VANTIQ

Multi-Domain Integration for JADC2

Management Summary

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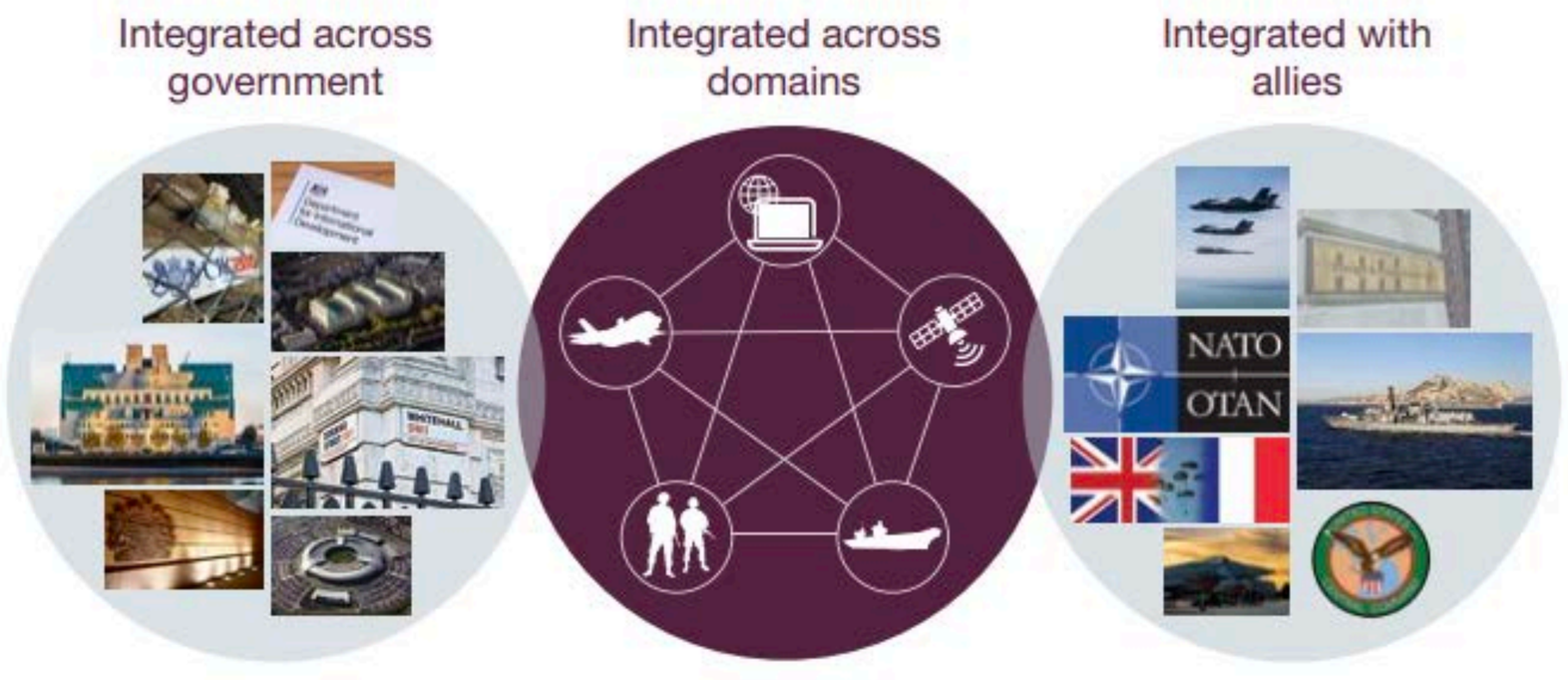
The ubiquity of IoT sensors attached to military and civilian assets, and AI that interprets the data they produce, provides an opportunity to build systems that detect, analyze, orchestrate and learn from, a set of outcomes driven by real time situational awareness of the battlespace1.

A prime example are Multi Domain Integration (MDI) systems which seek to integrate real time situational awareness with data from existing, often siloed systems, to broaden the scope of threat detection, share information more widely across stakeholders, provide insights and to react to threats in a timely manner. In practice, this means connecting such systems in real time and integrating human decision-making, as required, into any automated workflow. **This is a requirement for the effective implementation of JADC2.**

