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From Bullets to Bytes - Rethinking Military Readiness in an AI Era (?)

Andy Fawkes | Joint Military Training & Simulation Conference | Bristol | 5/6 March 2025

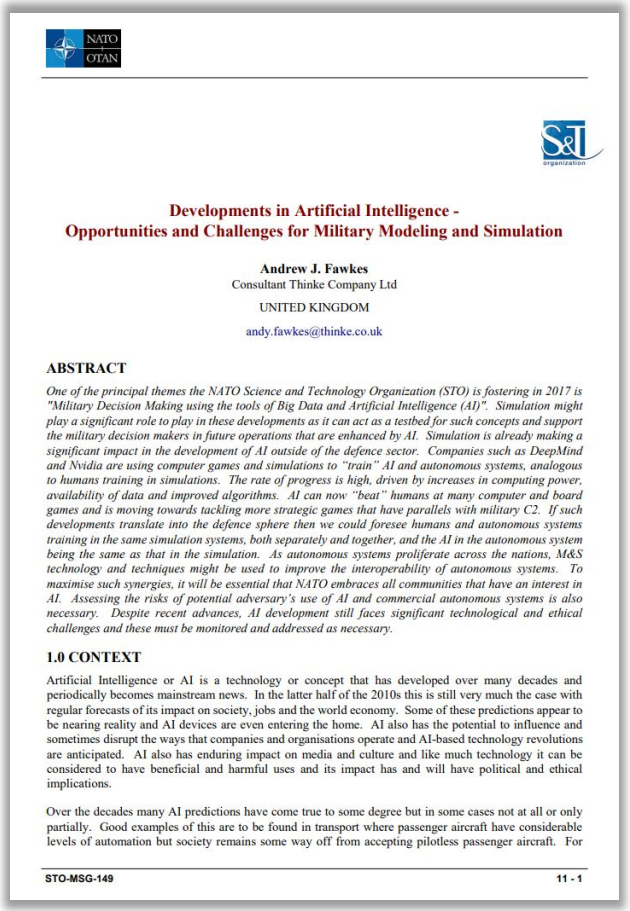
THINKE

- Readiness
- Ready for What?
- What about AI
- Digital Human Twin
- Data

- Andy Fawkes, Consultant, writer and speaker on developments in simulation and training • Ready for what? - The changing nature of warfare and readiness • Delivering readiness - AI-enhanced training and simulation • Assessing and shaping readiness - AI in support of the evaluation and management of readiness • Actionable insights - Readiness opportunities and challenges

- Key Strategic Points for Senior Managers Considering AI in Workforce Learning
- 1. AI as an Enabler, Not a ReplacementAI should be seen as a tool to support instructors and learners rather than replace human expertise.The focus should be on enhancing decision-making, improving training efficiency, and enabling real-time feedback.AI-driven personalisation can tailor training to individual needs, aligning learning outcomes with industry standards.
- 2. Data is Critical to AI SuccessThe effectiveness of AI in training is heavily dependent on high-quality, well-structured data.Many organisations still struggle with fragmented, unstructured, and siloed data, making AI implementation challenging.Investing in data governance, structuring, and accessibility should be a priority before rolling out AI-based solutions.There is potential for shared industry data lakes to improve training and analytics across organisations.
- 3. AI Adoption Requires Change ManagementOrganisations need to invest in AI awareness and training for instructors and management teams.Resistance to AI is common, especially among experienced instructors accustomed to traditional training methods.A structured, step-by-step adoption approach, starting with small-scale pilot projects, is recommended to build confidence and demonstrate value.
- 4. Balancing AI Benefits with Trust and RegulationAI adoption must align with aviation and defence regulatory standards (e.g., FAA, EASA).There are growing efforts to create governance frameworks to ensure AI solutions are explainable, unbiased, and meet safety-critical requirements.Certification and validation of AI tools remain areas for further industry development.5. The Role of AI in Personalised LearningAI can enable competency-based and evidence-based training (e.g., adaptive learning paths, scenario-based simulations).Next-generation AI tools, including machine learning and generative AI, can automate parts of the training design and evaluation process.AI-driven tools should be tested within existing structures to ensure they meet training and operational needs without causing unintended risks.6. Addressing AI Misuse and Unregulated AdoptionAI is already being used informally by learners (e.g., ChatGPT for pilot training), which may result in inconsistent or unreliable information.Organisations should proactively provide AI-driven training resources that are validated and controlled to prevent misinformation.AI adoption should be carefully monitored to maintain compliance with industry regulations and avoid security risks.
- 7. Industry Collaboration and Knowledge SharingThe aviation and defence industries need to foster collaboration in AI research, data sharing, and best practices.Open data standards and common frameworks could enable more effective AI applications across training ecosystems.Learning from other industries (e.g., healthcare, cybersecurity) may provide insights into best practices for AI adoption in high-risk environments.8. AI’s Role in Operational Efficiency and Cost ReductionAI can contribute to cost savings through reduced training time, optimised simulator usage, and streamlined recruitment processes.Predictive analytics can enhance skills assessments, reduce failure rates, and improve training outcomes.Automation of routine tasks (e.g., training program design, compliance monitoring) allows instructors to focus on higher-value activities.
- 9. Future Considerations for AI in Workforce TrainingAI is evolving rapidly, and organisations need to stay informed about new developments.Regulatory frameworks for AI governance in training are still emerging and need industry-wide input.Future AI advancements, such as AI-driven agents and improved language models, may further refine learning processes.ConclusionSenior managers should approach AI adoption strategically, prioritising:Structured data managementIncremental AI implementationWorkforce upskilling in AIAdherence to regulatory and ethical standardsCollaboration with industry stakeholdersWith AI becoming integral to workforce training, organisations must take proactive steps to integrate AI effectively rather than passively observe developments. Doing nothing is not an option.

A Little Background



NATO OTAN

S&T organization

Developments in Artificial Intelligence - Opportunities and Challenges for Military Modeling and Simulation

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ABSTRACT

One of the principal themes the NATO Science and Technology Organization (STO) is fostering in 2017 is "Military Decision Making using the tools of Big Data and Artificial Intelligence (AI)". Simulation might play a significant role to play in these developments as it can act as a testbed for such concepts and support the military decision makers in future operations that are enhanced by AI. Simulation is already making a significant impact in the development of AI outside of the defence sector. Companies such as DeepMind and Nvidia are using computer games and simulations to "train" AI and autonomous systems, analogous to humans training in simulations. The rate of progress is high, driven by increases in computing power, availability of data and improved algorithms. AI can now "beat" humans at many computer and board games and is moving towards tackling more strategic games that have parallels with military C2. If such developments translate into the defence sphere then we could foresee humans and autonomous systems training in the same simulation systems, both separately and together, and the AI in the autonomous system being the same as that in the simulation. As autonomous systems proliferate across the nations, M&S technology and techniques might be used to improve the interoperability of autonomous systems. To maximise such synergies, it will be essential that NATO embraces all communities that have an interest in AI. Assessing the risks of potential adversary's use of AI and commercial autonomous systems is also necessary. Despite recent advances, AI development still faces significant technological and ethical challenges and these must be monitored and addressed as necessary.

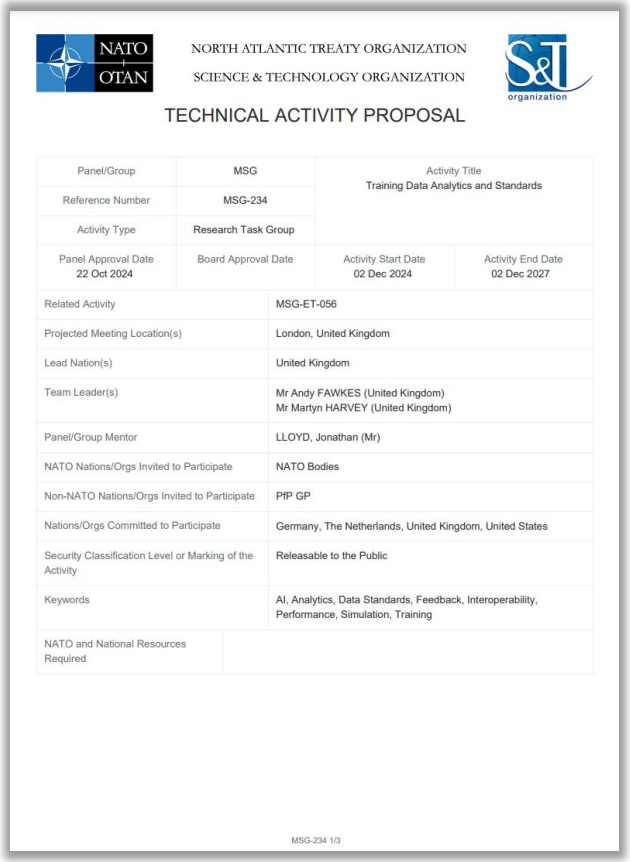
1.0 CONTEXT

Artificial Intelligence or AI is a technology or concept that has developed over many decades and periodically becomes mainstream news. In the latter half of the 2010s this is still very much the case with regular forecasts of its impact on society, jobs and the world economy. Some of these predictions appear to be nearing reality and AI devices are even entering the home. AI also has the potential to influence and sometimes disrupt the ways that companies and organisations operate and AI-based technology revolutions are anticipated. AI also has enduring impact on media and culture and like much technology it can be considered to have beneficial and harmful uses and its impact has and will have political and ethical implications.

