Defence

Delivering Public Service for the Future

Smart, mobile and wearable: The next generation of defence technology maintenance systems

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The next generation of defence technology maintenance systems

As the nature of modern conflicts has evolved, so too have military assets and defence technology. Aircraft, warships and land fighting vehicles increasingly include advanced stealth and detection avoidance features. They also incorporate cutting-edge defence technology management and monitoring systems that allow greater awareness of equipment condition and performance.

Antiquated processes on antiquated systems

However, behind the scenes, today’s crop of military assets are often supported by outdated defence technology maintenance systems. These lumbering systems largely emulate yesteryear’s paper-based, form-driven approach, putting productivity-sapping demands on maintenance crews.

For example, technicians are typically required to spend large amounts of time navigating complex software and recalling dozens of obscure transaction codes, often from a computer distanced far from the point of maintenance.

Military assets wasted

Added to this, defence technology maintenance systems haven’t kept pace with the advances of military assets.

Lockheed Martin’s F-22 Raptor and F-35 Lightning II aircraft, for example, have hundreds of monitoring sensors, yet many defence technology maintenance systems aren’t equipped to make effective use of this data.

As a result valuable capabilities of highly expensive assets are not being fully utilised.

Deficient view of mission readiness

Aside from the productivity implications, there is a greater concern. The limited, outdated information that today’s systems offer can leave military leaders with an alarmingly deficient view of mission-readiness.

Five attributes of a next generation system

By focusing on the business objectives and incorporating digital technologies, the next generation of maintenance systems can help defence to radically improve capabilities and performance. These systems will have five key attributes:

1. Role- and Asset-driven

   Rather than being form-driven, the next generation of defence technology maintenance systems will be role- and asset-driven — built with the business objective and user experience at their core. In doing this, defence maintenance can realise more efficient business processes in a modern, digital-enabled environment.

   How would this look in action? Currently, to engage with a maintenance application, a technician’s first thought is, “What transaction or form do I need?” In a role- and asset-driven application, a technician would simply input or scan the serial number of the asset under review and the system would immediately show all valid options available — from the current availability of parts, to insights on why a particular fault may be occurring. The application would then guide the technician through a logical workflow to the desired outcome.

   This intuitiveness would streamline operations and increase equipment availability, while reducing training requirements and input errors.

2. Built for Analytics

   Maintenance data is rarely available organisation-wide to provide more strategic value, and this needs to change. By designing a defence technology maintenance system with analytics in mind, defence can create a data supply chain that flows easily and usefully across the organisation. This can provide insights ranging from the condition of a single item of equipment, to the availability of a fleet, to the preparedness of an entire force.
With the next generation of ‘smart’ maintenance systems, when a technician identifies equipment as unserviceable, it will immediately trigger a series of alerts throughout the data supply chain: equipment availability to planning staff; the parts requirement to procurement; failure data to engineering; and readiness information to commands.

With defence technology enabling the accurate capture and consolidation of data, maintenance will move from descriptive to predictive. The value of this could be considerable — public sector organisations that implement predictive asset maintenance have realised 15% to 30% cuts in their total maintenance costs, providing a ten-fold return on investment. Even more crucially, such initiatives have reduced breakdowns by up to 75%.2

3. Mobile-first environment

While mobile devices have crept into today’s defence technology maintenance environment, they often provide on-the-go access to existing applications — only embedding the form-led processes from which we need to evolve. Tomorrow’s systems will be designed mobile first, leveraging the cloud and wearable technology.

The benefits of this are already being seen in the aviation industry. Japan Airlines engineers recently wore Google Glass to transmit aircraft images to maintenance specialists. The specialists were then able to feed any issues back to the engineer on the ground, assessing far more aircraft than if on site.3

4. Single device, multiple apps

As seen in the consumer and business space, apps on mobile devices can open up endless new possibilities for accessing information and streamlining tasks. The opportunities for defence maintenance and the broader logistics environment are vast.

There is potential for networked tablets with a range of inexpensive apps to replace single purpose devices such as Portable Data entry Terminals (PDETS). A single device could be used to record maintenance and performance data and to access information such as documentation for an obscure part, procedure manuals, or a live register of warehouse stock.

Apps that present context-sensitive information specific to the task at hand, based on the user’s location or job function, are being successfully deployed by logistics firms. Location-aware delivery apps used by DHL automatically bring up a delivery confirmation screen on a driver’s mobile device on reaching their drop-off destination, simplifying and accelerating the task.4

5. Support self-diagnosing assets

Equipment manufacturers are increasingly building self-diagnostics capabilities into their products to monitor performance and flag potential problems.

Caterpillar enables remote monitoring of its mining machinery to identify conditions that are degrading component life. Through this, a BHP Billiton Mitsubishi Alliance coal mine in Australia saved more than US$1 million a year in transport costs alone, purely by extending the maintenance cycle of its dozers.5

Similar functionality is appearing in military assets. The Joint Strike Fighter features a host of sensors that can automatically transmit condition and usage information back to base when flying overhead, advising of core system health and performance.1

Embracing digital for mission success

Far from being ‘nice to haves’, these five attributes are rapidly becoming essential. It’s clear that, to effectively service a modern military and its assets, defence technology maintenance systems need to evolve.

As a backdrop to this, many defence spending reviews are seeking ways to implement more flexible and responsive maintenance support arrangements to make optimum use of people and assets.

The answer to both lies in embracing digital and its transformative capabilities.

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About Delivering Public Service for the Future

What does it take to deliver public service for the future? Public service leaders must embrace four structural shifts—advancing toward personalised services, insight-driven operations, a public entrepreneurship mindset and a cross-agency commitment to mission productivity. By making these shifts, leaders can support flourishing societies, safe, secure nations and economic vitality for citizens in a digital world—delivering public service for the future.

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