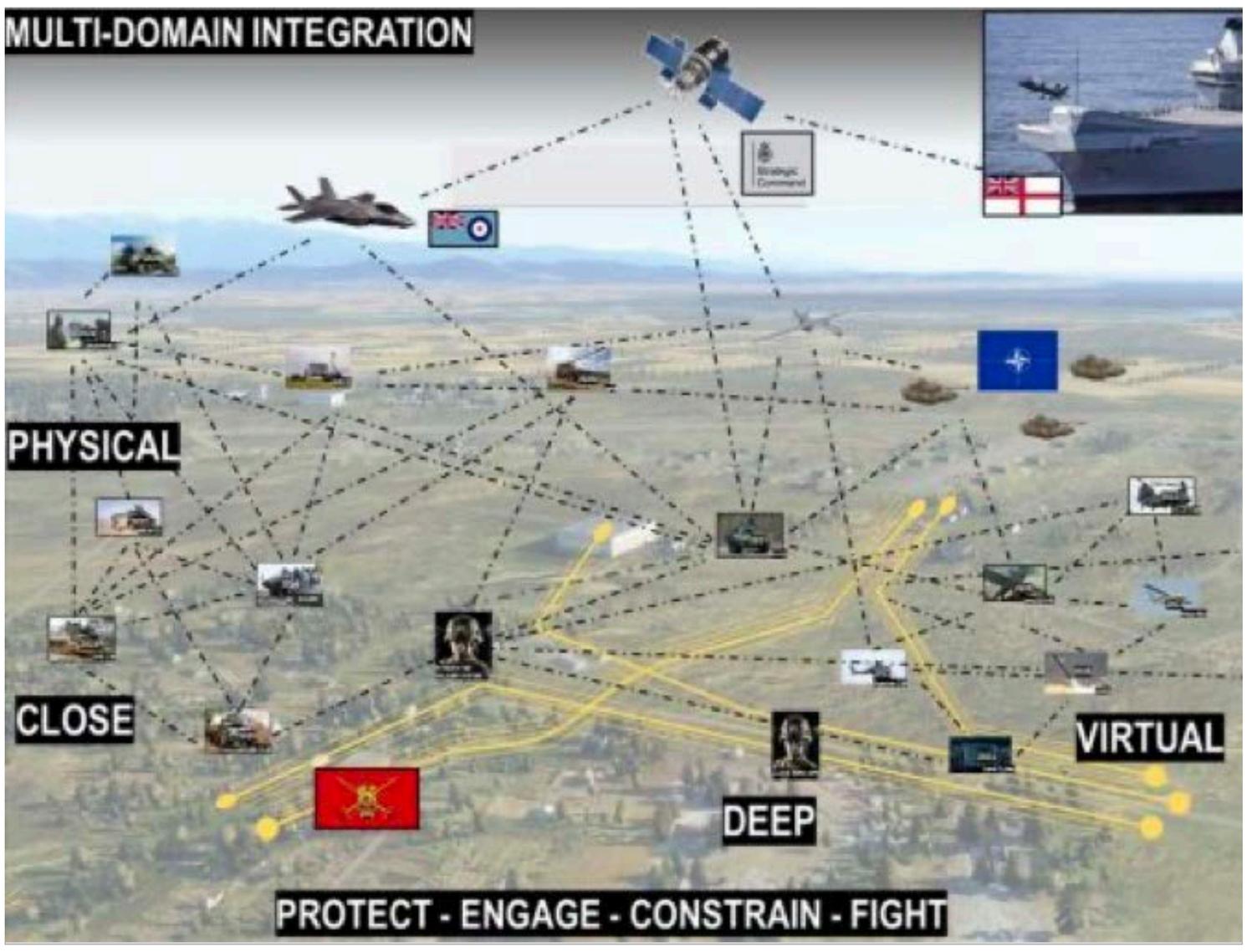


There are technological challenges. The sheer volume of available information has exploded with sensors now routinely present on military and civilian assets on the ground, in the air, at sea and in space. Processing such information in a timely manner, with filtering to separate out the signal from the noise, is essential. It is driving a need for highly distributed systems that operate both at the edge and in the cloud in real time, and it demands practical strategies for sharing data across a wide area.

Additionally, to be valuable, such systems must operate at scale and with very low latency, because the threat is constantly changing, and automated responses degrade in value as latency increases. Furthermore, such systems, if they are managing an activity of value, must be resilient to failure or attack of some component or resource.

Then there are organizational challenges. Successful delivery of MDI requires a huge cultural shift in behaviors from both industry primes and defense institutions. Exploiting experimentation is crucial and a greater ambition to pull through R&D activities at pace is needed. The use of agile methods sits at the heart of a successful approach to MDI yet, until now, the tools to build real time systems in an agile way did not exist. Learning by doing and exploiting new technology from industry cloud and innovative companies such as Vantiq, offers a practical approach to embrace the opportunity of successful MDI.

Vantiq is a platform for building and deploying streaming applications. In Autonomous Target Recognition (ATR) for example, it functions as an event-driven digital orchestration platform that sits at the intersection of streaming data, AI and other existing systems and the people that interact with them. Vantiq can take in streams of data from multiple sensors that play a role in ATR to provide sensor fusion and better situational awareness. For example, one system may provide AI for audio intelligence, while another provides object recognition, or identification. Some may use Lidar, Vision, or IR. Each sensor has its strengths and weaknesses. Vantiq can take in all streams of data and contextualize them. By joining these streams of data, the Vantiq system can identify situations of interest (for example, a threat) in real time.