Over the decades many AI predictions have come true to some degree but in some cases not at all or only partially. Good examples of this are to be found in transport where passenger aircraft have considerable levels of automation but society remains some way off from accepting pilotless passenger aircraft. For

2017

2018



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NORTH ATLANTIC TREATY ORGANIZATION
SCIENCE & TECHNOLOGY ORGANIZATION

S&T organization

TECHNICAL ACTIVITY PROPOSAL

Panel/Group	MSG	Activity Title: Training Data Analytics and Standards	
Reference Number	MSG-234		
Activity Type	Research Task Group		
Panel Approval Date: 22 Oct 2024	Board Approval Date	Activity Start Date: 02 Dec 2024	Activity End Date: 02 Dec 2027

Related Activity	MSG-ET-056
Projected Meeting Location(s)	London, United Kingdom
Lead Nation(s)	United Kingdom
Team Leader(s)	Mr Andy FAWKES (United Kingdom) Mr Martyn HARVEY (United Kingdom)
Panel/Group Mentor	LLOYD, Jonathan (Mr)
NATO Nations/Orgs Invited to Participate	NATO Bodies
Non-NATO Nations/Orgs Invited to Participate	PfP GP
Nations/Orgs Committed to Participate	Germany, The Netherlands, United Kingdom, United States
Security Classification Level or Marking of the Activity	Releasable to the Public
Keywords	AI, Analytics, Data Standards, Feedback, Interoperability, Performance, Simulation, Training
NATO and National Resources Required	

2025
Training Data Analytics & Standards

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Recent Work

- Home Office
  - XR Headset Data Framework
  - Learning from Computer Games
- Dstl
  - Gaming Ecosystem Study
  - Military Metaverse study
  - Military Metaverse Sandpit
  - Simulation Enterprise Analysis Study
  - Novel Simulation
  - XR Standards and Security
  - Data and Evaluation
  - Learning Futures

A Bit of Bullet History

- Ancient – Lead Sling Bullets: Ranged attacks, effective for skirmishers
- 15th–19th Century – Round Lead Ball: Smoothbore muskets, close-range volley fire, massed formations.
- 1849 – Minié Ball: Rifled muskets, increased range, accuracy, and the need to use cover
- 1880s – Full-Metal Jacket (FMJ) Bullet: Improved penetration, sustained fire in rifles and machine guns
- 1898 – Spitzer Bullet: Pointed design, longer range, more accurate marksmanship
- Early 20th Century: Sustained accurate firepower → trench warfare

Incremental improvements over very long periods of time; often military personnel inventions; some breakthroughs (Minié, Spitzer) significantly reshaped warfare tactics

What is Readiness?

Readiness as a Priority

UNITED STATES SENATE COMMITTEE ON THE BUDGET

ABOUT | CHAIRMAN | RANKING MEMBER | HEARINGS | CONTACT

Chairman / Chairman's Newsroom / Chairman Press

02.07.25

Chairman Graham Unveils FY 2025 Budget Resolution To Secure The Border, Revitalize Our Military, Unleash American Energy Production And Begin The Process Of Restoring Fiscal Sanity

WASHINGTON – U.S. Senator Lindsey Graham (R-South Carolina), Chairman of the Senate Budget Committee, today released the text of the Senate's Fiscal Year 2025 Budget Resolution.

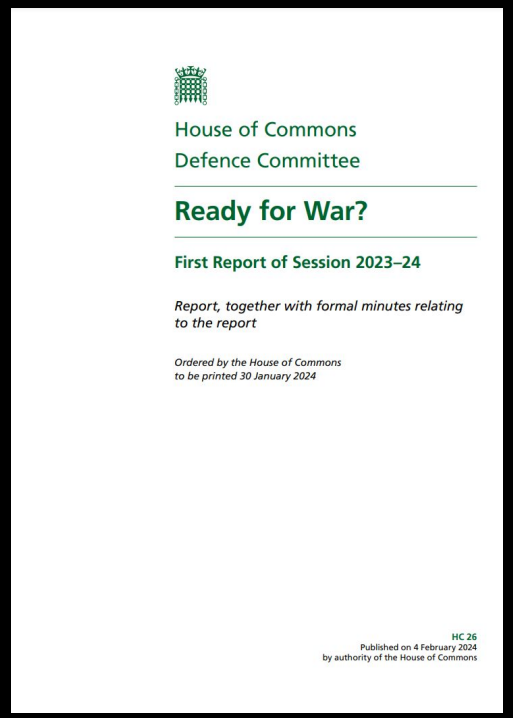
The FY 2025 budget resolution will be the blueprint that unlocks the pathway for a fully paid for reconciliation bill to secure the border, bolster our military, increase American energy independence and begin the process of fiscal sanity.

*"To those who voted for and support real border security and a stronger defense in a troubled world, help is on the way," **said Senator Graham.** "This budget resolution jumpstarts a process that will give President Trump's team the money they need to secure the border and deport criminals, and make America strong and more energy independent."*

- **Revitalizes our military** by providing critical funding for the Department of Defense to strengthen the U.S. military to deter conflict and ensure our nation's security. Priorities to plus up our national defense include:
  - Maintaining U.S. military readiness and the ability to defend U.S. interests globally.
  - Growing the U.S. Navy and strengthening its industrial base to restore U.S. maritime dominance.
  - Building an integrated air and missile defense to counter threats to the U.S. homeland.
  - Continuing to overhaul and strengthen America's nuclear defense posture.

◦ Maintaining U.S. military readiness and the ability to defend U.S. interests globally.

UK Military Readiness



House of Commons
Defence Committee

Ready for War?

First Report of Session 2023–24

Report, together with formal minutes relating to the report

Ordered by the House of Commons to be printed 30 January 2024

HC 26
Published on 4 February 2024
by authority of the House of Commons

Readiness is defined as being the period measured from an initial order to the moment when the headquarters or unit is ready to perform its task from its peacetime location (permanent or forward deployed) or ready for deployment.

Readiness posture comprises a combination of:

- **Capacity** (how much of the force is usable within a certain time frame, which is in itself underpinned by equipment availability);
- **Capability** (the effect achieved by the combination of equipment and the personnel trained and available to utilise it);
- **Interoperability** (an ability to work with other parts of the force which increases effect and can act as a potential mitigation for capability gaps);
- **Sustainability** (provision of sufficient materiel to ensure the deployed force is fully prepared to operate).

Effective military training directly translates to enhanced readiness by ensuring personnel are skilled, proficient, and prepared to execute their duties swiftly and effectively in any operational environment

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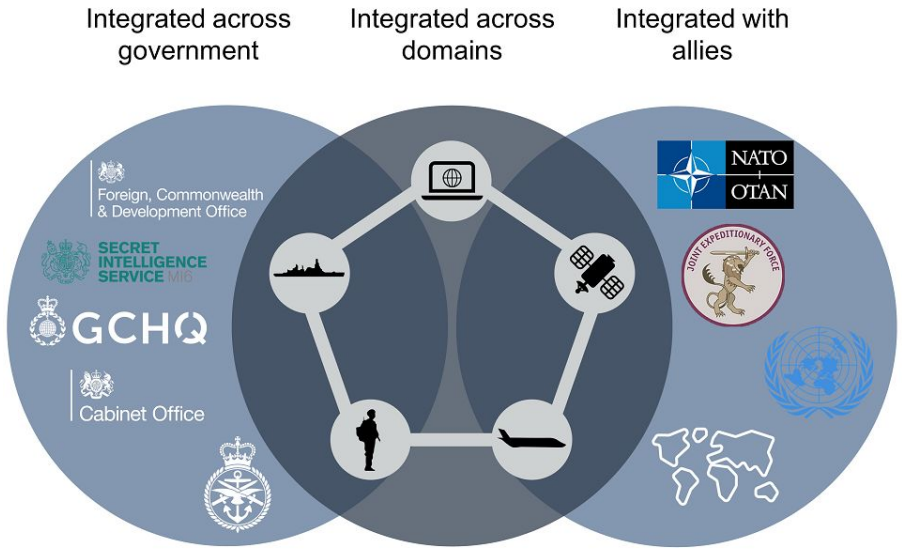
UK Royal Navy Training

- “are we ready to fight tonight?”
- “are we prepared to fight tomorrow?”

The Multi-Domain Requirement

There is a need to bring teams and teams of teams together to experiment, train and collaborate in complex multi-domain (and Joint) battlespace operations …

the first time should not be in the face of an enemy



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Ready for What?

Ready for This?

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Ready for Drones?

Forbes

Subscribe: Less than $1.50/wk

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BUSINESS > AEROSPACE & DEFENSE

New RUSI Report: Drones Now Inflicting Two Thirds Of Russian Losses

By David Hambling, Senior Contributor. I'm a South London-based technology...

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Feb 18, 2025, 08:31am EST

Save Article Comment 1

FPVs supplied by volunteers to the units of the Ukrainian Armed Forces on January 22, 2024 in Lviv, ... [+] GLOBAL IMAGES UKRAINE VIA GETTY IMAGES

RUSI

Tactical Developments During the Third Year of the Russo-Ukrainian War

Jack Watling and Nick Reynolds

Royal United Services Institute

BLOGS POLITICS MILITARY THE NATIONAL INTEREST TECHNOLOGY PODCASTS REGIONS

Topic: Security Region: Europe Tags: Drones, Technology, Ukraine, Ukraine War, and Volodymyr Zelensky

Ukraine's Fate Could Depend On Its New "Drone Line"

February 19, 2025 | By: Maya Carlin

Forbes

One Of Ukraine's Drone Boats Just Shot Down A Russian Helicopter

'Historic strike,' the intelligence directorate in Kyiv boasted.

