THE ACCS SOFTWARE LOG

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THE ACCS COMMON SOFTWARE PROGRAM

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VERSION 01.00.00

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RANDY KORICH

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This document accompanies a videotape of the same presentation recorded live at the Software Productivity Consortium in August 1993. It is recommended that the videotape be viewed with these viewgraphs at hand.

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SPC Building
2214 Rock Hill Road
Herndon, Virginia 22070
In this video, Mr. Korich describes the current organization of the overall ACCS Program. He also discusses the common architecture and other technical considerations supporting reuse, and lessons learned both organizationally and technically. Mr. Korich describes how the ACCS Program will support significant planned software reuse in the development of multiple command and control systems for the Army. Many of these issues are being worked in the Consortium’s Reuse Maturity Division.
THE
ARMY COMMAND AND CONTROL SYSTEM
COMMON SOFTWARE PROGRAM

Software Productivity Consortium

26 August 1993

POC:
Product Manager, Common Software
ATTN: Mr. Randy Korich
SFAE–CC–CHS–CS
Albert J. Myer Center
Fort Monmouth, NJ 07703–5402
ACCS COMMON SOFTWARE PROGRAM

OUTLINE

ACCS Common SW Architecture
Management Structure
Documentation
CASS Components
Common Applications
Lessons Learned
Summary
ACCS COMMON SOFTWARE PROGRAM

A major software reuse initiative that consists of two projects:
- Common ACCS Support Software (CASS)
- Common Applications (CA)
ESTABLISHED FOUR-LAYER ARCHITECTURE
FOR COMMON SOFTWARE

STANDARDIZATION
- Structure
- Code Dev. Procedures
- Reuse Guidelines
- Module Interactions

BENEFITS
- Reduce Development Costs
- Increase HW Independence
- Facilitate Expansion
- Improve Interoperability
- Reduce Sustainment Costs
- Provide Operational Flexibility
- Allow Wider Industry Participation
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MANAGEMENT STRUCTURE

EXECUTIVE COMMITTEE

PM CHS
PM CS

- Module Development
- Integration

INTEGRATION CONTRACT W/GE

PM's

- Module Development

- DEP PEO CCS CHAIRS PERSONALLY
- MANDATORY PM MEMBERSHIP
- MODULE DEVELOPMENT DECISIONS HAVE BEEN FINALIZED

PRODUCT MANAGER - COMMON SOFTWARE
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DOCUMENTATION

VERY DIFFICULT TO OBTAIN AGREEMENT!!

SYSTEM/SEGMENT SPEC (SSS) - 22Jul92
CASS Requirements

ARCH DESCRIPTION & OOP CONCEPT (ADOC) - 5Feb92
Reuse Concepts OOA Methodology

SYSTEM/SEGMENT DESIGN DOCUMENT (SSDD) - 5Jun92
Top Level Architecture Interfaces Testing Scenarios

ACCS S/W STAND & PRAC MAN (SSPM) - 3Mar92
Software Standards and Guidelines

INTER-SOFTWARE COMM (ISC) RMSTS - 5Nov91
Comm Services Rqmts

PROD MGMT PLAN (PMP) - 18Jan93
CS Management Structure Roles & Responsibilities CS Major Activities
CASS SUBLAYER 1 FUNCTIONALITY

BASIC COMM SERVICES
Supports the transparent communication between software units across the network.

COMMUNICATIONS
Supports communications between systems on a LAN or WAN.

DBMS SERVICES
Performs database distribution and replication.

O/S SERVICES
Interfaces C2 application to the UNIX operating system.

DISPLAY SERVICES
Provides lower level objects for controlling the interactive display using X-Windows/Motif.

CASS Sublayer 1 provides the interface to COTS S/W and H/W.
CASS Sublayer 2 Functionality

**Alert**
Captures, queues, processes, and displays audio/visual alerts.

**Map**
Generates, displays, and updates map data.

**Message**
Supports all ACSS required message formats. Provides services for message receipt, interpretation, routing, and formulation.

