

Advanced Collaborative Environment: Enabling the Future Force Unit of Action

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The Future Combat Systems (FCS) program will deliver a Future Force Unit of Action (UA) to the Army by the end of this decade. To accomplish this expansive task, the Army requires a life-cycle management system to support the FCS program. The life-cycle management system must act as a force multiplier and as a catalyst to accelerate product development. It must also support the FCS UA throughout its entire life cycle. The Advanced Collaborative Environment (ACE) is the force multiplier for the FCS program.

FCS ACE represents a new way of doing business within the Army acquisition community by streamlining the process of multiplatform weapon systems acquisition. Using ACE will dramatically shorten the FCS system development and demonstration phase as decision makers will have modeling and simulation, design, engineering and test data available to them before production lines ever start rolling. In addition, by applying tenets of the Army's Simulation and Modeling for Acquisition, Requirements and Training initiative, FCS ACE will provide data support to engineers who are developing realistic synthetic battlefields. These battlefields are complete with complex terrain and intelligent opposing forces, enabling Soldiers to fight tomorrow's battles today on "digital dirt." By using FCS ACE, issues will be addressed, mistakes avoided and effectiveness maximized as key participants will collaborate early and often on authoritative sources of digital product information.

Evolution

ACE evolved from the DoD Directive 5000-mandated integrated data environment (IDE) for sharing information and tracking program management data and product life-cycle data. The U.S. Army Tank-automotive and Armaments Command and National Automotive Center originally developed the ACE concept and today the Tank Automotive Research, Development and Engineering Center is involved as well. FCS ACE meets the IDE mandate and significantly surpasses the requirements for an IDE with particular enhancements for digital product data management of system-of-systems (SoS) product development and support for modeling and simulation throughout the weapon systems development life cycle.

Boeing and Science Applications International Corp., the Army's Lead Systems Integrator (LSI) for the FCS program, are delivering the ACE as an

FUTURE COMBAT SYSTEMS
FCS
One Team-The Army/Defense/Industry

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FCS PROGRAM VISION: "ONE TEAM - EQUIPPING OUR JOINT WA

Future Combat Systems

Advanced Collaborative Environment

PROGRAM INFO | LSI HOMES | GOV'T IPT HOMES

ACE HEADLINE

To report a problem, please call the Boeing Enterprise Help Desk.

Within the Puget Sound region, call (425)234-0911.
Outside the Puget Sound region, call (866)469-0911.

When you call in, take option 2 (for computing software) and then take option 4 in FCS ACE problem.

WHAT'S NEW

Posted	Title
06/08/2003	9 FCS Customer/Supplier Relationship Building
10/27/2003	Authorized Contacts With Suppliers
10/27/2003	Contract Work Authorizations Available on Contracts F
10/27/2003	Discussions and Directions of Suppliers (DAID)
09/09/2003	FCS OrgRAA 09082003
11/13/2003	FCS Organizational Announcement 5
11/17/2003	FCS Organizational Announcement 6
11/04/2003	FCS Program Acronym List is now Available
11/14/2003	Gov't Co-Leads: Please Read Regarding CORL Workflow
09/29/2003	New FCS Promotional Items Website
08/25/2003	One Team Council Kickoff Briefing
09/05/2003	Sept 4 All Hands Presentation

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PROGRAM OPERATIONS AND INTEGRATION COMMUNICATIONS

Posted	Title
11/19/2003	FCS Program-level Daily, Weekly & Long Range Event

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FCS enterprise-wide, integrated information management gateway. The LSI Statement of Work (SOW) mentions FCS ACE 33 times and states that it will be used for generation and delivery of all FCS Contract Data Requirements Lists. The SOW clearly defines the capabilities that FCS ACE will deliver to the FCS program when

it states: "... the FCS ACE to serve as the primary means of creating, sharing, reporting, collecting, recording, accessing and approving program information ...". It also makes FCS ACE the single integrated source of FCS data, stating: "... single integrated source of management information, product information and

technical data ...". The SOW designates FCS ACE as the FCS program management support tool: "ACE shall be developed to serve as the primary FCS program management decision support system." The capabilities mentioned above only sample the ACE capabilities the LSI will deliver to the Army.



At its core, FCS ACE is an Internet-based, Web-centric and federated data environment for accessing, sharing, collaborating, integrating and controlling management information as well as product information and technical data defining the FCS Future Force UA. The FCS ACE home page is shown in the figure on Pages 28-29. FCS ACE consists of an integrated suite of "best-of-breed" commercial-off-the-shelf (COTS) applications. These COTS applications can be grouped into five major modules.