By David Axe, Forbes Staff. David Axe writes about ships, planes, tanks, drones a...

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Published Dec 31, 2024, 11:46am EST

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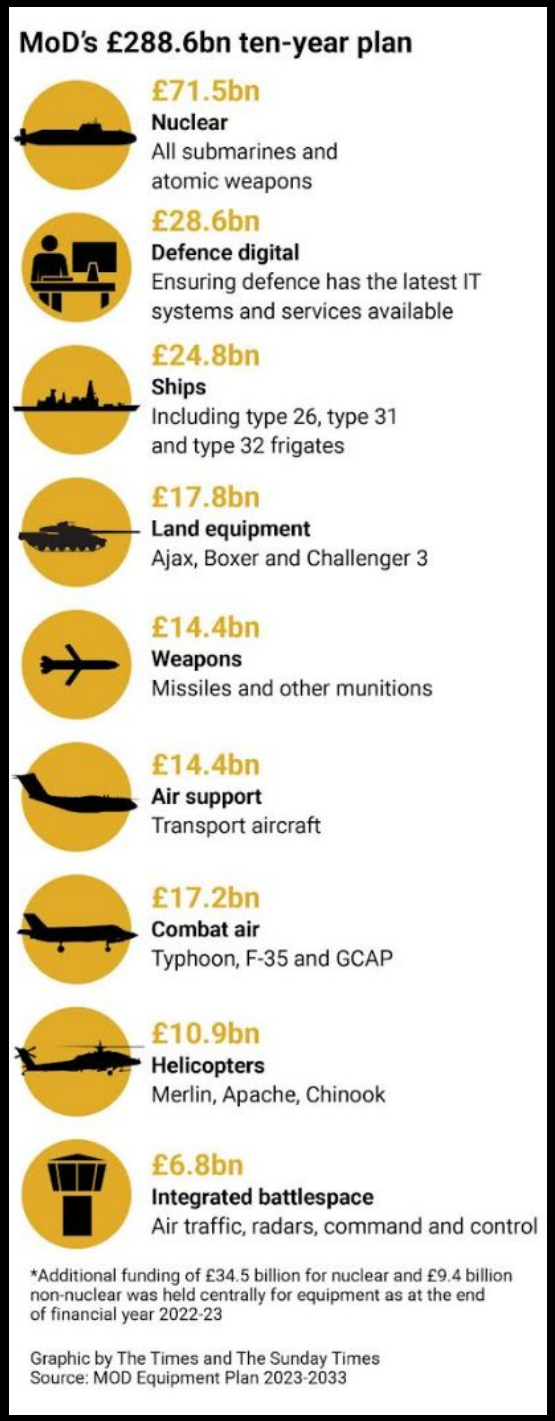
Is More Kit the Answer?



THE i PAPER

IMPARTIAL NEWS + INTELLIGENT DEBATE

Faulty warships and useless drones: How UK defence spending goes wrong

Keir Starmer has committed the Government to spending an extra £6bn a year on defence. The UK's previous procurement record suggests much of it will go to waste

Problems with Nimrod aircraft, Watchkeeper drones and Ajax armoured vehicles demonstrate how difficult spending a defence budget efficiently can be

Luke McGee

February 27, 2025 10:00 am (Updated 1:55 pm)

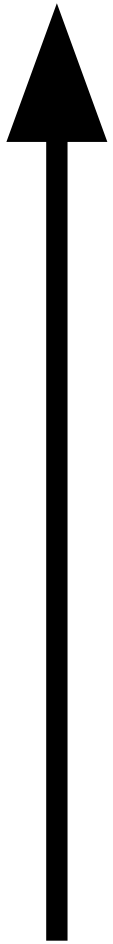
Room to Manoeuvre?

Buy Off the Shelf and Consumer Technology Based?

Viacheslav Ratynskyi/Reuters

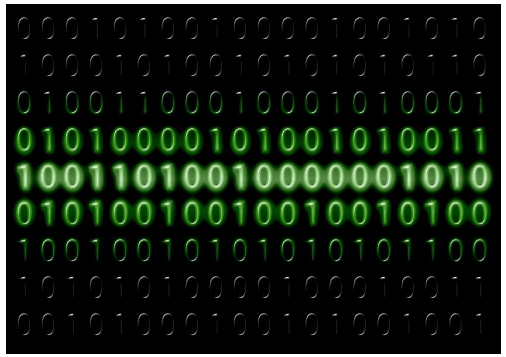
THINK

Adaptability



People

Digital



Metal

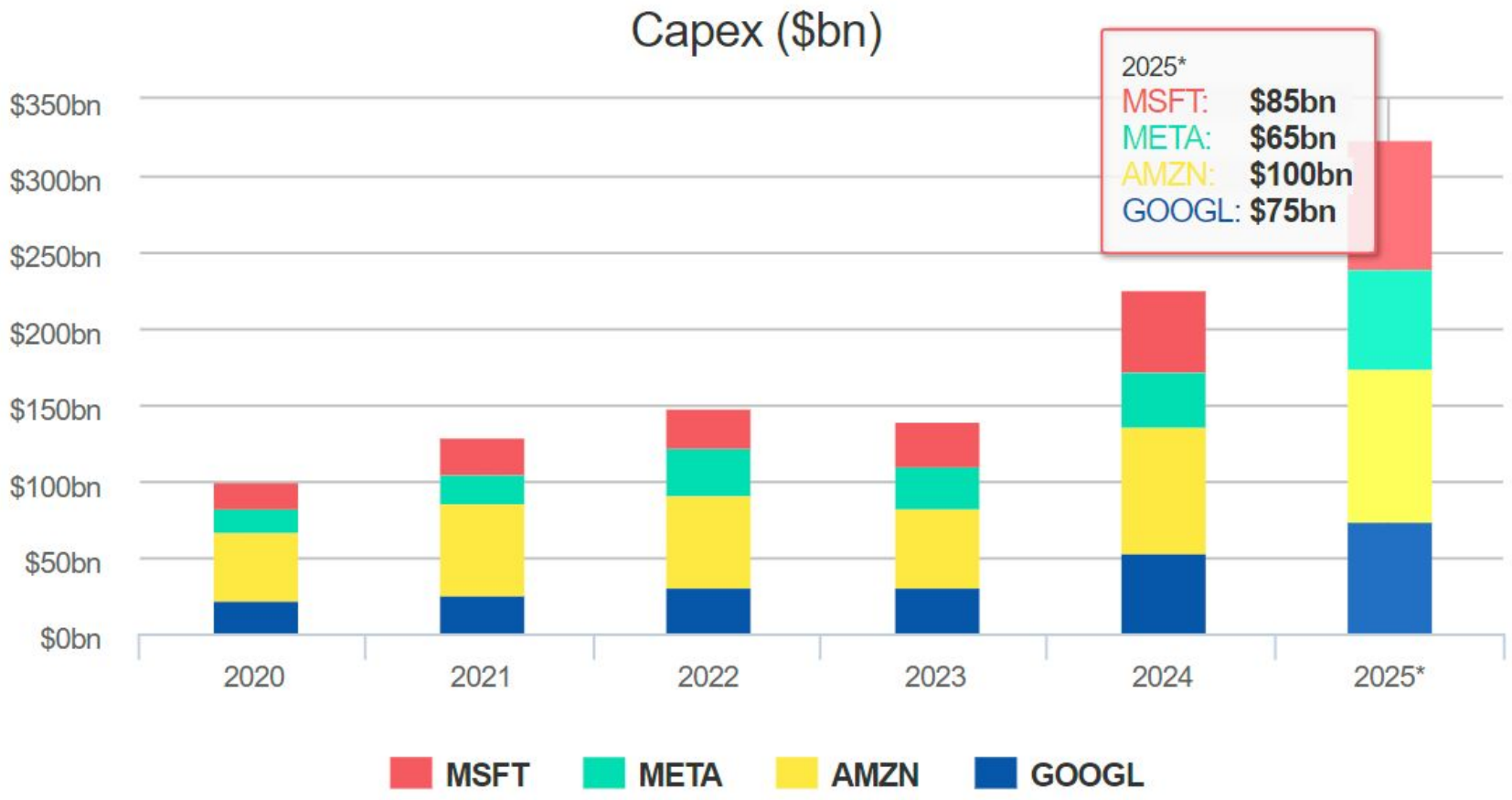
About AI

Keeping up with AI

Does Anyone Really Know?

