively as a strategic partner, not just as a tool. Recreational and competitive use of drones as a military sport could encourage adoption, as Bisley Shooting Ground did for shooting.

3. **Modernise data and IT infrastructure for AI:**
    - Invest significantly in modernising legacy IT infrastructure to support AI workloads, ensuring accessible and exploitable data.
    - Develop robust data management frameworks that prioritise data security, sovereignty, and quality, exploring 'edge computing' solutions for sensitive military data.
    - Build on existing infrastructure and initiatives for speed and, where possible, select open architecture solutions while being operational security aware.
    - Establish central data repositories for unified analytics (AI systems are data-hungry).
    - A strong digital backbone with high-quality, secure, and readily available data is fundamental for training AI models, enabling real-time decision support, and ensuring the reliability and accuracy of AI applications. The solution is 'the bigger, the better'.

4. **Streamline agile procurement and foster dual-use collaboration:**
    - Empower UKDI with the necessary authority and flexible contracting mechanisms to prototype and acquire cutting-edge, dual-use AI technologies rapidly, from both established defence suppliers and innovative SMEs.
    - Integrate training requirements directly into procurement cycles, but first reform and streamline procurement itself, adopting 'wartime rules' for the adoption of new technology.
    - Co-invest in Research and Development (R&D) with defence technology companies.
    - Fund challenge prizes for faster delivery on design and implementation.
    - Second personnel to defence industries and SMEs, and reciprocate so that companies understand the imperatives.
    - The pace of commercial AI development far outstrips traditional defence procurement timelines. Agile procurement is critical to getting advanced capabilities into the hands of the frontline users and ensuring training keeps pace with technological advancements. Adversaries are already ahead of the UK, and it is therefore imperative to speed up the cycles and acquire a mass of trained personnel who are adaptable in mind.

5. **Establish clear ethical AI frameworks and human-AI teaming doctrines:**
    - Develop and implement clear ethical guidelines for AI use in training and operations, addressing concerns with clear guidance and warnings about human dependencies. This could be done by rehearsing reversionary modes twice a year.
    - Mandate continuous testing and evaluation of AI systems for fairness and reliability, and prioritise training that emphasises critical interpretation of AI outputs.
    - Responsible AI development and deployment are paramount to maintaining trust, mitigating risks (including unintended consequences and civilian harm), and ensuring that AI augments human judgement and accountability in military contexts rather than undermining it. However, the British Armed Forces should remember that adversaries' AIs will not be so discriminating. It is vital to be aware of the force protection that will be required in war settings.

About the author

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