From Acquisitions to Force Generation

Software development in the DOD

by Mr. Matthew Teasdale

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The role of information in warfare is becoming essential, transformative, and all-encompassing. After spending time at the Air Force's premier software factory, Platform One, and collaborating with its Marine Corps counterpart, the U.S. Marine Corps Software Factory (MCSWF), I realized that the impact of information, particularly in software development, extends far beyond just ones and zeros. Both organizations seek to reshape the DOD but in different ways. Platform One promotes a philosophy called DevSecOps across the department and streamlines the acquisition process for greater agility and speed. In contrast, the Marines focus on cultivating digital literacy and nurturing technology-savvy personnel who develop defensive and offensive cyber capabilities for their commanders. Their combined efforts support the information-enhanced warfighter needed in an internationally contested environment.

Information and software already shape global military operations. In Ukraine, the Ministry of Defense routinely transforms the battlefield with new applications that enhance digital mapping and situational awareness for frontline troops. One such app, Delta, outlines frontline sectors, identifies friendly and enemy forces, tracks changes in the battlespace, and locates key objects. Users can pin UAV-made imagery, satellite pictures, and radar data, and share them with fellow service members on the battlefield.

Similarly, the Israeli Defense Forces developed Lavender, an AI-powered software designed to improve the targeting accuracy of Hamas militants. The program uses big data, gathering "visual information, cell phone data, social media connections, battlefield intelligence, [and] photos." Accompanying programs have also identified when Hamas fighters enter their homes, calculated the optimal timing for strikes, and assessed the likelihood of civilian casualties. Today's cyber-enabled capabilities encompass the modern battlefield, just as biplanes circled over the fields of Western Europe a hundred years ago.

As Ukraine and Israel leverage software to shape their respective conflicts, Platform One drives the U.S. military in a new direction to provide similarly advanced information-related capabilities.

Platform One's Deputy Materiel Leader, Duong Hang, told me that his organization's mission was "to help the DOD adopt DevSecOps." Mr. Hang explained that his goal was to change the culture of the DOD and did not necessarily include the implementation of technology. DevSecOps describes a philosophy that integrates three traditionally separate domains in development, security, and operations to ensure a secure, continuous software lifecycle from creation to deployment and maintenance. Maj Matthew Jordan, Platform One's Chief Product Officer, noted that Platform One's approach was not to become the DOD's sole platform as a service for application delivery and development; rather, they wanted to promote a standard of "continuous delivery of capability with confidence."

This mission is not just aspirational; during my time with Platform One, I observed their collaboration with software teams across the services to implement secure practices in software delivery. These included compliance checks with security controls from the National Institute of Standards and Technology, code integrity verifications to avoid duplications, and the cross-validation of the same code across various security applications. These efforts spanned diverse applications, from training to education services and satellite communications. Platform One actively supports more than 100 mission-critical applications, ranging from Mattermost, which enables airmen to coordinate food and medical air deliveries to Gaza, to high-end projects like the F-35 Joint Strike Fighter. I witnessed Platform One persistently work with other development and acquisition teams to supply a continuous integration and deployment pipeline for secure software.

The software factory's commitment to secure software practices directly supports the warfighter in an acquisitions race against global adversaries. While China's acquisition methods are state secrets, it is well known that many of its military systems are sourced from American companies by

exploiting dual-use technology. Recently, the People's Liberation Army repurposed Facebook's Llama, a large language model like ChatGPT, to conduct intelligence collection and analysis. Such instrumentalization places special strategic importance on secure development pipelines. Maj Jordan characterized his organization as an enterprise-service program office and described the programs he produces as either software as a weapon or software embedded into weapons systems. Since cyber warfare would likely form the opening gambit and lines of defense in global conflict, delivering secure software to clients across the DOD becomes part of a larger effort to encourage force protection and safeguard critical capabilities from adversaries.

