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Rapid, Future-Ready IT Modernization in Defense Agencies

Transforming operations capability
and mission support with technology.

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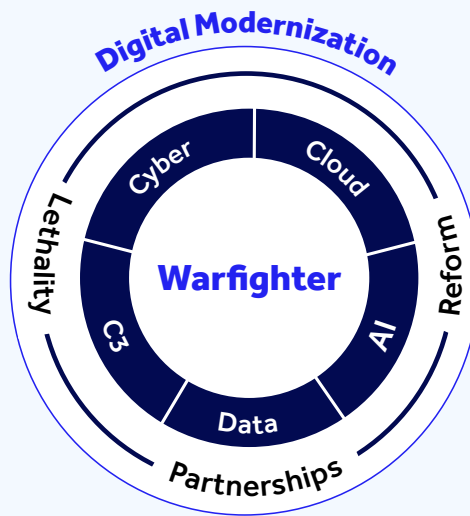
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The opportunity for a positive impact on the core mission.



The United States Department of Defense (DoD) and related agencies are driving an across-the-board IT modernization initiative. The [DoD Chief Information Officer's vision](#) is to create “a more secure, coordinated, seamless, transparent, and cost-effective IT architecture that transforms data into actionable information and ensures dependable mission execution in the face of a persistent cyber threat.” The US Army, for one, is leveraging their adoption of cloud, artificial intelligence (AI), and data analytics to form the IT backbone of their modernization initiatives across weapons, personnel, and strategy.

According to a [McKinsey](#) article on defense modernization among G7 nations, “one audit authority estimated the cost of systemic delays at 10% of the entire defense equipment budget. Clunky and bureaucratic acquisition processes, inaccurate initial cost or time estimates, and in-year budgetary pressures are all to blame. Typical procurement cycles for traditional weapons systems range from four to 30 years. Those for digital technology last around a year. Unless defense departments can radically change the way they acquire military equipment, they will simply be unable to keep up with the pace of technological change.”

Almost without exception, defense processes need to be revamped. To address issues, most departments add new processes, but older, redundant processes are never

discarded or reconfigured. All defense organizations need to make decisions rapidly, whether urgent or routine. Workflows are complex and unique—the processes for purchasing and equipping a nuclear submarine are very different from those needed to constantly supply food to a base or to upgrade office equipment or software. In order to be efficient, specific processes must be tailored to each defense agency and department.

There is a real opportunity to use up-to-date and actionable data—not just to make effective and strategic decisions, but to also drive down costs and delays. Analytics and AI/machine learning leverage data across silos to transform the way departments and their partner agencies, business stakeholders, warfighters, and civilians operate and interact. In addition, automating repeated and manual tasks enables warfighters, as well as civilians, to focus on higher priority and more value-added activities, leading to greater motivation among personnel and faster decision-making.

The DoD and its agencies are striving to transform their processes and systems to power flexible and rapid modernization, increase efficiencies with optimized operations, and build a foundational technology platform that can support their long-term needs.

The drive toward digitization and modernization.

In March 2021, US Secretary of Defense Lloyd Austin outlined his top priorities for the DoD, which included upgrading legacy IT systems and modernizing DoD technologies. “Where necessary, we will divest of legacy systems and programs that no longer meet our security needs, while investing smartly for the future,” Austin said. “In turn, we will improve the efficiency of the force and guarantee freedom of action in contested, complex operating environments.”

The DoD has multiple strategies to meet these priorities:

- **Enable automation and autonomy** to extend and complement human capabilities. Advantages include persistence, size, speed, maneuverability, and reduced risk to human life. The DoD targets seamless integration of diverse unmanned/mixed team capabilities that provide flexible options for the Joint Force.

- **Leverage AI** to enable US forces to operate more effectively and efficiently. This includes evaluating which processes and procedures can be enabled via adoption of AI technology to meet warfighter needs and defense priorities.
- **Move to enterprise cloud services** to provide scalable, flexible, and cross-domain capabilities to warfighters and civilians across joint forces.

The aim of all these strategies is to enhance and transform combat capability and mission support through IT modernization to enable DoD to conduct multi-domain operations (MDO) across an array of scenarios in multiple theaters.

To be successful, it is critical that these strategies are delivered by leveraging a trusted, credible technology with multiple successful implementations across departments and agencies behind it.



Defense technology challenges.

