



Ministry of Defence

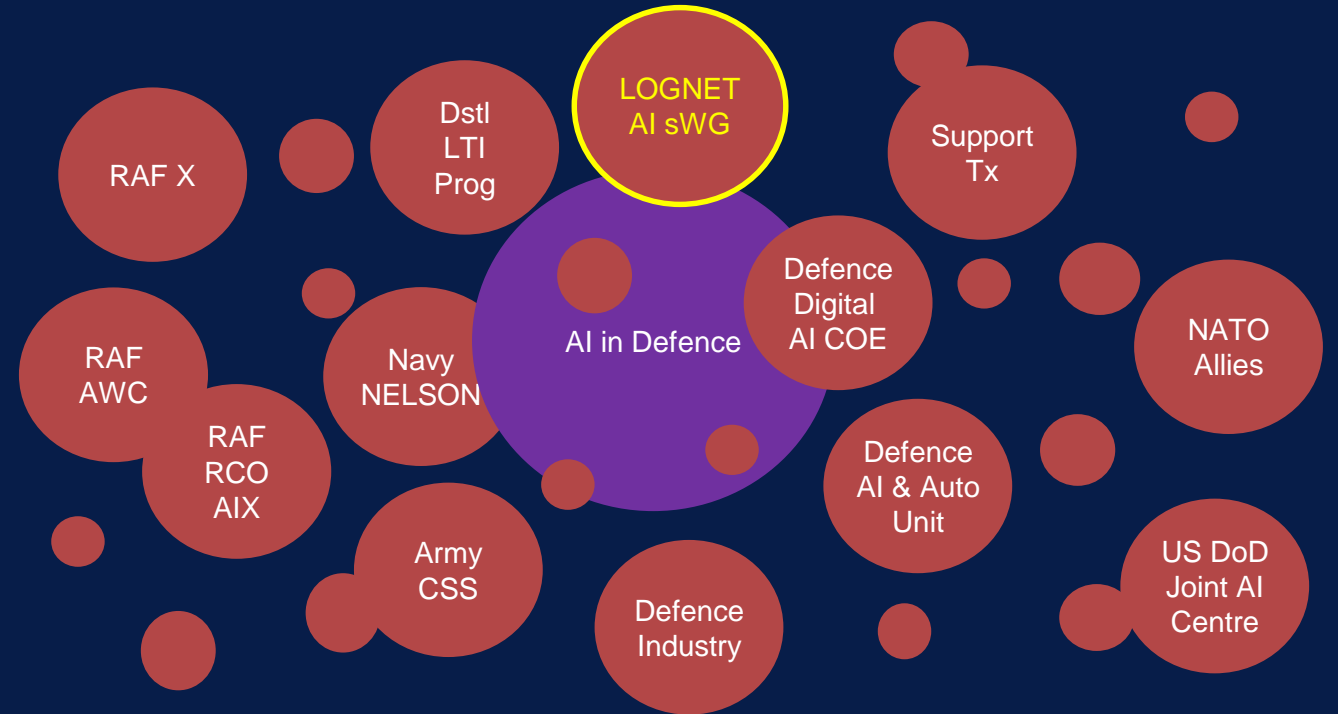
Defence Support AI sub-Working Group webinar

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AI sSWG Context in Defence Support Information Ecosystem

- Multiple Support info systems
 - Some Defence wide
 - Some Platform/capability specific
- Large volume of data but inconsistent access, storage and standards
- Limited exploitation of AI/ML to date
- Extensive array of AI exploration initiatives across Defence
- *Beginning* to treat support information as a capability



How can we use AI to improve Defence Support?

Faster ... cheaper ... more availablemore accurate ... safer ... more efficient ... more reliable... BETTER

Defence Logistics Force Development Board: Sub-Working Group on Artificial Intelligence & Machine Learning

Purpose: *To guide an accelerated development and exploitation path for Artificial Intelligence technologies across Defence Support activity.*

- **Joint** – breadth of MOD use cases and data sharing
- **Collaborative** – working with industry to derive mutual benefit
- **Transparent** – sharing outputs to encourage engagement
- **Informed** – by funded **dstl** LTI research project to capture evidence and best practice.