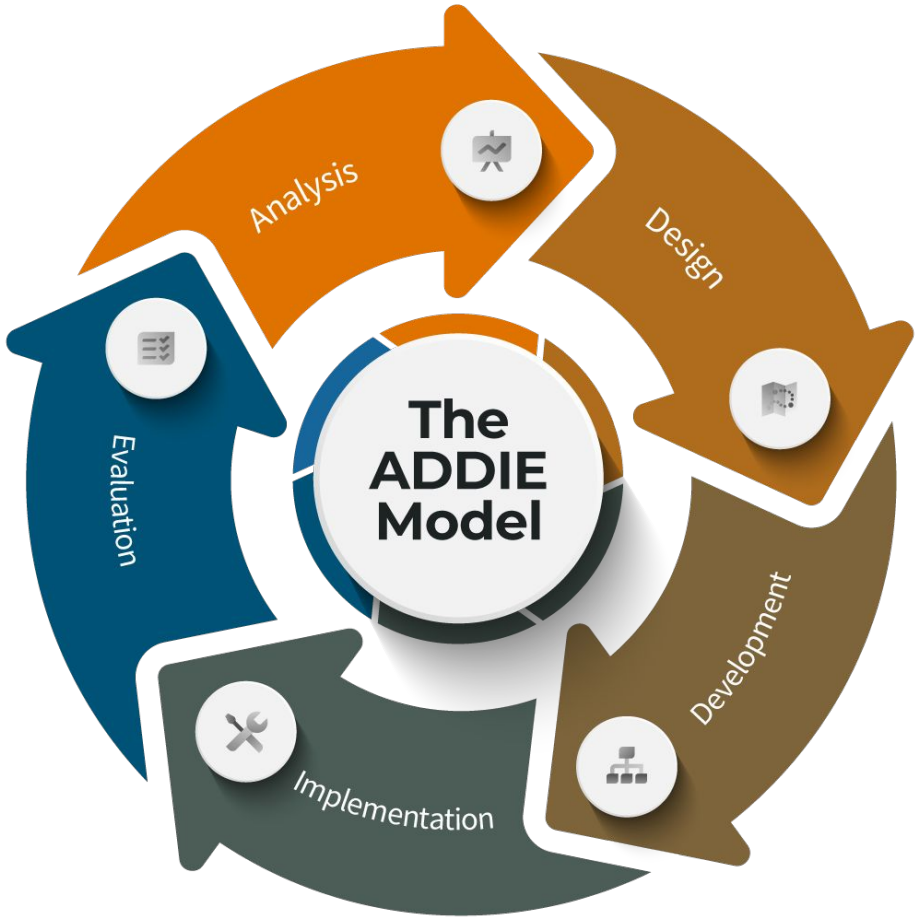
- DeepSeek – 27 January 2025
- Nvidia share price dropped by roughly 17%, wiping almost $600bn off its market value.

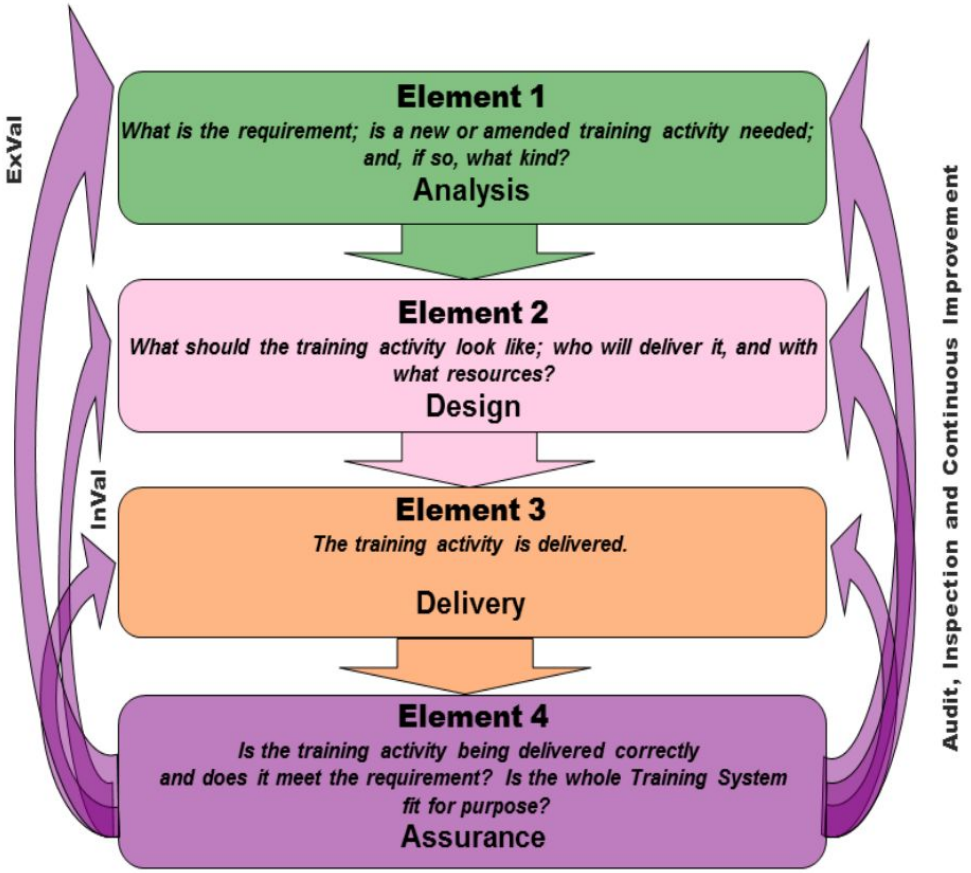
The Money Keeps Flowing



AI and Training

ADDIE & DSAT





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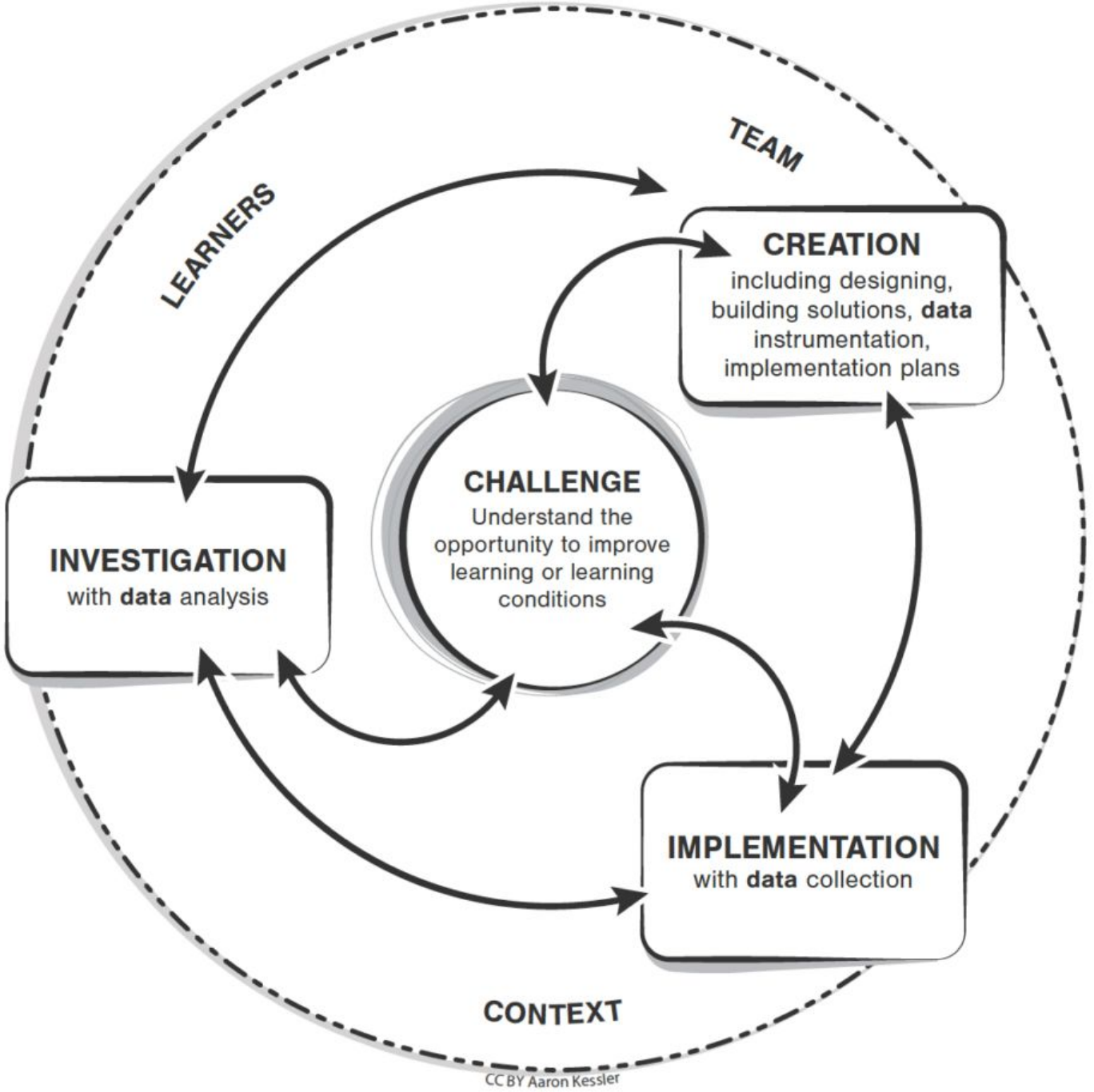
Learning Engineering