In the recent past, the US military was termed the most complex, bureaucratic, unwieldy organization in the world. Since then, a key priority for the military has been comprehensive IT modernization efforts. The organization focused on a new strategy to spur innovation by adopting cutting-edge technologies from the private sector and adapting them for military use. But there are many challenges facing the DoD and its agencies as they endeavor to deliver on their strategic IT modernization goals. Here are three of the most crucial:

Legacy systems – Legacy systems and platforms in DoD agencies are costly and ineffective, demanding more maintenance and upkeep and introducing more risk. The [National Defense Authorization Act for Fiscal Year 2022](#) includes a proposed mandate that would require each military service to initiate an effort to account for legacy IT systems, applications, and software. This is expected to remove redundant and unnecessary investments that can be retired or managed differently to free up funds that can be reinvested in other priorities.

Siloed data across multi-domain operations – The DoD hopes to leverage data as a strategic asset and transform into a data-centric enterprise. However, this is easier said

than done. Making data available across warfighting, intelligence, and business systems is essential to gaining an enterprise-wide view into the daily multi-domain operations of DoD, and absolutely critical to the success of both the 2022 National Defense Strategy and the 2019 Digital Modernization Strategy. Siloed data within DoD agencies must be unlocked and made easily shareable to improve readiness and overall mission success.

Cloud migrations – In 2018, DoD kicked off a plan to [migrate about 960 systems to the cloud](#) and shutter 60 data centers by the end of fiscal year 2021. Fourteen defense agencies and field activities are focused on cloud adoption and data center consolidation. According to DoD's [Information Technology Environment document](#), "The unnecessary complexity of this network and computing environment limits visibility and impedes the capability to securely share information and globally execute operations with mission partners. The current legacy environment offers too few enterprise and shared services. It is difficult to defend and costly to both operate and maintain."



The need for an adaptable, trusted platform.

The DoD and its agencies are in the process of implementing modernization initiatives. This transition requires operating with an application-driven approach. According to [Gartner's](#) "Top 10 Application Predictions Through 2025," how IT departments and organizations deliver services and modernize is changing. Adopting a value-driven, low-code, robotics/machine learning approach will make overcoming the challenges put forth by legacy systems, data silos, complex cloud and as-a-service journeys, and retiring knowledge workers and knowledge retention, more achievable. [Gartner](#) defines an enterprise low-code application platform as one that provides rapid application

development and deployment using low-code and no-code techniques such as declarative, model-driven application design and development together with the simplified one-button deployment of applications.

Over one million personnel are employed in key functional areas of the DoD. Of these functional areas, a workforce equivalent to 30 Pentagons is involved in supply chain and logistics, acquisition management, and human resources management. Here is a short list of core technology capabilities that will enable defense organizations to accelerate their IT modernization initiatives in these functional areas:

Acquisitions Management	Logistics Management	Workforce Management
<ul style="list-style-type: none">Contracting and program team collaboration across definition, review, and finalization of procurement requirements.Greater control and compliance through automation and machine learning for contract writing.Proactive management and tracking of funding, spending, and contract dates and automation for awards management.	<ul style="list-style-type: none">Automated defense logistics, asset data management, and cataloging with high data quality from flagpole to front line.Standardized processes for field resources and services management across the deployment lifecycle.Visibility into field activities and resolution status and real-time tracking of DoD fleet and assets.	<ul style="list-style-type: none">Automation across the DoD investigation life cycle with intelligent and integrated case management applications.Mobile CAC optimized across the enterprise with automated capturing, storing, and routing of all documents for recruiters.Onboard new war fighters, civilians, and contractors, securely post adjudication, with speed and efficiency.

What defense departments and agencies need is a flexible low-code platform on a single, comprehensive foundation to build the workflows and processes that best meet their requirements, without being tied to out-of-the-box, hard-coded process structures. "Data anywhere" should be a reality—that is, usable data should be accessible across sources without requiring movement of data. Workflows and applications should work on-prem, in the cloud, or in hybrid

environments that support the technology modernization, cloud migration journeys, and multi-domain operations. A platform approach that enables agencies to launch modernization initiatives with one or two processes and then grow the program across applications and organizations will also help them achieve mission objectives for efficiency and cost optimization.

Case Studies

Acquisition management | The US Air Force and CON-IT.

