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Statement of Requirement for the R-Cloud Information Systems Strategic Capability

Introduction:

The Defence Science and Technology Laboratory (Dstl), which is part of the UK Ministry of Defence (MOD), is refreshing its commercial agreement for Science and Technology (S&T) research contracts, known as R-Cloud (Research Cloud).

MOD places extensive fundamental, experimental and applied research with industry and academic suppliers and wants to broaden access for this supply base, reducing the cost of trading with MOD and enabling agile contracting. R-Cloud complements MOD's other contracting mechanisms and academic and industry suppliers of S&T research are now invited to apply to join MOD's research supplier community within the Information Systems Strategic Capability.

This statement of requirement relates to suppliers joining R-Cloud within Information Systems capability area. R-Cloud provides a low barrier to entry for potential suppliers and offers direct access to MOD's current and future research requirements. Academic and industrial suppliers of Information Systems are invited to apply to R-Cloud if you are a supplier of Science and Technology Research in this area.

Comms & Nets encompasses a broad range of technical areas, not limited to but including, securely communicating data and information between people and machines, as well as organisational structures to understand, decide and act.

Information Systems - Statement of Requirement

Information Systems Strategic Capability encompasses S&T capabilities that develop, demonstrate or support options for Command, Control, Computing, Planning, Targeting, Information Processing and Intelligence Production. This includes enabling capabilities such as those that improve the defence and protection of digital data and the supply chain or provide situational awareness and understanding to decision makers. It also includes development and implementation of tools and techniques to support directly intelligence operations, including support to the intelligence analyst.

Information Systems is the S&T required to support MOD to achieve Information Advantage.

In the increasingly Contested, Congested and Constrained information environment of the Information Warfare age this assurance requires continuous Science and Technology (S&T) effort to maintain a leading edge over adversaries. Research required to offer the Defence and Security community the opportunity to consider new, challenging concepts and disruptive



technologies that could offer greater freedom of action, reduced casualties and reduced collateral damage

Information Systems is about the S&T to enable MOD to operate effectively in the future data driven ‘information age’; i.e. helping MOD achieve Information Advantage.

JCN 02/18, Information Advantage, states that, ‘*Information is no longer just an enabler, it is a fully-fledged national lever of power and strategic weapon, delivering both mass effect and precision ‘fire’ into the home-base, to disrupt and confuse, and agitate and radicalise. And it not only fuels conflict, it can create conflict. This is not some vision of an apocalyptic future; it is here today and it cannot be ignored.*’

Data collect	A set of traditional and evolving tools, techniques and expertise to collect data from physical, virtual and cognitive domains
Insights from data science	The application of data science, machine learning and artificial intelligence to produce insights, understanding and situational awareness
Data visualisation	A set of traditional and evolving tools, techniques and expertise to present information to the human and allow interaction with it
Intelligence production	The application of data science, machine learning and artificial intelligence to produce intelligence products, including hypotheses generation, credibility measurements and COA options
Information Architectures*	Expertise to be able to logically connect new, legacy, stove-piped, international and cross-government information architectures to enable information sharing
Data labelling*	A set of evolving tools, techniques and expertise to prepare data for processing through the application of metadata
Data handling, storage and retrieval*	A set of traditional and evolving tools, techniques and expertise to handle, store and retrieve information in a manner that does not burden the underlying network
Information Exchange*	A set of evolving tools, techniques and expertise to enable the sharing of information cross trust classes and cross system boundaries
Information resilience*	A set of traditional and evolving tools, techniques and expertise to protect and validate the chain of data collection through to intelligence production, including the confidentiality, integrity and availability of the information
Agile C2*	A set of evolving interventions, techniques and expertise to enable better decision making in a data-driven scenario



Influence	A set of evolving interventions, techniques and expertise to add information as an effective force lever against adversaries
Data description	A set of evolving tools, techniques and expertise to be able to deceive machine learning, artificial intelligence and humans
Cyber	A set of evolving tools, techniques and expertise to be able to deceive networks
EW	A set of traditional and evolving tools, techniques and expertise to be able to deny the EME to adversaries

Fig. 1: Information Systems Capability Element Definitions

N.B. The Capability Elements with an * are the focus of this SoR. The other capability elements are included in the SoRs of other Strategic Capabilities.

Scope of Coverage

The scope of coverage of topics related to:

1. Information Architectures includes, but is not limited to, the following:
 - a. 'Big' data analytics approaches to data processing using distributed or cluster computing architectures.
 - b. Size, Weight and Power (SWaP) issues in information systems.
2. Data Labelling includes, but is not limited to, the following:
 - a. Understanding and improving data quality.
 - b. Meta data approaches.
3. Data Handling, Retrieval & Storage includes, but is not limited to, the following:
 - a. Working with massive unstructured data sets, including temporal and spatial data from social media, logistics, weather, cultural, financial sources and from deployed sensors.
 - b. Automated entity extraction.
 - c. Information Management.
4. Information Exchange includes, but is not limited to, the following:
 - a. Secure cross-domain solutions.
 - b. Information based security solutions.
 - c. Architectural and policy approaches.
 - d. Automated discovery and exchange.
5. Information Resilience includes, but is not limited to, the following:
 - a. Technologies, processes, standards and policy associated with Information Assurance of physical and electronic data at rest and in motion.
 - b. Risk Assessment and Risk Management approaches to the adoption of emerging commercial ICT and its associated security.
6. Agile C2 includes, but is not limited to, the following:
 - a. Pan-Defence Lines of Development (DLOD) approaches to capability improvement including changes to concepts, doctrine, and training.

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- b. Individual and Shared Situational Awareness, Sense-making and Understanding.
- c. Joint and Single Service Command Battle-space Management.
- d. C2 of full-spectrum effects employing both influence and kinetic activities.
- e. C2 in distributed systems of socio-technical systems.
- f. Planning including tactical, operational and campaign level across multiple disciplines and planning with other agencies.
- g. Assessment methods, including Campaign Assessment with Indicators and Metrics.
- h. Agile adaptation and employment of user facing applications and services.
- i. Socio approaches to decision-making at pace.
- j. Socio-technical approaches to identification and presentation of pertinent information at pace.

Relevant Experience & Skills

Experience:

- Communications and IA Standards (STANAG, MIL-STDs etc.)
- Command and control systems
- Communications systems
- Cyber warfare
- Messaging and telecommunications technology
- Network security engineering
- Modern and legacy Internet Protocols routing & standards
- Computing hardware and software
- Data and signal processing technology
- ICT Network design
- Delivery of applications and services
- Cloud, edge and distributed computing
- Virtualisation techniques

Skills:

- Systems engineering
- Behavioural modelling
- Experimental and trials design, management, execution and assessment
- Mathematical Modelling methods
- Operational analysis □
- Organisational design
- System Design
- Systems Concept Development
- System Assurance