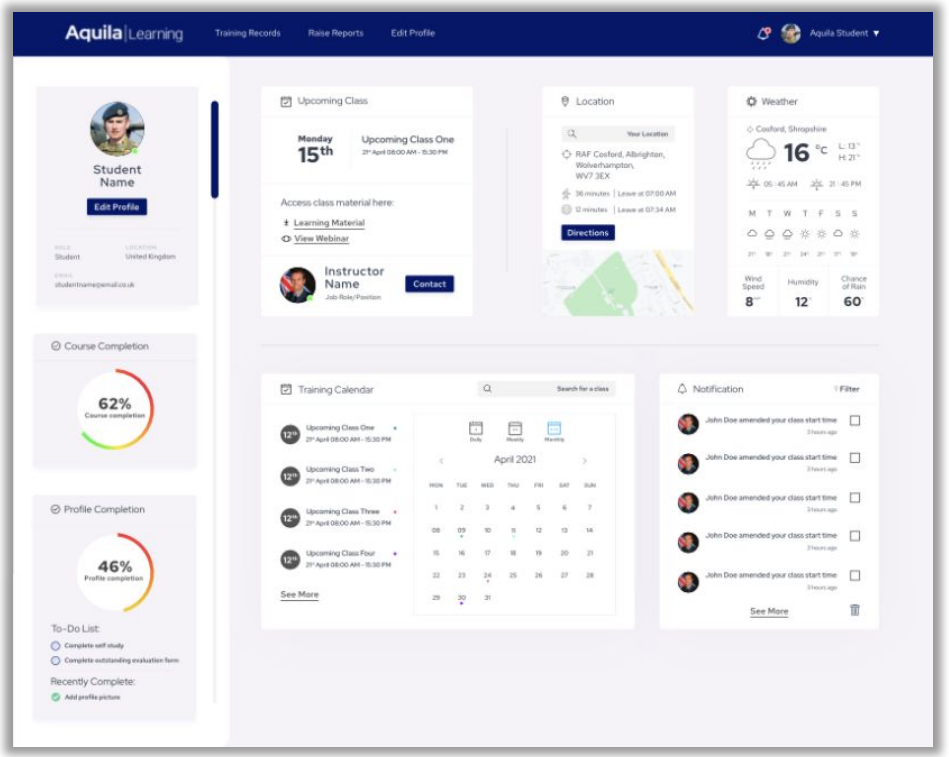
Learning Engineering is the systematic application of evidence-based principles and methods from educational technology and the learning sciences to create engaging and effective learning experiences



THINK

Learning and Resource Management Software

Aquila Learning ALaRMS™



Analysis

Make easy work of complex training needs analysis.

Explore

Design

Say goodbye to mountains of paperwork and man hours. ALaRMS™ allows you to design and develop training that always meets your operational requirements.

Explore

Delivery

Schedule, manage and deliver complex training with the ALaRMS™ Delivery Tools.

Explore

Assurance

Manage quality of training and risk through detailed evaluation, audit and assurance.

Explore

THINKE

Data & Analytics

VRAI
HEAT

Cervus
Hive

THINKe

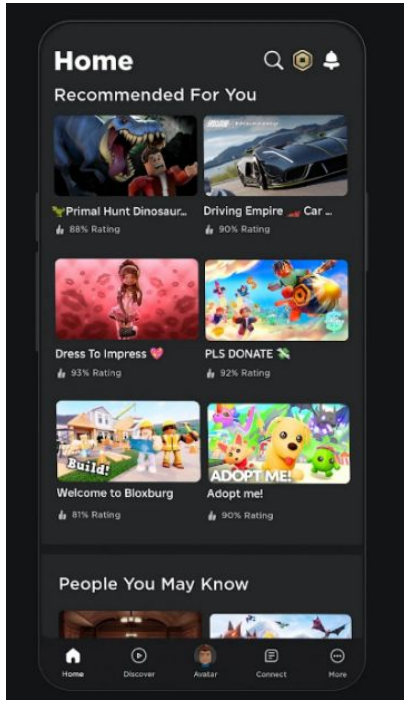
- AI Tutor
- Personalised Learning
- Adaptive Learning

OpenAI Sora

Text to Video & 3D Worlds

Virtual Worlds

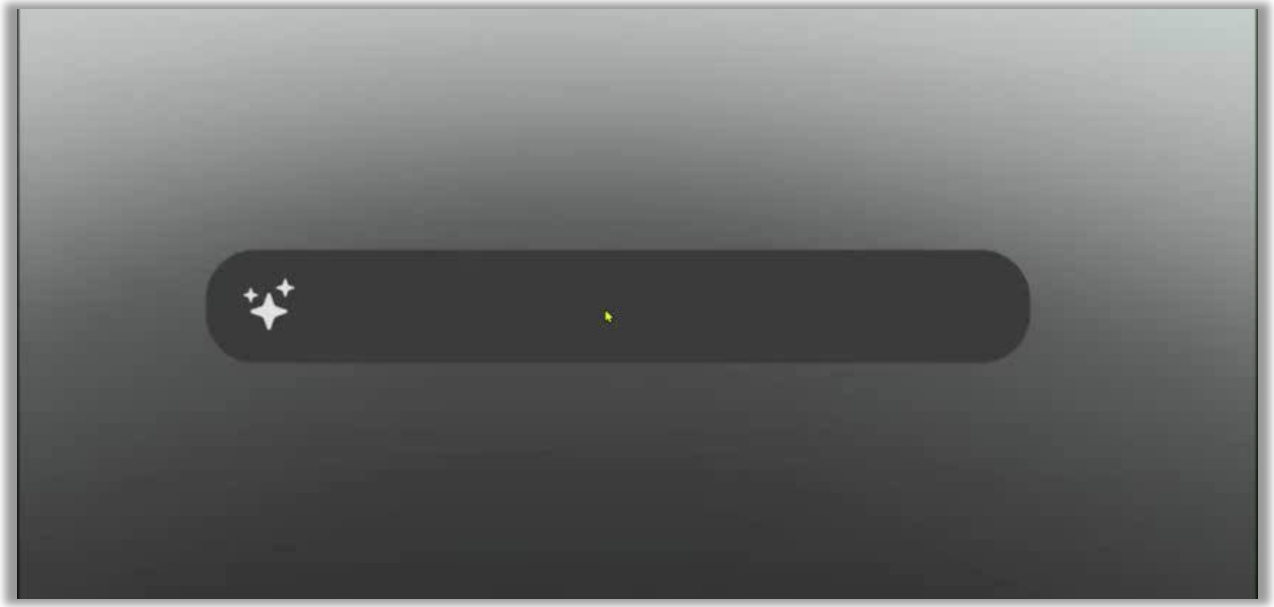
Roblox



ROBLOX

- Some Key Points (Sep 24)
  - User Growth: 79.5M daily users
  - Future Ambition: Aiming for 1bn daily users;
  - New creator earning methods include physical merchandise

Announced 6 Sept – Open source generative AI tool in development “the 3D Foundational Model”



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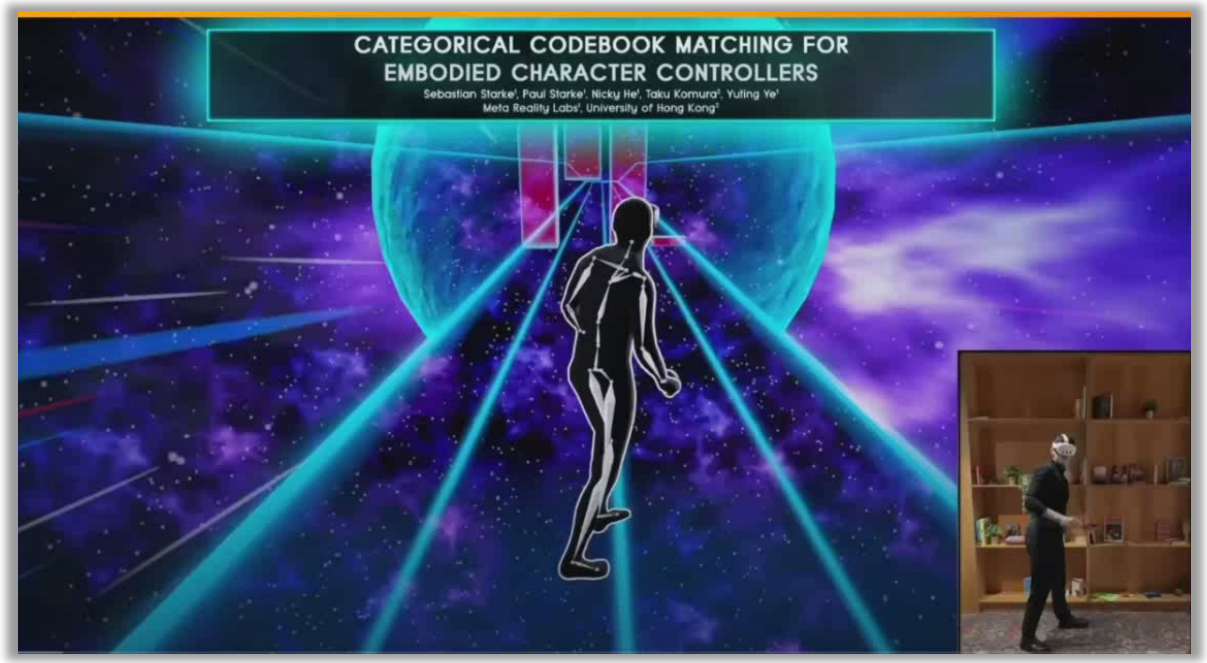
AI

Unity 6

“Sentis” AI

(9 Oct 24)