A screenshot of the CON-IT web application interface. The top navigation bar includes links for News, Tasks (13), Records, Reports, and Actions. The user is logged in as Jamie Harrell. The main heading is "Create Solicitation for Requirement: A003051". The form is divided into sections: "Basic Information" with fields for Title (CLEANING SERVICES), Substitution Method, Fiscal Year (2017), and Description (CLEANING SERVICES); "Issuing Information" with fields for Organization Name (Air Force), Contract Specialist (Jamie Harrell), Contracting Officer (Jamie Harrell), and Contract Specialist Email (jamie.harrell@us.af.mil). A sidebar on the left contains links for Summary, News, Related Actions, Tasks Report, Additional Information, Funding Information, Contract File, Enclosure Documents, Correspondence, and History.

[The US Air Force's Contracting-Information Technology \(CON-IT\) program](#) is a model example of successful digital transformation within the DoD. The enterprise-wide contract management system replaces seven disparate contract writing systems, unifying, standardizing, and integrating contract management across the entire US Air Force.

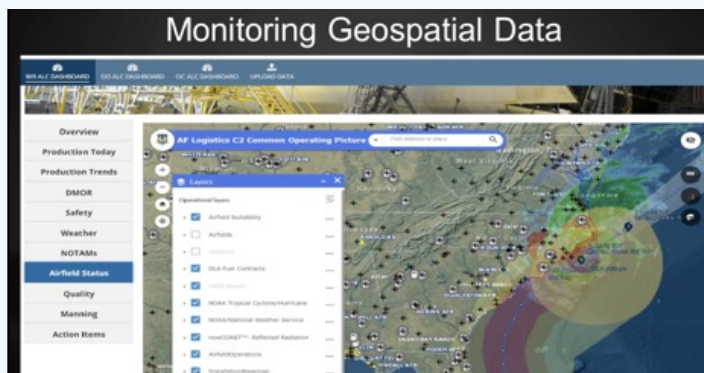
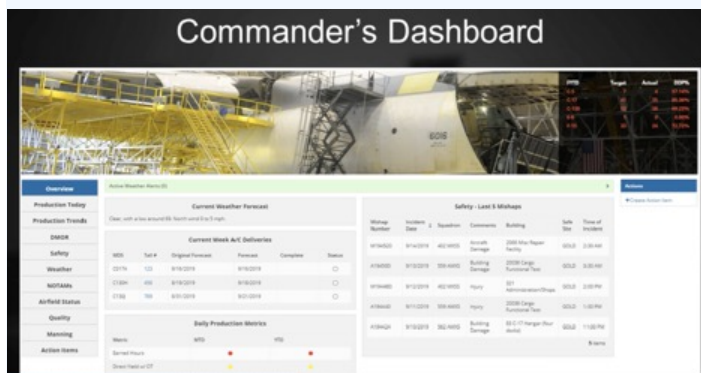
The CON-IT platform supports all contracting needs, including base operations, logistics, contingency, and weapons system contracting world-wide. The solution has been rolled out across the entire Air Force organization, being used by thousands of contracting professionals managing every contract in the Air Force in support of every Air Force mission.

According to Mike Allen, Program Manager responsible for this comprehensive initiative, "CON-IT is modernizing the contracting enterprise. CON-IT allows for audit transparency and is built on a modernized technical platform that resides in the cloud. CON-IT is faster and cheaper to maintain than legacy systems that are antiquated and have been mandated to retire. Our users are involved throughout development and deployment, and the feedback we've gotten so far has been exceptional."

The CON-IT solution expanded on a baseline from acquisition systems developed by the Defense Information Systems Agency (DISA). DISA's operationally proven contract writing solutions, leveraging an underlying low-code platform, automate the processes involved in offering, issuing, and managing a DoD contract. Successfully implementing modern contract management is not an easy task, unless the foundational platform is flexible and scalable enough to meet complex and stringent requirements. There have been specific examples within the DoD where multi-million dollar programs and initiatives have come to a halt because of a lack of agility and standardization.

CON-IT enables strategic sourcing and other acquisition efficiencies by normalizing data, business rules, and milestone tracking. Furthermore, CON-IT allows for a standardized and integrated method of anticipating, reacting, and responding to the current pace and changes in process, regulation, and technology across the contract domain.

Acquisitions management | The Robins Air Force Base HRT application.