Defence Logistics Force Development Board: Sub-Working Group on Artificial Intelligence & Machine Learning

Will not:

- Solve every issue
- Deliver new capabilities

But can:

- Identify opportunities within Defence Support
- Initiate proof of concept and pilot projects
- Demonstrate repeatable benefits that can be scaled-up across Defence
- Identify blockers and constraints for use of AI technologies



Development activities

- Roadmap developed to guide development
- Support AI Themes defined
- Sub-hypotheses and Use Cases agreed by the Working Group
 - Pilot projects selected on basis of anticipated benefits – availability, footprint, demand, cost
 - → *3x Use Cases to follow*
- **dstl** data science and analytics work package
 - *Logistics Technical Investigations → 1300 2 July webinar by Karen Walker **dstl***
- Defence and single Service transformation programmes
- Industry activities → *e.g. 1300 30 June webinar by Andrew Gordon BAE SYSTEMS Air*

Support AI Themes

Theme	Outputs	MOPs
Scaling decisions	<i>More accurate procurement figures</i>	Cost Timeliness % utilisation/overload Reporting accuracy Touch-time effort Availability
Prognostics	<i>Generate advanced indications of a demand</i>	
Resource optimisation	<i>More efficient employment of our people</i>	
Asset optimisation	<i>Fully utilising the capabilities we own</i>	
Reporting optimisation	<i>Improved analysis of safety reporting</i>	
Inventory optimisation	<i>Achieving value for money / volume</i>	
Support Network laydown design	<i>Better use of storage and distribution</i>	

Use Case 1: Ship Corrosion Control

Hypothesis: Application of AI to RN platform usage and maintenance records can indicate likelihood of corrosion to drive preventive activity.

Problem: Using Type 23 Frigate, predict level of corrosion for each hull based on historic activity and maintenance records. Build understanding of the impact that materials, conditions and activity has on corrosion.

Goal: Reduce time and money spent on control and repair activities. Maximise hull availability and life.



Use Case 2: Foxhound Fuel Prediction

Hypothesis: AI can improve prediction of fuel usage for Foxhound vehicles based on historic usage data.

Problem: Current method of calculation relies on OEM MPG figures adjusted for op intensity, type of terrain and climatic conditions. Lived experience shows this to over-estimate requirement and surplus fuel is being transported and stored.

Goal: Improve accuracy of fuel usage prediction to reduce demand and footprint for fuel storage [achieved by Dstl with 90% accuracy].



AI-informed prediction of demand/storage achieved by DSTL with 90% accuracy

Use Case 3: Sharing C-130 data

Hypothesis: Data can be shared and exploited through interfaces between systems to provide a single 'live' picture.

Problem: C-130 usage, health and event data is managed on different systems by UK, France and US. Permissions are required to control access and data sources may be added or removed.

Goal: A digital open platform to connect data sources through common standards, allowing nations to jointly exploit data and improve engineering decisions.



Open platform achieved by industry as part of a hackathon event

Access to Data

- Multiple storage locations across a range of data warehouse systems and standalone databases
 - *Some MOD-data hosted by industry and comes with extraction costs*
- Redaction of protected fields required (personal, commercial, security etc.)
- No common process for access; each source requires senior approval
 - *Applies to internal data sharing between different parts of MOD*
 - *MOD standards for cyber and physical security apply to any organisation hosting MOD data*
- Enterprise Data Warehouse
 - *MJDI, GOLDesp, SS3, LITS, UKNCB, VITAL, CRISP, CSIS etc*
 - *Data books to interpret fields/units of measure*
- AI sWG Use Cases will generate data requests
 - *dstl can share with contracted suppliers and potentially others under NDA*
 - *Sharing data with industry requires approval for each data source*
- Test case underway (Merlin stock prediction via MJDI / GOLDesp)
- Ambition for permanent Defence Support experimentation sandbox (real, sanitised datasets)

Early Deductions

Constraints

- Defence organisation/ownership encourages silos
- Insufficient policy/clarity on data standards and access
- IP and Commercial constraints, particularly from OEMs
 - Relationship between UK data architecture to existing OEM product support data architecture
- Defence Support data science skills are limited; competing with other industries
- Need a delivery route from framework/pilots to programmes – business case for MOD and industry
- Balancing data security, IP and opportunity for OEM and Analysis/SME community

Potential way ahead

- Create a common, accessible framework – useful data from source to somewhere exploitable
- Generate relevant data from our legacy equipment
- Incorporate into the Defence Support Strategy
- DE&S has a critical role in delivery and coordination between FLCs and industry

AI sub-Working Group Engagement

Gp Capt Craig Watson, RAF

Mr Neil Morphett, Lockheed Martin

Mr Steve Green, Team Defence Information

- 1st WG 17 September 2019, 2nd WG 30 January 2020
- Webinars this week in lieu of 3rd WG
- Next Working Group – TBD – please register interest



Contacts/interest via: <https://secure.teamdefence.info/community.php?community=1000123>