

Data, data everywhere, nor any drop to drink: The case for the joint integrator

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The Australian government has made very clear that, to defend the nation, the Australian Defence Force (ADF) must be an integrated force. This article contends that such a goal remains an unrealised ambition. The 2023 Defence Strategic Review (DSR) (Houston & Smith, 2023), described as 'one of the greatest shifts in Australia's military since WWII', sets out integration as one of the most critical objectives for the ADF (Evans, 2023). The DSR states that deterrence, denial and response must be built on '*...a genuine **Integrated Force** which harnesses effects across all five domains: maritime, land, air, space and cyber*' (Houston & Smith, 2023). In translating the DSR's recommendations into action, the National Defence Strategy (NDS) elevated this goal into 'national defence', i.e. harnessing 'all arms of Australia's national power to establish a holistic, integrated and focused approach to protect our security and advance our interests (Australian Government, 2024)'.

This article analyses the significant challenges faced in integrating the force, most notably the question of who is actually *doing* the integration.

The Problem

Defence has become a prodigious creator of data in recent years, a trend which will only accelerate. On one hand, this is a positive development as it reflects the growth of high quality, highly connected sensors that Defence is investing. However, the profusion of sensing capability will challenge Defence's existing sense-making capability through a deluge of data. Over the next few years, Defence will have added to its inventory Intelligence, Surveillance and Reconnaissance (ISR) platforms such as the MC-55 Peregrine, Land 129 Phase 3's Integrator platform, MQ-4C Triton, P8 Poseidon, multiple geospatial capabilities and completely new air and space domain awareness capabilities. This raises critical questions about joint data integration.

For instance, can data from the P-8 Poseidon be shared with the Army? How is an Army amphibious task force sharing its Battle Management System data with the Navy's Combat Management System? And can space domain awareness data be integrated with a Joint Task Force while underway? Under Defence's matrixed approach, each program mentioned above has a designated capability manager. With different capability managers spread across an array of projects and programs, there needs to be someone ultimately responsible for data integration.

Defence has numerous policy – and paper – based organisations, but very few are dedicated to execution (those who actually operationalise the data and are hands-on with the 1's and 0's). The challenge is not only technical but organisational, and calls for establishing clear roles and responsibilities for data integration across different domains and branches of the military. Effective integration requires coordinated efforts and streamlined processes to ensure critical information flows seamlessly between platforms, enhancing situational awareness and operational effectiveness.

The current approach

Defence has a number of organisations with ‘integration’ in their title. However, it is not clear that any one of them is addressing the enterprise problem. At the strategic centre, there is the Force Integration Division (Australian Government, n.d.a). Force Integration Division is not a technical delivery group. It does not own or control networks as per Defence Digital Group, and their role stops largely at analysis and advice. At the other extreme sits Army’s Land Network Integration Centre, which has demonstrated a significant ability to integrate systems, but as an Army’s network ingestion organisation it does not control the networks for other services or Joint systems, bearers or standards to integrate Defence’s proliferating data systems (Robards, 2024; Australian Army, n.d.).

In August 2021, Defence announced the creation of the Chief Data Integration Officer (CDIO), whose role within Data Division reports directly to the Department of Defence Diarchy to provide advice and guidance (Hastie, 2021; Hendry, 2021). The Capability Acquisition and Sustainment Group (CASG) recently migrated its integration area, but again, it was a governance and policy-based group and not focused on execution.

Defence Digital Group, formerly known as Chief Information Officer Group, which owns the Information and Communication Technology (ICT) Defence corporate networks has a role in Defence mission systems, but only when they want to connect to the corporate network (Australian Government, n.d.b). They also aren't necessarily the group responsible for data storage nor the data integrator. CASG’s Tactical Data Link Bureau manages some joint data links, but only some and not bulk ISR data.