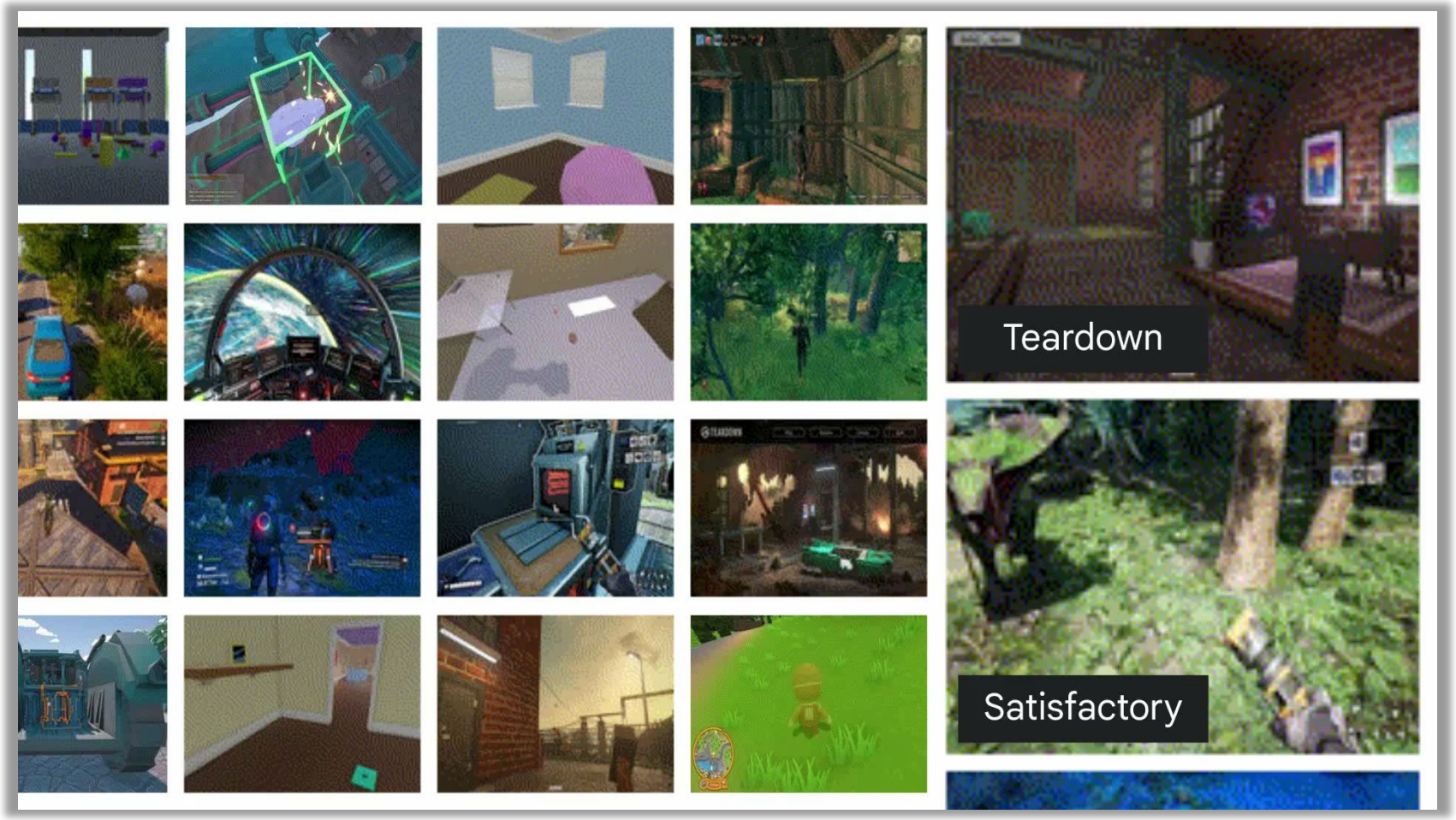


https://youtu.be/T-sbHvDF6Bw?si=6BBJmWnWPJRXtM-U

AI

Learning from video games

Google DeepMind SIMA (2024)
(Scalable Instructable Multiworld Agent)



https://deepmind.google/discover/blog/sima-generalist-ai-agent-for-3d-virtual-environments

AI

From GPUs to AI

https://youtu.be/XBrAomadM4c?si=jo03hXH-_Qx0n0d2

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Key Strategic Points for AI in Workforce Learning

1. **AI as a Training Enhancer** – AI should support instructors and learners by improving decision-making, personalising training, and providing real-time feedback, rather than replacing human expertise.

2. **Data Quality and Management is Critical** – Effective AI training relies on well-structured, high-quality data. Organisations must invest in data governance and explore shared industry data pools for better AI-driven insights.

3. **Adoption Requires Change Management and Trust** – AI integration needs structured implementation, starting with small-scale pilots. Training instructors and management teams is essential to build confidence and drive acceptance.

4. **Regulation, Ethics, and Compliance Must Be Addressed** – AI tools must align with aviation and defence regulations (e.g., FAA, EASA). Governance frameworks are evolving to ensure AI solutions remain safe, unbiased, and explainable.

5. **Doing Nothing is Not an Option** – AI is already being informally adopted by learners, and competitors are integrating AI to gain efficiencies. Failing to engage with AI risks falling behind in training effectiveness, operational performance, and regulatory readiness. Organisations must take proactive steps to ensure AI is implemented in a controlled, secure, and beneficial manner.

Warfighter Data Here, There, Everywhere

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“(Personal) Data is hard to access, technology is ageing, and processes and culture are not suited to the information age.

A fractured ecosystem has created the need for manual workarounds and interventions across the force

…

With many systems in play that either speak different data languages or are unable to communicate at all, there is no single view of data across the Armed Forces.”

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Uniting Human Data
-
Warfighter Digital Twin

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What is Meant by a Warfighter Digital Twin?

The digital twin replicates and records through career the warfighter's physical, physiological, and behavioural characteristics, with synchronous and asynchronous data interchange between the human and the digital twin

NATO STO-MP-HFM-MSG-375

Human Digital Twin in the Military

December 2024

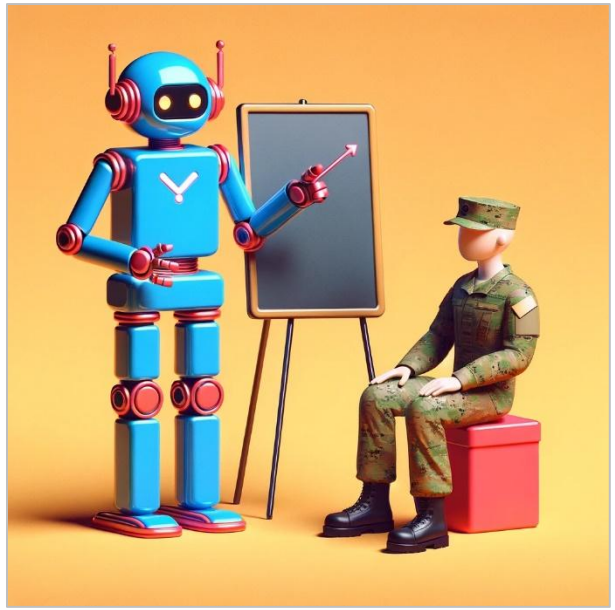
Type	Name	Title	Published	Access
	$$MP-HFM-MSG-375-Programme	Programme	12/4/2024	Open Access
	$MP-HFM-MSG-375-KN4	From the Human Digital Twin (HDT) to the Branching of the Augmented Soldier Robotic Twin (ASRT)	12/3/2024	Open Access
	MP-HFM-MSG-375-01	Human Digital Twin Research at USARIEM: Past, Present, Future	12/3/2024	Open Access
	MP-HFM-MSG-375-02	The Impact of Digital Twins in Military Intelligence: Perspectives and Opportunities	12/3/2024	Open Access
	MP-HFM-MSG-375-06	Santos GruntSim, a Soldier Load Configuration and Task Execution Assessment Tool using Human Predictive Dynamics	12/3/2024	Open Access
	MP-HFM-MSG-375-07	Technologies for Developing Warfighter Digital Twins with Biomechanics and Physiology	12/3/2024	Open Access
	MP-HFM-MSG-375-09	Human Digital Twin Applications in Special Operations Forces	12/3/2024	Open Access
	MP-HFM-MSG-375-12	Santos as an Integrated Human Digital Twin, a Case Study: US Army Combat Fitness Test	12/3/2024	Open Access
	MP-HFM-MSG-375-13	An AI Framework for Real-Time Flight Performance Forecasting and Assessment	12/3/2024	Open Access
	MP-HFM-MSG-375-15	SUPER: Augmenting human-machine teaming in defence with biofeedback-enhanced brain-computer interfaces - preliminary results	12/3/2024	Open Access
	MP-HFM-MSG-375-16	Implementing Computational Theory of Mind into Machines for Enhanced, Empathetic Human Support	12/3/2024	Open Access
	MP-HFM-MSG-375-17	Warfighter Digital Twin – Helicopter Troop Seat Digital Engineering Process from Conceptual Design to Certification by Analysis Using Human Body Models	12/3/2024	Open Access
	MP-HFM-MSG-375-18	Foundational Research Gaps and Future Directions for Digital Twins	12/3/2024	Open Access
	MP-HFM-MSG-375-19	Digital Humans for the Evaluation of Medical Devices: from Stochastic Humans to in Silico Trials and Digital Twins	12/3/2024	Open Access
	MP-HFM-MSG-375-21	The Digital Twin in Tertiary and Reconstructive Health	12/3/2024	Open Access

Human Digital Twins (HDTs) show promise in various fields, including military, medicine, and manufacturing, by enabling personalised simulations, predictions, and decision-making through integration of data, models, and feedback mechanisms.

