Increase military asset readiness with a powerful combination of cognitive technologies

Uptime and asset availability are crucial to mission success across the armed forces

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Executive summary

Readiness—the US military's ability to perform its required missions everywhere, all the time—is shaped by many factors. In addition to the abilities and well-being of military personnel, *readiness* includes the availability, uptime and performance of military equipment. In turn, readily available equipment saves time, money and lives.

Cognitive technologies that help predict and prevent equipment failures, and prescribe remedies for maintenance technicians, can have a positive impact on military equipment across the US armed forces.

At this writing, Congress passed the National Defense Authorization Act, which includes provisions for modernizing military equipment and enhancing *readiness*. Defined broadly as the ability of the US armed forces to perform their required missions, whether against near-peer or asymmetric threats, readiness is shaped by many factors. Among them are the ability and well-being of military personnel, and the availability and performance of military equipment. These elements depend on procurement cycles, sustainment resources and supply chain risk management.

> *"As a member of the National Guard for 31 years, I have seen firsthand how defense budget cuts have had a profound impact on our readiness capabilities. When these budget cuts began, North Korea's missile program was not advanced enough to potentially strike the US mainland with a nuclear weapon; ISIS did not exist; Syria was not a failed state; and Russia had not illegally annexed Crimea and invaded Ukraine."*[1]
>
> — Rep. Trent Kelly (R-Miss.), in Northeast Mississippi Daily Journal, 28 August 2017

Readiness is a cross-military imperative

"Objective evidence of a readiness shortfall is difficult to find, but that does not mean the shortfall is any less real," says the Bipartisan Policy Center. It's difficult to precisely measure military readiness. Despite the Pentagon's reluctance to publicly detail US military preparedness, military leaders have testified about their concerns regarding *full-spectrum readiness levels*.

Then-Chairman of the Joint Chiefs of Staff Joseph Dunford testified that the Army, Navy and Marine Corps wouldn't be able to address readiness challenges until 2020, and that the Air Force "could take until 2028 to be sufficiently ready for their full-spectrum missions."[2]

Gen. Gustave (Gus) Perna, commander of the U.S. Army Materiel Command (AMC), repeatedly stresses readiness as the Army's most fundamental priority. Of AMC's mission, he says "Readiness is the Army's No. 1 priority, and materiel readiness is the reason Army Materiel Command exists ... AMC is involved in every Army process and operation."[3]

Secretary Heather Wilson spoke in August 2017 about the five Air Force priorities of restoring readiness, cost-effective modernization, leadership development, innovation and strengthening alliances.[4]

On the Air Force side, pilots need a certain number of training hours per month to stay accredited. Because many aircraft are two decades old or more, they are grounded too often to generate required flying hours.

On the Navy side, ship maintenance can be delayed or put off entirely, owing to budget constraints. When ships finally get refurbished, there can be many more problems than anticipated—meaning they're in the shipyard much longer than was estimated.

"Our priorities are unambiguously focused on readiness—those things required to get planes in the air, ships and subs at sea, sailors trained and ready."[5]

— Senior Navy official

Obstacles to equipment and asset readiness

The armed services face monumental equipment and asset readiness challenges regarding uptime and availability, including the sheer volume and range of equipment and the impact of budget cuts on equipment health and deferred maintenance.

According to *Navy Times*, reporting on a recent Government Accountability Office (GAO) assessment, "equipment casualties that limit the missions of the 29 ships of the resupply fleet have surged 77 percent in the past five years, from 69 in 2012 to 122 in 2016." Further, mission-limiting casualties among at-sea refueling ships—or oilers—have increased 250 percent over the past three years, mostly due to aging engine and diesel generator failures.

And, says *Navy Times*, "fast combat support ships have seen operational availability drop from 289 days to 267 days since 2012, while oiler availability has dropped 16 percent, from 253 days to 212 over the same period, the report states." GAO says the declines occurred primarily because of increases in unscheduled maintenance.[6]

In the Air Force, several factors affect mission-capable rate, including the aircraft's mission, age, and the simplicity or complexity of its design. For some aircraft, the primary impact is continued use in supporting ongoing fighting in the Middle East.[7]

Getting left of problem

"The key to equipment or asset readiness," says Sam Gordy, general manager, IBM US Federal and Government Industries, "is to be *left of problem*. IBM is working with its clients to focus on problem *prevention*, versus problem *solving*. The military doesn't need to spend time, money and human resources on a problem they've prevented."

Increased and more accurate data helps the military *stay left of problem*—and remain in a constant state of readiness. The powerful combination of cognitive computing, analytics, the Internet of Things (IoT) and cloud makes this readiness possible, because data is accessible and tailored to stakeholders' unique needs.

Making repairs post-malfunction means downtime that the military can't afford.

Translating predictions into actions

The IoT is adding both muscle and significance to predictive analytics. A key IoT innovation is being able to make a forecast *actionable* to service members on the ground.

Concerning asset and equipment readiness, what maintenance technicians do with a warning is critical. Multiple stakeholders can impact readiness—if they have the right data at the right time, and the right approach to repairing or maintaining an asset.

IoT-fueled analytics can address how to act on a prediction, and the best way of doing so. It can make statistics applicable to many stakeholders, for example, providing the maintenance technician on the ground with an assessment of the maintenance action with the best chance of success. At the depot, it can be used to advise on which parts to order and increase the chance that parts are in stock. IoT analytics can also help program executive officers who manage the lifecycle understand issues, take advantage of warranties and act quickly on predictions.

Equipment readiness is a critical imperative

Military asset readiness speaks to more than the uptime, health and availability of equipment. A well-maintained, mission-capable asset saves money, time and lives.

For more information

To learn more about the readiness solutions utilizing cognitive technology, contact your IBM representative or IBM Business Partner, or see: ibm.com/industries/federal/national-security/readiness.

IBM Corporation
Route 100
Somers, NY 10589

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