



READY TO ROLL

Matt Medley reveals factors not to miss on the march towards Total Asset Readiness

The US Department of Defense defines operational readiness as “the capability of a unit/formation, ship, weapon system, or equipment to perform the missions or functions for which it is organised or designed.” While Total Asset Readiness can sound simple phrase, actually achieving high availability across all equipment in a defence force can be a highly complex task.

When planning critical missions, commanders must know that their assets are in a state of complete readiness – an inaccurate or partial picture of the state of their force is not good enough. A failure to achieve the required level of asset readiness cannot only compromise critical missions, but can mean wasted personnel time and expenditure.

Readiness issues are a constant irritant for military forces. Every new generation of assets, including the F-35

have their issues. Based on data from fiscal year 2019, the director of the Pentagon’s Operational Test and Evaluation Office said all variants of the aircraft remain: “below service expectations”, with a goal of 65 percent availability. The German army in early 2020 had its own readiness issues, with its armed forces commissioner stating: “the defence ministry had failed to significantly improve the combat readiness of Germany’s main weapon systems, such as aircraft, ships and helicopters – a problem that has dogged the Bundeswehr for years.”

The days of the ‘traditional’ model of the military purchasing complex assets from the original equipment manufacturer (OEM), then assuming responsibility for maintaining that asset throughout its lifecycle are gone. Military asset procurement, support and sustainment has been evolving for years now.

It is essential for commanders to have a clear, real-time image of the assets available to them in the context of the mission they have to complete

The military has ascended the ‘transformational staircase’ of asset procurement and support since this scenario. The initial stage of contractor assistance was termed as buying ‘spares and repairs’ from OEM’s. The next stage, the availability and risk associated with supporting an asset through its lifecycle has increasingly involved industry assistance. The accepted model for the procurement and support of military equipment is now a performance-based logistics (PBL) basis.

PBL strategies work effectively when attached to certain assets or asset components such as engines and other complex parts. But when it comes to force-wide asset mobilisation, these service-based agreements can go to another level—what IFS deems “Total Asset Readiness”.

The ‘next evolution’ is focused on putting a consistent and clear framework into effect across a military fighting force. To give commanders a clear, real-time, image of the assets available to them in the context of the mission they have to complete, disparate software systems and reporting mechanisms can be consolidated using an all-encompassing solution that can track asset readiness.

The US Navy’s, Naval Operational Business Logistics Enterprise (NOBLE) project is an example of a military organisation targeting such an approach. With an overall aim to improve shore and material readiness, the programme is reported to target consolidation of over 23 standalone application systems and 700 database/application servers.

Implementing an Integrated Data Environment requires the close collaboration between industry and military players, as they encompass hundreds of thousands of users and thousands of assets. With this to consider, there are five key areas that have to be focused on in order to achieve Total Asset Readiness.

1. INTEGRATED DATA ENVIRONMENT

The development of an Integrated Data Environment across the entirety of a fighting force, involves a scale which can be larger than even the largest businesses. A recent report showed that going from analysis of technology system alternatives, defining the requirements, right through to initial operational capability typically takes corporate technology companies between six and nine months to complete. For the Department of Defense it takes an average of 91.

Military deployments can require upwards of 100,000 users needing to have access to at least some elements of a software platform – with each of those users requiring different permission sets and roles. It is this level of security complexity and massive scale that makes integrating, development and activation of an IT system an arduous task.

It is here that the strategic use of APIs can help to reduce implementation time and link previously unconnected IT systems. Already referenced was the large amount of newly accessible data, which is generated by military assets, but these data streams may have been previously produced in siloes through more than 20 separate systems. Therefore, for an Integrated Data Environment to be useless it must strategically utilise APIs to ensure data is both visible and delivered to the correct person at the right time.

2. UP CLOSE AND PERSONAL

According to Deloitte, Industry 4.0 technologies rise will have a largely positive effect on the readiness of assets –

bringing an approach to availability based on real-world data. While the USAF has placed the use of predictive analytics as a priority in addressing a readiness slip in its 5,400 strong fleet of aircraft. Meanwhile the US Navy has chosen a framework that leverages technology including the Internet of Things, predictive analytics, blockchain and Artificial Intelligence.