Some Use Cases

#1

Career Planning and Recording and Health Monitoring

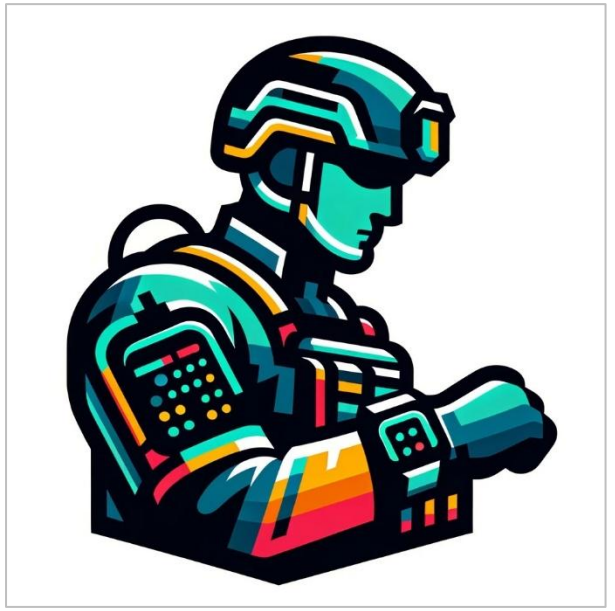


Education and Training

Some Use Cases

#2

Human Factors Studies and Equipment Acquisition Optimisation



Operational Planning, Warfighter Monitoring and Operating Autonomous Systems

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Warfighter Data Here, There, Everywhere

- Despite challenges, ignoring warfighter data is not a sustainable option
- Human data is becoming increasingly important for all aspects of defence, from recruitment through to operational effectiveness
- Embracing the challenges of human data management is essential for

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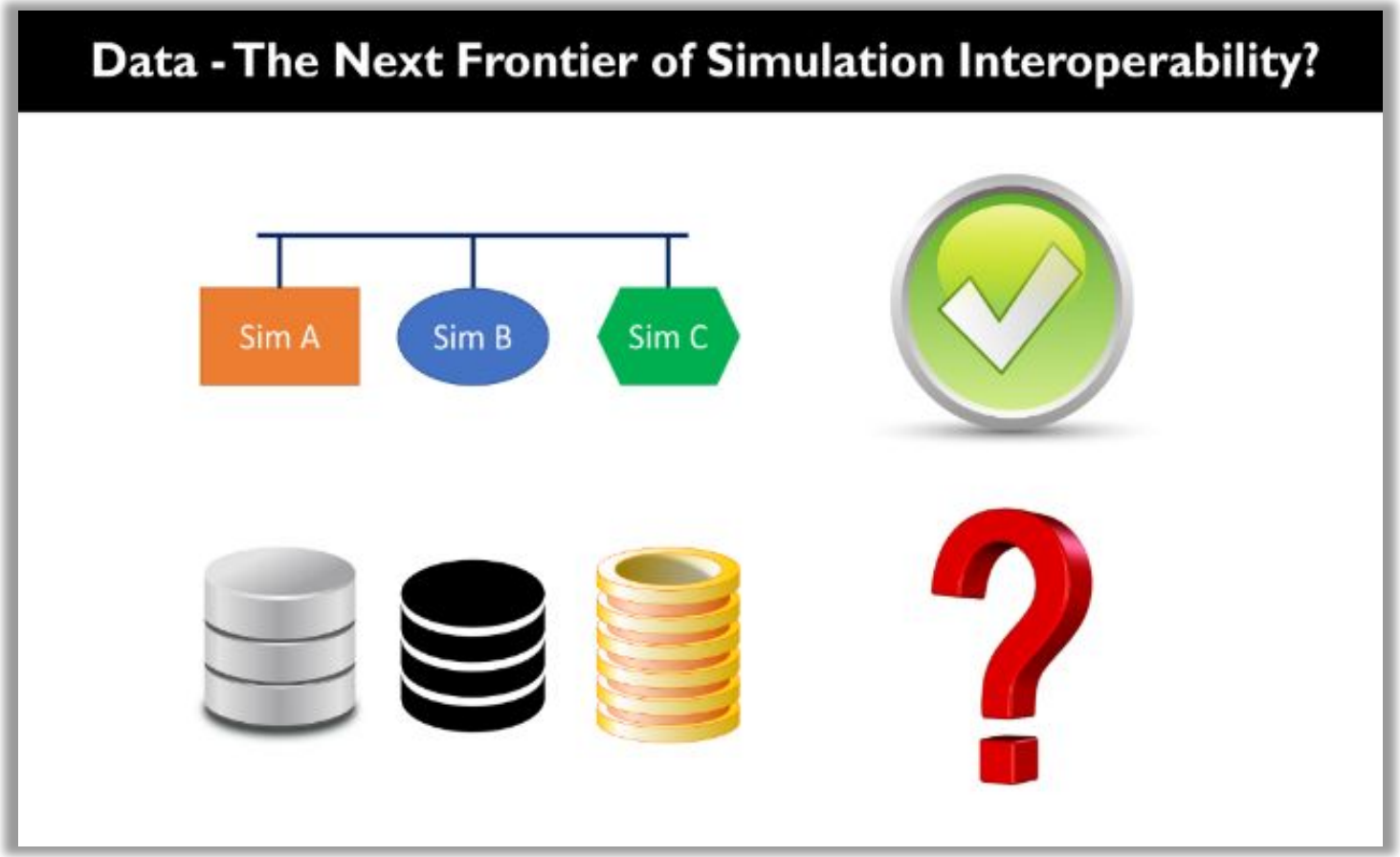
Training System Data



MSG-234 – Training Data Analytics and Standards

NORTH ATLANTIC TREATY ORGANIZATION

SCIENCE & TECHNOLOGY ORGANIZATION

TECHNICAL ACTIVITY PROPOSAL

Panel/Group	MSG	Activity Title Training Data Analytics and Standards	
Reference Number	MSG-234		
Activity Type	Research Task Group		
Panel Approval Date 22 Oct 2024	Board Approval Date	Activity Start Date 02 Dec 2024	Activity End Date 02 Dec 2027

Related Activity	MSG-ET-056
Projected Meeting Location(s)	London, United Kingdom
Lead Nation(s)	United Kingdom
Team Leader(s)	Mr Andy FAWKES (United Kingdom) Mr Martyn HARVEY (United Kingdom)
Panel/Group Mentor	LLOYD, Jonathan (Mr)
NATO Nations/Orgs Invited to Participate	NATO Bodies
Non-NATO Nations/Orgs Invited to Participate	PfP GP
Nations/Orgs Committed to Participate	Germany, The Netherlands, United Kingdom, United States
Security Classification Level or Marking of the Activity	Releasable to the Public
Keywords	AI, Analytics, Data Standards, Feedback, Interoperability, Performance, Simulation, Training

2 Year Research Task Group

Key Outcomes:

- Build the Case for and Recommend Standard(s) e.g. Existing Standard, API, Plugin
- Build Community of Interest in training data analytics & standards
- Conduct demonstration(s) to show value

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Questions?

Andy Fawkes
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| Joint Military Training & Simulation Conference | Bristol |
5/6 March 2025

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Briefing/discussion on MSG-234 – Desired Outcomes

- 2 Year RTG
- Key Outcomes:
  - Build the Case for and Recommend Standard(s) e.g. Existing Standard, API, Plugin
  - Build Community of Interest in training data analytics & standards
  - Conduct demonstration(s) to show value

- Senior managers should approach AI adoption strategically, prioritising:
- Structured data management
- Incremental AI implementation
- Workforce upskilling in AI
- Adherence to regulatory and ethical standards
- Collaboration with industry stakeholders
- With AI becoming integral to workforce training, organisations must take proactive steps to integrate AI effectively rather than passively observe developments. Doing nothing is not an option.

Halldale AI webinar

Addressing AI for workforce training across civil aviation, the military, and wider safety critical industries

Opening Address

Welcome to this Halldale panel discussion Addressing AI for workforce training across civil aviation, the military, and wider safety critical industries.

This is part of our ongoing series exploring the fast-moving world of AI and its role in learning for high-risk organizations.

Let me first start AI is being widely discussed as a transformative force in workforce training and simulation and but alongside this enthusiasm and seemingly never-ending developments, there is still much uncertainty about where AI is truly heading - as indicated perhaps by the recent turmoil DeepSeek caused in stock markets – very few people know exactly where AI is going, if at all, which makes discussions like this one even more important.

With AI, whether are you in the buy-in stage, or in the believe-in stage, whether you are a user of learning services, a provider, a recipient, or simply just wanting to be informed, we are here to help you navigate the AI world in the context of learning, both the **opportunities and challenges**.

Opening Address

So Without further ado, let's start, My name is Andy Fawkes and I am Special Correspondent MS&T and I am delighted to have 3 **experts** join me to help guide you through the current AI landscape and what it means for workforce training in safety critical sectors such as civil aviation and defence.

Their expertise crucially **spans both the AI technology and the domain applications**. I am joined by.....

- Rick Adams is author of the new book, The Robot in the Simulator, Artificial Intelligence in Aviation Training. He leads the Pilot Training Conference at Halldale's World Aviation Training Summit and is a Fellow of the Royal Aeronautical Society. An aviation journalist and communicator for more than 40 years, Rick now publishes the 1st AI-tailored newsletter for commercial aviation safety and training, Aviation Voices.
- Cedric Paillard is the CEO at The Airline Pilot Club (APC), where he oversees the integration of AI technologies into aviation recruitment and training. With experience in the aviation as an Airline Pilot as well as an executive in high tech companies, Cedric leads APC's development of Amelia, an AI-powered assistant designed to enhance evidence-based training, streamline recruitment, and support competency-based training frameworks. His work focuses on leveraging AI to improve outcomes, reduce costs, and accelerate pilot proficiency in safety-critical environments.
- A former Royal Navy Officer, Colin Hilliers background is in Defence & Government, exploiting technology to support simulation, training and decision support through research & development as well as implementation of new technologies in established programmes. Colin is now the Chief Executive Officer of Mission Decisions, which provides AI services to organisations leverage Human-Machine Teaming to unlock the true potential of their most valuable assets: People & Data.

Opening Address

Before we start the conversation, let me start by saying AI is been around fro decades in one shape or form, but since ChatGPT launched in 2022:

AI is now more **accessible** than it ever has been before, literally anyone with a computer or mobile device can access it.

