Reference: LWC Op Research ORGANON Programme 23-27

22 Jun 2023

**REDACTED - STATEMENT OF REQUIREMENT**

Support for Land Warfare Centre Operational Research Branch

# ASTRID Task 335 - Project ORGANON – Application of AI & ML Techniques to Operational Analysis Tools

# Background

1. The Land Warfare Centre (LWC) Operational Research Branch (Op Research) provides benefit to the Army by applying data analysis to understand risks and gaps, overcome vulnerabilities and to shape and improve combined arms manoeuvre and support operational planning.
2. REDACTED has an emphasis on improving REDACTED to be able to win the first battle against a peer enemy. This must be complemented by a continued effort on improving survivability and resilience to ensure force elements are able to get to the first battle. REDACTED continues to improve effectiveness, but change must be enabled through enhancing education and awareness that draws upon Warfare Development (WARDEV) analysis, experimentation and experience.
3. In order to improve Field Army’s awareness and behaviours, whilst implementing survivable warfighting capability, techniques such as Artificial Intelligence (AI) and Machine Learning (ML) can enhance the LWC Op Research Operational Analysis (OA) Toolset. ORGANON’s outputs will provide underpinning evidence to support Force Optimisation, CoA selection, hypotheses development for further experimentation serials, and to ensure best use of resources and assets within Field Army
4. The application of AI & ML techniques to OA tools and activities of LWC Op Research is an opportunity that meets all below requirements:

The REDACTED Directed Task List includes at REDACTED, the following task:

* + 1. *“Identify suitable opportunities for AI & ML as they emerge, proving concept of a digital capability rapid delivery mechanism. Seeking to exploit Fd Army and JHC WARDEV experimentation.“*

JDP 0-50 UK Defence Cyber and Electromagnetic Doctrine, with regard to maintaining the edge through science and technology, states the following:

* + 1. *“A risk-based approach is employed to inform the balance of investment between the threats and opportunities for areas such as artificial intelligence, machine learning and generation-after-next technology.”*

The REDACTED Plan 2023-2030 Edn 1.0 states that:

* + 1. *“Appropriate use of Artificial Intelligence (AI), Machine Learning (ML), data analytical and data visualisation tools are employed at the point of need, minimising human errors, reducing cognitive burden, and increasing operational precision and tempo. These are essential preconditions for successful exploitation of autonomy and Human Machine Teaming (HMT).”*

In addition, the same plan includes detail in Appendix 3, Task 4.3 that places the following task upon D Info:

* + 1. *“*REDACTED *will demonstrate rapid development, integration and deployment of Artificial Intelligence (AI), Machine Learning (ML) and Automation technologies, in support of agile C2 and decision-making across all military domains.”*

# Situation

1. REDACTED has increased Op HQs requirement for OA input such that Op Research is having to prioritise the tasking of its Analysts.  Greater analytical capability will allow for the development of additional or improved tools with which to support operational planning.
2. Historically OA models have been developed to meet specific requirements, e.g. Combat Outcome, Fires, Casualties, each in bespoke formats. This has created a situation where Op Research have a number of models creating a lot of disparate data. In order to support the use of AI & ML, it is desirable to bring these models into a coherent data model.
3. The development of the Operational Analysis Tool Set (OATS) platform already has the potential to provide commonality of inputs to all OA tools, particularly ORBATs and equipment reference data.  However, it also has the potential to provide a platform for consistent outputs.  This would be an underlying database structure which could provide a central repository for all OA tool and model activity.
4. It is anticipated that the database can be populated through the development of AI players alongside existing human wargame efforts. This data not only enables ML models to be trained for a variety of use cases, but also means the tools themselves can be thoroughly tested and validated. This work is considered foundational to a desire to further adopt ML throughout the OA value chain.

# Project Funding

1. Provision for funding for the next 4 years of development has been made from the Army D Futures Research and Experimentation Programme. The Project will be managed by LWC Op Research.