Defence’s recent Digital Engineering Strategy 2024 is another weighty tome but light on guidance as to who is responsible for the actual conduct of joint integration of the digital engineering. The conceptual digital engineering capability lifecycle model presented in Appendix A of the strategy has the least amount of detail in the “in-service” column, where, in reality, it is where the rubber meets the road. (Department of Defence, 2024)

Put simply, in the Defence organisation, it is confusing where the boundaries lie and who is responsible for doing the work to create a “*genuine Integrated Force*”. It does appear that there is no data integration agency whose job it is to store bulk ISR data, convert data feeds, and connect it to capability elements. It also begs the question as to how many policy and governance organisations can provide robust advice without in-house expertise. Advice and guidance about data without real-world data experience is fraught with danger.

As an example, Air Force acquires a fleet of ISR aircraft, with each platform containing 40 systems. Each of these is an ICT system in its own right with proprietary software, firmware and its own data needs. The fleet is acquired off the shelf from the United States (US) as a foreign military sales (FMS) acquisition, meaning Australia has not built it, nor do we have the technical workforce to do so. Inevitably, this fleet will be part of a spiral upgrade program with its original manufacturer, during which most of the sensor systems will upgrade to newer versions. This creates an exponential integration problem as the first platform will be running new systems than the older platforms. Air Force will be responsible for ensuring integration in its own air domain – something that the report by the Australian National Audit Office into the unlamented Tiger helicopter notes is often incredibly difficult (Hehir, 2016). Who, then, is undertaking joint integration as this spiral of spirals continues?

Current project-based approaches can exacerbate silos by their very design of individual projects to solve their problems individually. Defence had at least three geospatial projects, one for the Navy, Army, and Air Force, where each service had “unique” needs respective to their service. They were each allocated funds in the Integrated Investment Program (IPP), but that spend was allocated in silos to each project. Each individual project would not risk affecting its own schedule by collaborating with another service doing very much the same thing with the same data. Defence needs to ensure its systems can interoperate not just with each other but also with all types of allies, domestic, foreign, sophisticated and

unsophisticated, classified and unclassified.

The US Air Force have recently appreciated this problem and have pledged to stand up an Integrated Command Capabilities by the end of this year in an attempt to keep up with the modernisation efforts and tempo of modern warfare (Easley, 2024).

A better way

The NDS proposes that Defence capability needs to be conceived across three epochs (Australian Government, 2024, p. 28):

- now to 2025: the **Enhanced Force-in-Being** will focus on immediate enhancements that can be made to the current force.
- 2026 to 2030: the **Objective Integrated Force** will see the accelerated acquisition of critical capabilities.
- 2031 and beyond: the **Future Integrated Force** will see the delivery of an ADF that is fit for purpose across all domains and enablers.

Noting that “integration” initiatives appear to start in 2026, what then is to be done? To increase Defence’s integration—rather than drown in the data it is set to generate—structural governance and procedural reform are required.

Defence would benefit from an enterprise-wide approach akin to the Land Network Integration Centre, a Joint Network Integration Centre (JNIC). This hands-on group’s remit would be to bring together disparate information feeds and create common repositories at all classifications. As well as ensuring Defence gains skills and knowledge to deliver integration, it would also ensure that policy and governance are grounded in evidence and knowledge. A JNIC would be responsible for implementing standards and policies from the CDIO in the Data Division and the architectural patterns of the Force Integration Division at the Integrated Force level via networks handled by the Defence Digital Group.

Data must be handled and managed according to the *Archives Act 1983 (Cth)*. That means data custodians must ensure end-to-end data providence, where data can be tracked and traced from generation to archival. A key aspect of this policy is boundary points, such as once data has been generated by a sensor platform, there is a transfer of custodianship from the collector to the point of aggregation.

Murphy’s Law tells us that battles are always fought at the edges of maps, a problem which can be overcome by extending with more maps using sticky tape. But when our future battles occur at the edges of our data, whose job is it to sticky tape more data?

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