FAILURE TO ACHIEVE THE REQUIRED LEVEL OF ASSET READINESS CAN COMPROMISE MISSIONS

IoT-enabled sensors on individual components provide large data sets on the status of given assets wherever they are – a subsystem like an aircraft engine for example can produce terabytes of data during a single flight. Analysis of this data through the use of AI/machine learning functionality in enterprise software means proactive steps can be actioned to shift maintenance of connected assets to a more predictive process than was possible before. Work on the F-35 ALIS project is an early example, although the software used to support the aircraft had initially been designed before the first aircraft came off of the production line, so capabilities available today surpass even this.

In many cases these data-producing assets are deployed within a disconnected setting, in hostile environments without forward infrastructure and often with a stipulated mandate to keep operational security. Software infrastructure must therefore also be configured to support disconnected operations, which means consolidating, aggregating and storing both data and technical records in such a way they can be sent once a connection is re-established.

3. MANAGING EXPECTATIONS

From two perspectives, accessibility and representation of asset data is as important as accuracy. First, at a time when industry technicians and military personnel are making use of intuitive apps within their everyday lives, ease of use by industry experts, commanders, maintenance controllers and other users is crucial for a universal software system. Considerable importance must be placed upon the user experience (UX) and user interface (UI) to ensure the system is streamlined and usable for the end-user, right down to the individual screens for specific task requirements.

Second, with a lot happening at the back end of an IT consolidation project such as this – apps are at the centre of this. Several layers of technology exist in the middle of this tech stack that are invisible to the end user at UX level, but which drive how the software is delivered, particularly in application form.

Containerisation is important and involves bundling an application with all of its related libraries, configuration files and dependencies required to run bug-free and efficiently in a number of different computing environments. A ‘docker image’ can be created to pack an application and its required running environment, effectively allowing an app to be reproduced, scaled and used on desktops or any mobile devices securely.

4. SECURITY AND INFORMATION ASSURANCE

From a security standpoint, as is a pre-requisite with any military infrastructure deployment, a containerisation approach has its benefits. Any military software solution has to be deployed in a secure environment, meeting strict regulatory requirements such as International Traffic in Arms Regulations (ITAR), the US DoD Cybersecurity Maturity Model Certification (CMMC) Version 1.0 and cloud security mandates.

While management of finely tuned permission sets and roles become critical as organisations up-scale their user base, other considerations also have an effect. Operational security, for instance, often mandates rigid controls on who within a contractor's organisation and their supply chain has visibility into inventory and part status based on user roles and permissions.

Additionally, electronic signatures are increasingly becoming essential to guarantee full traceability and transparency for investigatory and audit purposes. Total Asset Readiness must therefore incorporate such ever-evolving requirements while constantly being up to date with the leading edge of new and emerging security threats, unknown and known.

5. DYNAMIC DASHBOARDS

Excel exports and snapshot reporting need to become a thing of the past – going forward, highly configurable and dynamic dashboards will allow command centres to see precisely what assets are ready across all forces for a specific mission.

The end result of software infrastructure consolidation needs to translate into something which can give commanders a current and accurate image

of their overall asset readiness – represented typically as a force-wide availability percentage. How can you tell if your assets are available if data cannot be represented in a dashboard, which is configurable to a commander's needs?

Systems that support RESTful APIs at the back end can combine information from several data streams, allowing personalised information insights to be delivered direct to commanders. KPIs can be added into reporting to be tracked in real-time in accordance with the force in question. When it comes to readiness examples, there are different requirements for nuclear forces versus a non-weapon carrying aircraft squadron running C-5 Galaxy aircraft.

APIS CAN HELP TO REDUCE IMPLEMENTATION TIME AND LINK PREVIOUSLY UNCONNECTED IT SYSTEMS

A single software environment, fully integrated across a fighting force to measure asset readiness, means a commander will always have the status of assets at their fingertips. Total Asset Readiness enables defence organisations to achieve tasks and mission objectives each time, on time, with significant reduction in sustainment costs.

Should an unexpected issue arise, such as a vehicular asset requiring a refit, it can be factored into the operational planning procedure and easily addressed. With the power of Total Asset Readiness at their disposal, commanders will never again have to answer: "What assets are available to you?" with: "I don't know" ●

Matt Medley is Senior Product Manager, IFS. In his current position he ensures IFS solutions meet the demanding needs of defence service and support organisations, defence manufacturers and defence operators and helps bring these solutions to market.

IoT-enabled sensors on individual components provide large data sets on the status of given assets wherever they are