# Project Delivery

1. ORGANON in keeping with other Op Research projects, will use an Agile project management methodology. Accordingly, the project will consist of an overall vision of the desired outcome and a number of sprints to develop the elements necessary to achieve that vision. It is expected that a supplier will provide the relevant roles to form an agile scrum development team.
2. To support the work, LWC/ARRC will also provide the following roles:
	1. **Requirements Champion** – prime interface with the LWC/ARRC responsible for coordinating and expressing the requirements of, and feedback from, the user community to the Supplier.
	2. **Software Development Champion** – responsible for setting and assuring the software development process to be used on this project.

# Project Requirements

1. Project ORGANON consists of these key deliverables:
	1. Development of a central OA database, to store input, output and other wargame data to a common set of standards.
		1. Creation of a data standard for ingestion of common OA datasets such as ORBATs, LOGFAS and Sitaware data.
		2. Creation of a data standard for OA wargame outputs to store within the ORGANAON database.
		3. Deployment of the database to the OATS platform at both OS and Secret.
	2. Creation of an ‘AI Player’, demonstrated through the use of CIRSIUM, capable of performing actions in the wargame and learning via the outcomes of those actions.
	3. Identification and prioritisation of AI/ML use cases, utilising the above datasets.
		1. Development of PoCs to demonstrate viability of identified use cases and associated ML methodology
	4. Development of a ORGANON application UI
		1. A functional UI to allow visualisation and analysis of the data stored within the database
		2. Configuration panel for analysts to setup CIRSIUM AI Player models, view logs and understand outcomes

# Supplementary Requirements

1. Project ORGANON must be complete by Q1 2027.
2. ORGANON should be easily deployable to a wide range of settings, and have a classification no higher than OFFICIAL-SENSITIVE. Once it has been loaded with data it may take on a higher classification as appropriate.
3. Detailed discovery and scoping exercise to be completed in year 1 which will inform future year’s development. This is likely to include identification of tools and data in scope, data migration, database technologies and types of ML/AI to be used. This discovery output should include developer ready agile epics / user stories for all deliverables.
4. All deliverables should be delivered in accordance with agile principles, with Alpha, Beta and Live phases.
5. All deliverables should be well documented, code commented, linted and clearly structured.
6. Generate and action a detailed Validation and Verification plan that will clearly fulfil the test needs of each of user requirement. This would be met through a mixture of user testing, surveys, peer review and carefully controlled validation/usability activities.
7. An ‘architecture on a page’ document is to be created and maintained to enable clear visibility of the planned and future software architecture for all parties.
8. The Customer will be responsible for external assurance of the deliverables, with support and guidance from the Technical Lead. The Supplier will be responsible for the internal assurance of deliverables, again with support and guidance from the Technical Lead.
9. The supplier should propose an appropriate governance regime, this is likely to include regular programme meetings, project risk register, lessons and quality assurance.

# Deliverables

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| ID | Description | Date |
| 1 | ORGANON discovery output including full project plan | Sep 23 |
| 2 | Draft data standards & database model | Dec 23 |
| 3 | Database and data standards deployment to OATS | Mar 24 |
| 4 | Development of AI Players | Mar 25 |
| 5 | ORGANON UI application deployed to OATS | Mar 25 |
| 6 | Deployment of AI Players to OATS | Dec 25 |
| 7 | AI/ML discovery output and initial PoC development | Mar 25 |
| 8 | Implementation of down selected AI/ML use cases to OATS | Mar 26 |
| 9 | Full technical reports, all elements live and approved by LWC. | Mar 27 |

# Payment

1. The Supplier will be paid on satisfactory progress and completion of Project Deliverables within a Limit of Liability or a Firm Price contract, likely consisting of several agreed Lines of Effort (LOE), Work Packages and supporting Deliverables (terminology to be agreed) which will be endorsed and accepted by LWC Op Research.