WEAPON SYSTEM SUSTAINMENT

DOD Needs to Better Capture and Report Software Sustainment Costs

Why GAO Did This Study

Software is integral to the operation and functionality of DOD equipment, platforms, and weapon systems, including tactical and combat vehicles, aircraft, ships, submarines, and strategic missiles. DOD estimates that software sustainment funding will total at least $15 billion over the next 5 fiscal years. DOD carries out software sustainment at various locations, where DOD uses its maintenance capabilities to maintain, overhaul, and repair its military weapon systems.

GAO was asked to review several issues relating to the sustainment of operational system software for DOD weapon systems. This report examines, among other things, the extent to which (1) DOD has policies and organizations in place to manage the sustainment of operational system software for weapon systems; and (2) DOD and the military departments track costs to sustain weapon system software. GAO reviewed DOD policies and procedures and interviewed cognizant officials from select DOD software centers, among others, who perform weapon system software sustainment activities.

What GAO Recommends

GAO is making five recommendations, including that (1) the Navy categorize and report its software sustainment costs in accordance with DOD policy; and (2) CAPE improve the collection of weapon system software cost data. DOD concurred with GAO's recommendations.

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What GAO Found

The Department of Defense (DOD) has policies and organizations to manage the sustainment of operational system software. DOD policy defines software sustainment and software maintenance activities synonymously, to comprise any activities or actions that change the software baseline, as well as modifications or upgrades that add capability or functionality. One example of such an action is the Air Force's modifying the security software on the B-52 bomber to better protect against attempted system penetration. The figure below defines the four categories of software sustainment actions.

The Four Categories of Software Sustainment Actions

Corrective sustainment	Perfective sustainment	Adaptive sustainment	Preventive sustainment
Corrective sustainment activities diagnose and correct software errors after the software is released.	Perfective sustainment activities consist of upgrades to software to support new capabilities and functionality.	Adaptive sustainment activities modify software to interface with changing environments.	Preventive sustainment activities modify software to improve future maintainability or reliability.

Source: DOD Instruction 4151.20, Depot Maintenance Core Capabilities Determination Process (May 4, 2018); National Institute of Standards and Technology. | GAO-19-173

DOD policies on life-cycle management of weapon systems address software sustainment, and several DOD organizations—including DOD software centers—play key roles in overseeing and managing software sustainment. DOD policy includes software maintenance as part of core logistics, and it requires the military departments to report biennially to Congress on their estimated workloads to sustain core logistics capabilities, including estimated costs of these workloads. However, while the Army and Air Force categorize and report software sustainment as part of core logistics, the Navy does not. Without the Navy's categorizing and reporting its software sustainment costs, DOD and Congress are not fully informed of the magnitude and cost of core software sustainment capability requirements. This impedes DOD's efforts to plan for a ready and controlled source of technical competence, and to budget resources in peacetime while preserving necessary surge capabilities.

DOD's ability to track weapon system software sustainment costs is impeded by limitations in its collection of software cost data. First, GAO found that the Office of Cost Assessment and Program Evaluation's (CAPE) Cost and Software Data Reporting system did not collect weapon system cost data from DOD software centers. Recognizing this, CAPE directed in January 2017 that cost and software data efforts on major acquisition programs should begin to be collected from government organizations, including DOD software centers. However, CAPE acknowledges that it lacks an implementation plan to execute and monitor the requirement for these centers to submit cost and software data. Second, GAO also found that the military departments' operating and support cost systems have incomplete software sustainment cost data. DOD policy requires the military departments to collect and maintain actual operating and support costs, including software sustainment costs. Without CAPE's taking steps to prioritize obtaining complete information on operating and support costs for software sustainment, CAPE is challenged in its ability to accurately compile total program costs or provide reliable life-cycle cost estimates to DOD and Congress.

_____ **United States Government Accountability Office**