Its capabilities can sometimes seem almost magical, but I think we all know it can get it wrong.

Agentic AI, AGI, promise further advances.

This discussion is not about solving every problem AI might solve or cause. Instead, our goal is to help our listeners and viewers navigate this rapidly changing AI landscape - understanding its potential, its risks, and what steps they should take when considering AI in training and simulation. We want us to be a **bridge** for you between the technology and its actual application in workforce training.

Opening Address

To help frame today's conversation, we will have three key aspects of AI's rapid development that we will cover in our discussion:

1. What do you consider to be the AI is not new, but this latest wave of AI presents new possibilities. We will discuss what this means in the context of safety-critical workforce training and simulation, and **where AI is already being used**.

2. The **benefits and challenges** of AI in high-risk training environments. AI promises enhanced effectiveness but also brings concerns around data, trust, and regulation.

3. **How organisations can navigate AI's evolving role in learning**. We will highlight key considerations for those looking to engage with AI in a meaningful and effective way.

Our panel of experts brings a range of perspectives, from military simulation to commercial aviation training, and from AI system implementation to broader workforce learning strategies. Their insights will help us separate what is genuinely possible from what remains speculation.

First question:

In a few words how would you explain to the audience what AI technology or technologies, current and near future, are in the context of workforce training, and do you have some actual use cases you could share?

....

Next webinar will be early Summer.

Human Data

Data Exploitation in Military Training

- USAF Pilot Training Next & Pilot Training Transformation initiatives
  - Explored wearable biometric devices to collect and monitor physiological data, such as changes in heart rate.
  - Instruction was assisted by data collection software and artificial intelligence-based applications designed to assist students in identifying training tasks for self-guided learning.
- The British Army's Collective Training Transformation Programme (CTTP) has placed emphasis on training data exploitation:
  - "data will be captured and exploited to drive change and efficiency … creating the ability to dynamically control the training environment to set an appropriate level of complexity and challenge … and bring data to a single place for analysis, with common data standards enabling an ambitious use of data analytics pan-Army"
- UK Royal Air Force (RAF) Project iDAS (immersive Data driven Airmanship Simulator)
  - Aimed at helping the explore the benefits of data analysis to assess pilot behaviour and identify characteristics of good airmanship.

US Congressional Research Service Report - U.S. Air Force Pilot Training Transformation (PTT) - Jan 23

Warfighter Digital Twin?

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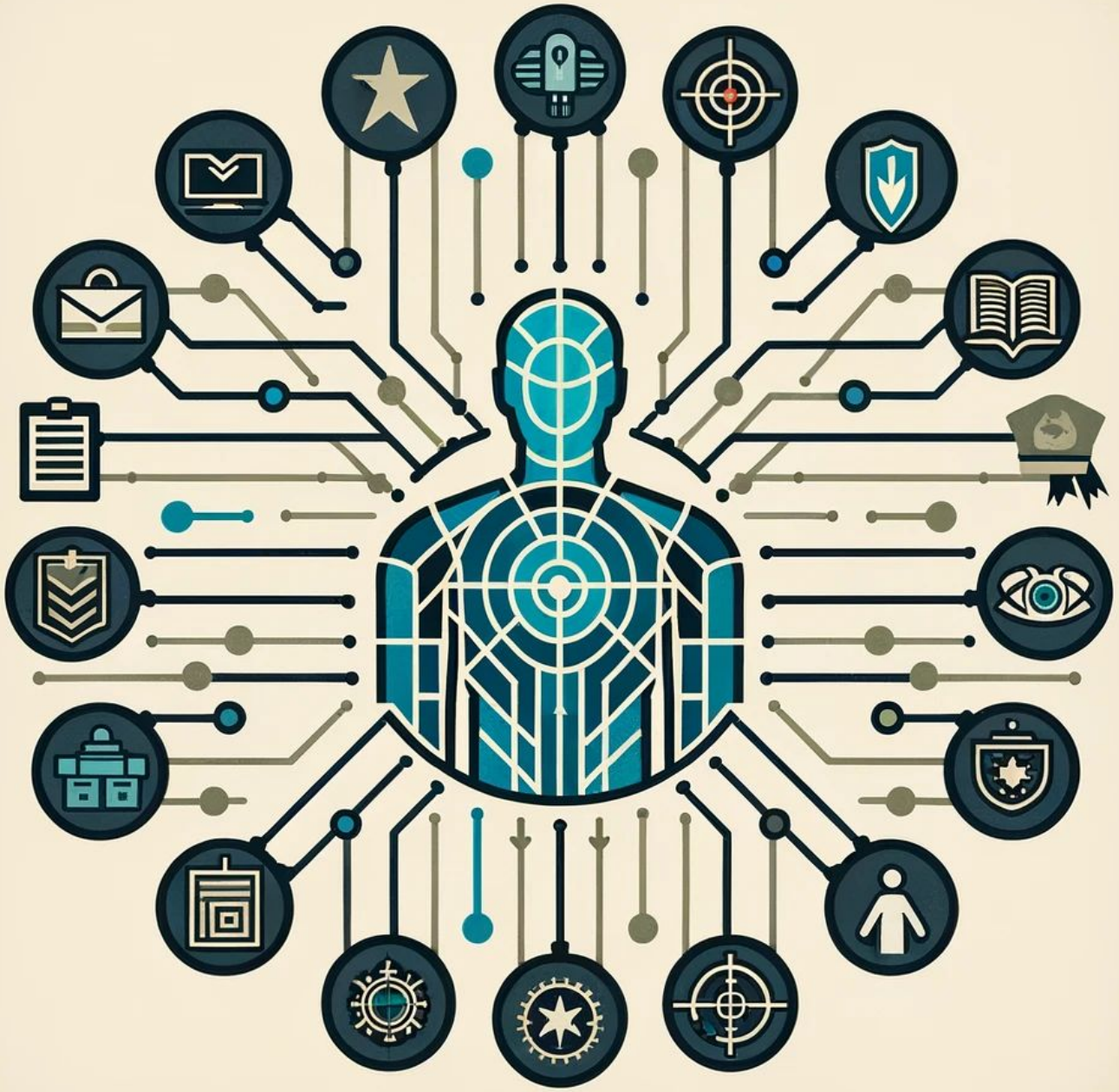
Uniting Warfighter Data across multiple applications including training & education, operations, health, research, acquisition, & career management

Digihuman?



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Some Challenges

Bad Days & Bias	Can training performance during personal struggles negatively impact a warfighter's career permanently? Balancing data-driven insights with fair evaluation raises ethical and privacy concerns.
Data Standards	Getting all the different stakeholders to agree on how data is formatted and exchanged accurately and securely.
Storage Demands	Retaining all data is costly and impractical and striking the right balance between storage limitations and valuable insights will require clear retention policies and prioritisation.
Data Avalanche	Aggregating warfighter data can push its classification level, necessitating stricter security measures and potentially limiting access for those who need it most.
Security vs. Access	Finding the sweet spot between robust data security and ensuring authorized personnel have timely access to crucial information will be a constant challenge.
Ethical Dimension	Navigating the complex landscape of warfighter data privacy, security, culture, and ethical considerations demands well-coordinated planning and implementation.

Numbers of Stakeholders

- The Warfighter (!)
- Colleagues
- Commanding Officer
- Career Managers
- Personnel Policy Makers
- Recruiters
- Financiers
- Researchers
- Legal
- Operational Planners
- Acquisition Staff
- Data and IT Managers
- …

- Do Nothing is Not an Option
- Better to use own data
- We need to Unite Warfighter Data

Briefing/discussion on MSG-234 – Process

- Confirmed: DEU, GBR, NLD, USA
- TBC: CAN, ITA, POL, MS CoE

- Nominate through NMSG National Representatives

Related Groups/Work - STO

- HFM-SAS-357 RTG - Standards for Military Personnel Data and Analytics Exchanges.
  Chair: Dr Marcin Pilat (CAN) marcin.pilat@forces.gc.ca

- HFM-MSG ET-218 ET - Artificial Intelligence in Military Training and Education.
  Co-Chairs: COL Vincent Capaldi (USA) Vincent.capaldi@usuhs.edu & Dr Benjamin Goldberg (USA) Benjamin.s.goldberg.civ@army.mil

- STO-MP-HFM-MSG-375 Human Digital Twin in the Military: Findings and P[illegible]

Related Groups/Work

- NATO Learning & Technology Interoperability Group
  Cem KUMSAL ACT Staff Officer (Learning Technology) Cem.Kumsal@nato.int

- SISO (and IEEE LTSC) FOM xAPI Mapping Study Group
  Dr Katherine Morse

Career

- Air Marshal Stringer (t=retd)
- you are putting some digital baubles on an analogue Christmas tree.

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Career

- Purpose of Learning Data Standards: Enable content sharing across platforms, support development, record-keeping, and analysis.AICC: First standard (now disbanded), still in use.SCORM (1999, ADL/DoD): Standardized e-learning course compatibility with LMS.xAPI (2013, ADL): Tracks learner interactions for detailed analytics; DoD policy supports implementation.TLA (ADL initiative): Aims for personalized, data-driven lifelong learning; involves IEEE collaboration.HPML (Simulation Interoperability Standards Organization): XML-based performance assessment standard.1EdTech (US): Works on open standards (e.g., learner records, open badges, Caliper Analytics).Jisc (UK): Supports higher education with data analytics and standards (e.g., HESA, Digital Elevation Tool).Fitness Industry Standards: FIT, TCX, and GPX enable data sharing across fitness applications.