The 402nd Software Maintenance Group (SMXG) at Robins Air Force Base (AFB) in Houston County, Georgia is a digital transformation leader. It has embraced market-leading low-code development tools and industry best practices to quickly and cost-effectively design, develop, and deploy applications that help accomplish its mission. The SMXG built its first low-code application, the [Hazard Reporting Tool \(HRT\)](#), and deployed it to 20,000 users in a single day. The HRT app resides on every AFB employee desktop. The application unifies data across legacy systems to give a complete dossier on each case for better decision-making. It captures every

action and document, providing a comprehensive audit trail. The HRT gives Air Force leadership visibility into potential hazards, case status, and staff response across the base.

And the HRT application was just the beginning—it was the first application in a rollout that leveraged the capabilities of an underlying low-code platform. Since then, SMXG has advised, developed, and deployed more than 40 applications on the same platform for project management, peer reviews, quality assurance, auditing, squadron dashboards, purchase approvals, and talent management.

Robins AFB was able to institutionalize and standardize processes, ensuring everyone is doing the same thing in the same way. This drives process improvement and efficiency and allows status reporting to be done at the click of a button across systems and data sources.

Robins Air Force Base is one of three US Air Force Air Logistic Complexes and manages a wide range of aircraft, engines, missiles, software, and avionics and accessories components.

Logistics management | The US Marine Corps TDM-CATALYST project.



The US Marine Corps (USMC) is the maritime land force service branch of the US military and is one of eight uniformed services in the United States. The USMC operates installations on land and aboard sea-going amphibious warfare ships around the world. Several of the Marines' tactical aviation squadrons, primarily Marine Fighter Attack squadrons, are also embedded in Navy carrier air wings and operate from the aircraft carriers.

The USMC launched a major logistics IT modernization effort called the [Technical Data Modernization \(TDM\)-Catalyst project](#). The USMC handles a great deal of mission-critical military material and equipment. This includes weapons, vehicles, radios, tools, and numerous other components, as well as subcomponents of equipment and supplies. Provisioning and cataloging are critical logistics support processes.

The TDM-Catalyst project focuses on the catalog of information needed to manage and administrate all of the above, including parts for repair and replacement.

These catalogs also hold information about the equipment configurations used by Marine Corps personnel, who provision parts and equipment for the warfighter. Multiple sources are used to acquire, sustain, and dispose of items that support the warfighter.

The original legacy life cycle process used one external and five separate internal IT systems to catalog and provision items. This led to massive inefficiencies, wasted man hours, and inaccurate data. To solve this, the USMC laid out the following product vision proof points, which drove its implementation:

1. Implement a cloud-based, low-code, rapid application development and data platform.
2. Use the platform to build an application for the acquisition logistics and product support community to streamline and largely automate the provisioning and cataloging processes, improve data quality and visibility, and transform the user experience.
3. Plan future projects to rapidly redesign and integrate logically grouped legacy system and application functions and design features to automate new, unsupported business process segments, fast.



The Marine Corps now uses a single, cloud-ready database for all acquisition logistics, one of the first applications on the Marine Corps Cloud environment. The new applications streamline user interaction, maximize automation, and drive robust validations that increase data quality across all USMC logistics processes. The efficiency of the system reduces time spent on cataloging and provisioning and empowers the Deputy Commandant for Installations and Logistics of the Marine Corps to accomplish their main goal more effectively: support the warfighter.

The cloud-based database is delivering the USMC enterprise Item Master capability to support configuration management and enhanced integration for the fleet's ground equipment, as well as to provide enterprise distribution of the Marine Corps' technical publications.

The Marine Corps realized many benefits as a result of this modernization. For example, in order to validate national stock numbers, users previously had to update 12 different systems, which took 6-8 months between catalogers and multiple agencies. There were frequent errors, out-of-date information, and duplicate orders. The new TDM-Catalyst system now completes this workflow in no more than 48 hours, and often in as few as 24 hours.

Global workforce management | The US Marine Corps MCRISS II platform.



Founded almost 225 years ago, the USMC employs approximately 200,000 active and reserve personnel. Recruiting is one of the core processes of the USMC. The Marine Corps needed to automate mundane processes to enable recruiting officers to focus on more high-value tasks. The [Marine Corps Recruiting Information Support System II](#), or MCRISS II, is a mobile platform that lets the USMC meet all of its recruiting needs from the first moment with an applicant to the time they leave boot camp.