In contrast, the Marine Corps Software Factory focuses on training Marines to become proficient in information technology and institutionalizing software development that delivers local, readily available capabilities. LtCol Charlie Bahk, the factory's executive director, is passionate about turning software development into a force multiplier.

When I spoke to LtCol Bahk, he explained why he fosters organic software development capabilities, rather than operate as a normal acquisitions office. He pointed out that the Marine Corps suffers 30 percent turnover every 3 years, and that commanders often find themselves short-handed on tech-savvy Marines. Though commanders rely on in-unit talent to solve problems and think creatively, LtCol Bahk lamented that the Marine Corps does not develop that talent. His objective is to develop a culture within his Service that invests in human capital to deliver tactically pertinent software. As opposed to Platform One, he stressed that the Marine Corps Software Factory develops solutions without the need for reach-back or time-consuming acquisitions contracts, which often outpace command tours that last 18 to 24 months.

During the first eighteen months, the lieutenant colonel's factory developed seven applications that quickly provide digital solutions, like automating human resources, as a first step in its mission to foster a culture of software innovation. The showcase success of these efforts is the MyCareer application. This application speeds up the manpower management's enlisted assignments branch by creating a smart queuing system that connects monitors and Marines. It allows Marines to prepopulate standard forms and receive text message notifications of scheduled appointments. Developed and deployed within six months, MyCareer facilitated more than 14,000 interviews and increased interview completion rates by over 80 percent. Compared to the branch's paper-based predecessor, the application has reduced missed appointments and long wait times, which previously burdened manpower management at events often attended by up to one thousand people. As the military faces a recruitment crisis, MyCareer helps retain the next generation of Marines and ensure a ready fighting force.

LtCol Bahk framed his organization's push for in-house software development in a similar vein to the leadership of Platform One—as a race against China. He pointed to the People's Liberation Army's Strategic Support Forces as a competitor that similarly developed proficiencies for information and software-related capabilities. Software is not just a tool for commanders but enables knowledge management, advanced analytics, and cognitive offload, such as with MyCareer. If young service members can organically create such software solutions, commanders can, in turn, hasten their OODA loops—a framework that streamlines decision making in competitive and dynamic situations. Investing in this next generation of Marines elevates the entire force, creating a ripple effect that benefits everyone. LtCol Bahk called Platform One the marathon runners of acquisitions, taking the strategic long-view perspective, while his team is focused on the sprint, developing and deploying software at the speed of operational relevance.

The information revolution is profoundly changing the character of war, and software has implications across nearly all military functions. Enhancing communications, encouraging innovation, and increasing lethality with digital solutions have positive first, second, and third-order effects that give American forces the upper hand. The evolving drone warfare-electronic jamming arms race in Ukraine, as well as Israel's explosive infiltration of Hezbollah's communications network, illustrate information's increasing importance. Global actors that trail behind the new digital reality are bound to struggle in modern conflict, like the French army that struggled to adopt the radio before World War II. Software development reflects another factor in an ongoing technological transformation that strategic planners and policymakers cannot ignore.

Along the same lines, software acquisitions and home-grown digital literacy form two complementary processes to prepare a military for such an information overhaul. Platform One's mission to transform the culture of program offices across the DOD represents transformative efforts in a cyber frontline that would bear the initial brunt of harm in the event of conflict. Yet, technology's entwinement with so many military functions outside of acquisitions and the pace of its development demand a digitally literate and innovative force structure. The Marine Corps Software Factory wants to institutionalize the knowledge and skills that provide middle to low-grade solutions for capability gaps that an acquisitions team cannot possibly deliver in time or within formal contracts.

Software development is critical to the U.S. military's mission of outpacing China, which is rapidly advancing toward its 2027 goal of "mechanization, informatization, and intelligentization" of the PLA. This includes the integration of AI into autonomous vehicles, intelligence systems, predictive logistics, electronic warfare, and other key capabilities. These developments present significant threats that will require robust counterprograms. The distinct approaches of Platform One and the Marine Corps Software Factory provide valuable lessons for the Armed Services as they advance into the Information Age.