COTS Applications

The first module, called Program Management, provides robust tools for collaborative management of the FCS program. Here, the FCS management team can use a management tracking application to control, measure and report on program action items as well as monitor the technical performance of the FCS program. Risks are managed within the risk management tool and the management team can track FCS cost, schedule and performance through the earned value management system. All of the tools are accessible to the FCS management team 24 hours a day, 7 days a week via the Internet.

The second module, called Project Collaboration, provides users the capability to collaborate on a specific task or element, develop or review the task and then complete the task. This capability allows users to develop and share "in-work data and files" while allowing individual project managers to manage data access within the project. The Project Collaboration module has a variety of features to facilitate collaboration including discussion forums, Microsoft Project® integration, subscription, notification, action-item assignment and tracking, data iteration management and document routing.

The third module, called the Distributed Product Description (DPD), ties together UA product data. This will include requirements, specifications, modeling and simulation, design, production, test data of all FCS platforms, the network and all UA support elements. The DPD will allow collaboration and data sharing with 21 prime contracts and their associated subcontractors; 130 Army complementary programs spanning across 12 program executive offices and 44 program management offices; and various Army organizations such as Army Test and Evaluation Command facilities, research development and engineering centers and battle labs. The DPD will be the single authoritative source of FCS SoS performance data.

The DPD has various Web-centric views, known as DPD lattices, and will provide automated integration processes between suppliers, Army data environments and the FCS ACE. The DPD will allow users to access all relevant FCS data no matter where it physically resides through a single Web-centric entry point within the FCS ACE. Configuration management remains under the control of the group developing the data and pointers will be created to the data within the FCS ACE. DPD references will automatically be updated whenever changes are made to the data. Simultaneously, version control and change history will be maintained.

The fourth module, called Workflow,

provides the ability to automate business processes. The Workflow module allows users to configure routings and make decisions on the fly about where an object should go next.

The Workflow module will also eliminate time-consuming, manual, paper-based configuration management processes. Workflows involving the DPD are key to enabling continued integration of maturing technologies as systems progress through block upgrades.

The fifth module, called Visualization, provides users the ability to view lightweight, computer-aided design (CAD) data without having a CAD system (e.g., Pro/ENGINEER® or CATIA®) installed on their workstation. This very powerful tool greatly expands the number of users who can see 3-D models of UA

platforms while they are still in development. It will also allow multiple users to collaborate in real time on design drawings over the Internet and make design changes from distributed locations. Users can mark up models and save those markups into FCS ACE where the changes can be reviewed by others and used in the configuration management process.

FCS ACE Impact

Once FCS weapons systems are in production and fielded, the impact of FCS ACE will be far-reaching. FCS ACE will support reach-back training by allowing soldiers to receive and apply new tactics and techniques. Reach-back logistics will allow soldiers sustaining FCS platforms to receive updates on repair parts and maintenance

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procedures. FCS ACE will provide configuration data about each platform and maintain configuration information throughout the platform's life. This allows the logistics community to generate Interactive Electronic Technical Manuals (IETM) using FCS ACE. As changes are made to FCS platforms in the field, the onboard IETM database will be updated via the FCS reach-back capability.

FCS ACE continues to mature and expand in capability and user base. Today the FCS ACE has more than:

- 3,700 users
- 600 projects
- 1,400 active workflows
- 200 gigabytes of data

FCS ACE provides the backbone of collaboration for the Army, industry and

the joint community working together to produce the FCS Future Force UA. The Army has designated FCS ACE as the prototype architecture for Increment I implementation of the Army ACE because it has made such a significant investment in, and seen so much benefit from, FCS ACE. FCS ACE has already made a dramatic impact on the FCS program and will continue to be a critical tool enabling the FCS program to achieve its aggressive timelines and, more importantly, deliver enhanced combat capability to the Soldier.

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Sustainability: An Essential Combat Capability

Nancy A. Moulton



“The FCS Family-of-Systems (FoS) must maximize available combat power while achieving significant logistics footprint reductions and personnel efficiencies in the area of operations (AO) through reduced demand for maintenance and supply.” This is the overarching key performance parameter (KPP) for sustainment, as documented in the Future Combat Systems (FCS) Operational Requirements Document (ORD) KPP #5.

The FCS approach to providing sustainment is summarized in the following paragraphs by discussing the four main focus areas for accomplishment that must be addressed during the system development and demonstration (SDD) phase:

- Supportability assessments
- Design for supportability

- Design the support
- Support the design

Supportability Assessments

To meet ORD requirements, three high-level assessment measures are being developed to evaluate operational effectiveness: operational availability, reduced logistics footprint, and lower

life-cycle costs for the unit of action (UA). These metrics are supported by many other ORD requirements such as high reliability, increased fuel efficiency, onboard water generation, self-loading and cross-leveling of supplies under armor and a predictive logistics and medical capability. The Program Manager (PM) FCS is using the recently published DOD guide titled