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Statement of Requirement for the R-Cloud S&T Futures and Incubator ('Futures') 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 Futures Strategic Capability.

This statement of requirement relates to suppliers joining R-Cloud within the Futures 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 Futures research are invited to apply to R-Cloud if you are a supplier of Science and Technology Research in this area.

The Futures Strategic Capability encompasses a broad range of technical areas, these are summarised here:

Statement of Requirement

BACKGROUND

Futures work focuses on understanding impact for defence and security through experimentation, analysis and development of new and emerging concepts and ideas so that we can prepare for the future.

It also aims to identify concepts with the potential to mitigate against emerging threats through development of both pro-active (offensive) and passive (defensive) means. Futures is not all about looking at threat, it is as important to look for opportunities', whether this is in existing technologies that can be innovated or to new potential technologies that can become game changers in defence and security.



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The MOD S&T Strategy has committed to the launching of a revitalised S&T Futures and technology incubation programme and whilst the details of that are still to be decided, from ongoing Futures work already undertaken by MOD we know that we will need to reach out to external suppliers for the following kinds of tasks and work areas;

- 1) The scope of work related to Futures includes, but is not limited to, the following:**
 - a. Shaping and Informing Future S&T thinking, concepts and research: Defence and Security need to understand the scientific and technical credibility of potential future threats and opportunities, to explore & test novel and innovative concepts and to access early phase research and development into disruptive science and technology.
 - b. Early Phase Research and Innovation: to understand the scientific and technical credibility of potential future threats and opportunities, MOD requires the ability to explore novel and innovative concepts and very early-phase research into potential breakthroughs.
 - c. Incremental Development: Innovations identified through horizon scanning, technology watch and early phase research can be developed further to explore their potential as disruptors in the defence and security context. Research will carry out incremental development of identified credible technologies, possibly through modelling and simulation or by building prototypes.
 - d. Horizon Scanning: the systematic examination of information to identify potential threats, opportunities, risks and emerging issues to 2040 and beyond. Work will systematically mine information from scientific and technical literature, patents, press releases and other media sources to identify developments in science and technology that are novel and emerging or that have not previously been considered relevant. This activity will track new science and technology developments in early stages of research and development in universities or private companies. Emerging clusters of technological developments will then be identified and fed into technology watch activities.
 - e. Technology Watch: Technology Watch is a form of 'focused searching' usually carried out within the confines of a domain. It is generally carried out by people with expertise in that domain.
 - f. Conceptual problems: MOD requires the ability to explore and understand conceptual problems for which it is difficult for us to specify requirements. Work will deliver activities that break down conceptual problems into more tangible and actionable research tasks to enable concepts to be explored.
 - g. Experimentation and Testing: Emerging science and technology concepts can be assessed through experimentation and testing, ranging from laboratory scale investigation through to range testing at appropriate test facilities.
 - h. Mapping future threats or opportunities to implications for defence and security across both potential ideas and technological advancements.
 - i. Efficiency Measures and Culture: MOD Stakeholders realise Defence Efficiencies from S&T (i.e. Increasing productivity or reducing costs) by acting on analysis evidence, advice and consultancy. MOD requires the ability to identify and quantify potential Defence Efficiency ideas in order to support stakeholders to exploit such initiatives. MOD is also working to identify how it can best embed a culture whereby organisational efficiency becomes Business As Usual.
 - j. Innovative Methods Models Tool: Developing and using novel tools & techniques and testing these concepts in war games to enable concepts to be explored and tested quicker and cheaper.



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- k. Sci-fi concepts: Using Sci-fi research to map to existing sci-fi concepts and ideas to emerging technologies to greater understand the art of the possible. Using Sci-fi to tell a story to benefit defence and security.
- l. Novel methods to Tell the Story: Creating innovative methods to tell stories, whether to educate, engender engagement or create compelling ways to exploit technology.

2) Examples of the type of expected work includes, but is not limited to, the following:

- a. Analysis
- b. Future world conceptions
- c. Surveys
- d. Workshop facilitation
- e. Think pieces
- f. Media production including but not limited to videos, gaming software, podcasts, and sci-fi creation with the aim of creating compelling and novel ways to Tell the Story.
- g. Consideration of problems from multiple perspectives (e.g. Other Watch).
- h. Development of multi-modal outputs/ solutions i.e. having the same question answered in different ways (method, philosophy, etc.)
- i. Exploration of ideas that will specifically challenge the way things are currently done or understood, to see if there is impact.
- j. Ability to access ideas about directed requirements
- k. Ability to access undirected ideas that might be of interest e.g. a company may have something they think may be of interest to us, but we could only access by working with them – R-cloud would facilitate that collaboration.
- l. Red teaming-existing work is 'red teamed' to provide challenge of thought
- m. Deep analysis of a potential threat; threats from, threats to and systemic/enterprise threat
- n. Problem structuring
- o. Facilitation and involvement of creative problem solving events such as; hacks, deep dives, grand challenges
- p. Software and tool development
- q. Visiting Fellow
- r. Technology Watch
- s. Quantification of the impact and financial value of Efficiency initiatives
- t. Horizon Scanning
- u. Technology Experimentation and Trials on specific technologies of interest

3) Specific themes of work include but are not limited to:

- a. Establish Future Threat and Opportunity Capability
- b. Threats and opportunity from novel and future science and technology
- c. Threats to specialist user
- d. Threats and Opportunities to Platforms and Dismounted personnel
- e. Threats to UK Enterprise level capability
- f. Future Threat Environments and Opportunities
- g. Hostile use of Automated and Autonomous Platforms
- h. Future Information Threat and Opportunities
- i. Novel Improvised Threats and Opportunities
- j. Systems Imagining for Future Technology Concepts of Use (including exploration of these using war gaming)
- k. Position Papers on key technology themes or Futures themes (eg Power & Energy or Climate Change, or Human Augmentation as examples)



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- l.** Strategic Think pieces (potentially in collaboration with MOD and wider government staff)
- m.** Telling the Story