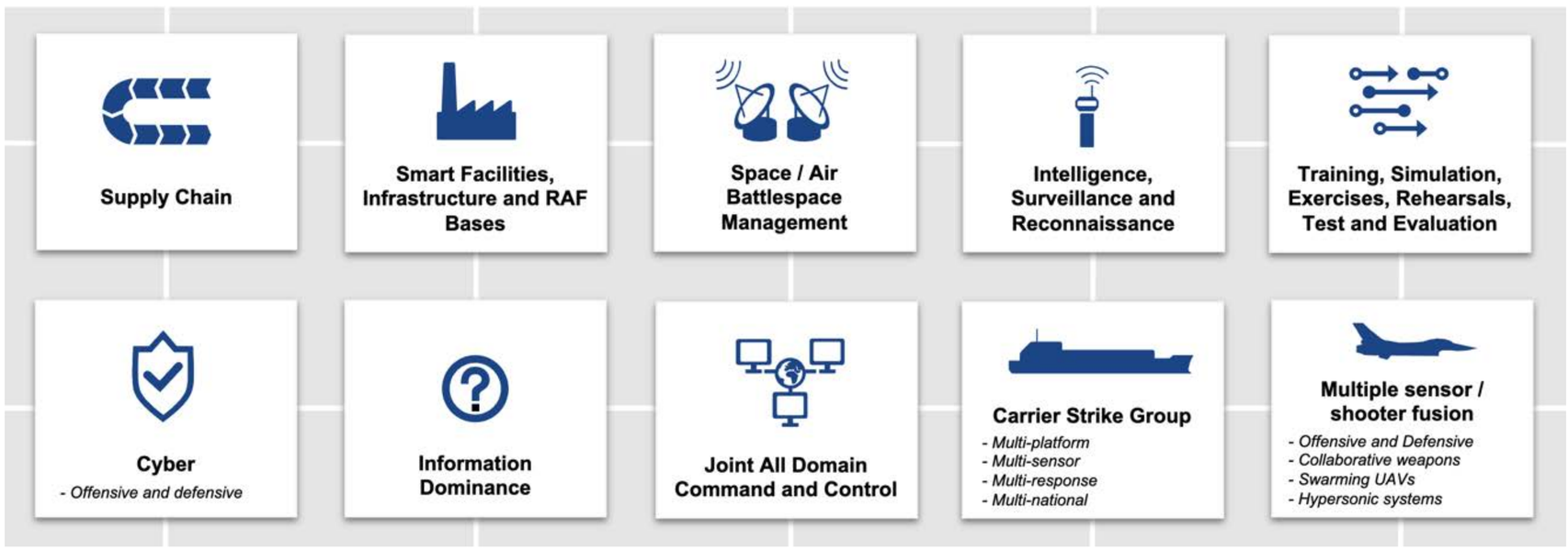


Furthermore, the Vantiq platform can uniquely collaborate across multiple systems to triage any “Situation of Interest”. Put another way, real time workflows executed in Vantiq orchestrate a response so that system users can arrive at the best possible outcome based on the most current real time data. By pushing events of interest to subscribed recipients, Vantiq enables them to take the best real time action and, in turn, feeds back decisions into the situation to provide updates and new possible decisioning/possible outcomes.

A Vantiq real time MDI application will run from cloud to edge in a federated mode (peer to peer) that allows application components with the right permission to communicate with each other, but it does not require this connectivity to operate, nor does it need a centralized leader. It supports the non-functional requirements of military and civilian systems (reliable, available, scalable, secure) to support MDI applications. Most importantly, Vantiq is a low code environment designed to enable agile development methods. It accelerates the creation of streaming MDI applications at a fraction of the time typically taken to produce applications of this kind at scale.

Call To Action

Vantiq is working with industry primes and with the defense accelerator community to realise the benefits of agile development within the MDI domain. It is simple to install and operate and allows the user to harness the most useful information from multiple systems and react significantly quicker than adversaries.



In summary, Vantiq is a dual-use technology that is applicable to a wider set of military challenges beyond MDI, as illustrated in the graphic above. What these use cases have in common is a requirement to integrate real-time, situational analysis from sensors, to analyse and enrich this information, to orchestrate an automated response which may or may not require human collaboration, and to integrate existing IT assets in an overall response. Perhaps the most valuable characteristic Vantiq offers the defense community is the means to build such systems using agile methods, thereby showing value early in the lifecycle and avoiding dead ends.

Vantiq is available on a trial basis to build technology demonstrators by interested groups. These demonstrators can be rapidly delivered, their functionality can be effortlessly extended using agile techniques, and their benefits realised in the fraction of the time taken by alternative approaches.

In today's era of constant competition and grey conflicts, the challenge of identifying useful insights and decision information from the plethora of intelligence and information available is daunting. Vantiq's capabilities are ideally suited to help address this challenge and enable effective innovations to outpace adversaries.