Using a low-code application development technology to deliver greater process efficiency and provide recruiters additional time to focus on higher value tasks, the project office reengineered workflows and integrated siloed data. MCRISS II features a customizable platform where recruiters can tailor their dashboards to help them perform their daily tasks. They can also access the platform while offline in airplane mode when connections are unreliable. The application uses cloud technology and can be accessed using government-issued cell phones, laptops, and tablets.

MCRISS II is intended to completely remove paper from the processes and implement a totally new system without rehashing which processes were used before. The MCRISS II system is cloud-based, increasing its reliability, capability, and speed.

"The problem wasn't the big things, it was the small mundane tasks that were driving timelines, losing hours a week, repetitive things . . . [Our users] already see a vast improvement over the current system."

—Jason Glavich, MCRISS Program Manager

"The accumulation of saved time is really going to pay off. The small incremental changes in time can give time back to the recruiter so that they can spend time with their families or go recruit more."

—Christopher Mayfield, MCRISS Operations Officer

The system allows recruiters to create their daily, monthly, and annual plans and seamlessly manage across each of these without having to repeat the task or enter it in three separate areas.

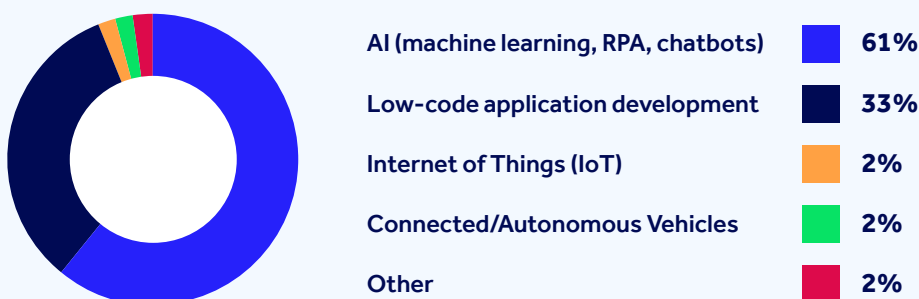
Choosing flexible, frictionless, future-proof technology.

The US Government Accountability Office ([GAO](#)) analyzed 65 federal legacy systems and identified the 10 most critical systems at 10 agencies, including the DoD. The systems were eight to 51 years old and, collectively, cost about \$337 million annually to operate and maintain. GAO also found that the DoD was one of only two departments to have a comprehensive modernization plan.

Technical innovation at the DoD is stifled by technical debt—

agencies are over-allocating resources toward maintaining and trying to modernize their existing legacy infrastructure. Complex, brittle, and inflexible legacy software needs to be replaced with new technologies that will help lower total cost of ownership of aging systems, unify siloed data, and build efficiencies with smarter, integrated, automated processes and business workflows across departments. Taking advantage of emerging technology for future conflict will help organizations maintain a strategic edge.

What emerging IT area will be most impactful in the next 3-5 years?



According to [Gartner](#), "By 2025, 70% of new applications developed by enterprises will use low-code or no-code technologies, up from less than 25% in 2020."

An industry-leading platform for defense agency modernization initiatives should have the following capabilities:

1. **Low-code.** Rapidly and effortlessly develop customized applications with minimal coding for current requirements and changes.
2. **Process mining.** Discover bottlenecks more easily in your workflows. Optimize them from a unified platform, reducing the number of steps and time from insight to action.
3. **Automation.** Machine learning and robotic process automation (RPA) bots orchestrate personnel, systems, and data in a single workflow, scaling across your entire organization.
4. **Application-as-a-service cloud-based models.** Enable cloud migrations to run on-prem, in the cloud, or in hybrid environments as you move along your cloud journey for multi-domain operations.
5. **Data anywhere.** Access your data wherever it resides and make it widely integrated and usable with flexibility and speed.
6. **Case management.** Jump-start your workflow modernization with acquisition management, logistics and asset management, global workforce management, and more.
7. **A trusted, future-proof system.** Start phased implementations and grow across agencies and domains to achieve longer-term modernization objectives.



Appian is the unified platform for change. We accelerate customers' businesses and organizations by discovering, designing, and automating their most important processes. The Appian Low-Code Platform combines the key capabilities needed to get work done faster, Process Mining + Workflow + Automation, in a unified low-code platform. Appian is open, enterprise-grade and trusted by industry leaders.

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