**Network Mgmt**
Manages and configures network-related parameters.

**Workstation Mgmt**
Manages and controls workstation functions including the configuration parameters.

CASS Sublayer 2 provides the support SW interface to applications.
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CASS ISSUE

- **OBJECTIVE:** Provide functionality required by the SSS, in an architecture consistent with the ADOC and SSDD; and maintain all block interfaces under Configuration Management

- **PROBLEM:** PEO CCS programs have made a significant investment in development of software that may meet CASS functional requirements but not the architecture

- **SOLUTION:** Two-phased approach
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SOLUTION

- The Team visited each BFA in order to facilitate the implementation of CASS based on the following goals:
  - Determine the suitability of current BFA software implementations for inclusion in near-term CASS
  - Identify specific differences between current BFA implementation architectures and CASS architecture as defined in the 14Feb92 System/Segment Design Document (SSDD)
  - Evaluate BFAs design for modularity and overall system engineering design approach
  - Recommend best candidates for CASS blocks.
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SOLUTION (Continued)

- Integrate existing software IAW the ADOC and SSDD blocks
- Block developers provide CASS Programmer's Manuals IAW the SSPM
- Maintain Ada specs under PM CS configuration management and coordinate changes
- Update the SSDD to reflect changes in the models
- Scrub the SSS
- Grow functionality to meet the SSS requirements
- Coordinate a phased, incremental implementation corresponding to prioritized requirements
- Establish Technical Advisory Groups as required
- Utilize BFA's documentation to maximum extent possible
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PM CS INTEGRATION ACTIVITIES

- COORDINATE INTERFACES BETWEEN COMMON S/W PROVIDERS
- EVOLVE INTERFACES TO OPTIMIZE COMMON S/W USEABILITY
- INTEGRATE PRODUCTS FROM DIFFERENT COMMON S/W DEVELOPERS
- PERFORM INDEPENDENT ACCS THREAD TESTS TO VALIDATE IMPLEMENTATION OF DIFFERENT USERS' REQUIREMENTS
- PROVIDE PRIMARY INTERFACE BETWEEN COMMON SOFTWARE USER AND DEVELOPMENT COMMUNITIES
COMMON APPLICATIONS

The real pay-off for PEO CCS!!
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COMMON APPS OVERVIEW

PURPOSE: APPLICATION SOFTWARE MODULES THAT PROVIDE FUNCTIONALITY TO MEET TODAY'S C2 REQUIREMENTS

KEY CHARACTERISTICS:

- STAND–ALONE AND/OR INTEGRATED MODULES
- BASED ON ACCS LAYERED ARCHITECTURE
- UTILIZE SERVICES PROVIDED BY CASS
- FOCUS ON HIGH PAY–OFF AREAS
- CONCENTRATE ON APPLICATIONS AND NOT SUPPORT SOFTWARE

DEVELOPMENT HAS BEGUN!

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CA BEING DEVELOPED

COMMON APPLICATIONS

Terrain Evaluation Module
- MITRE

Movement Control Module
- CM/SEI

Briefing System Generator
- CSSCS
- MMC

OPLAN/OPORD Module
- MMC

PRODUCT MANAGER - COMMON SOFTWARE
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PROGRAMMATIC LESSONS LEARNED

• Provide strong management leadership

• Assign a strong independent project manager
  – Exercise independent project control
  – Incorporate user input
  – Feedback to all user levels

• Use the right people

• Focus on technical issues

• Obtain budgetary and programmatic support from the top of the organization and independent from the users

• Schedule the development of reusable assets before the users are under significant pressure from their development schedules
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TECHNICAL LESSONS LEARNED

- Focus on technical issues instead of budget budgetary and programmatic issues
- Work by consensus
- Develop the requirements documents from scratch in working groups with technical representatives of all major users/developers
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REUSE LESSONS LEARNED

- Recognize schedule risk when depending on planned products from other developers
- Rigorous product evaluations essential
  - Eliminate immature products
  - Reduce integration risks
  - Ensure key evaluation criteria met
- Require access to a technical staff to answer questions about a candidate product
- The extent and quality of the documentation of products to be ported has a significant impact on the cost of each release
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SUMMARY

- PROVIDES THE INFRASTRUCTURE AND FOCUSES FUTURE DEVELOPMENT EFFORTS ON APPLICATIONS
- FACILITATES ACCESS PORTING TO LCU AND CHS-2 PLATFORMS
- IMPROVES INTEROPERABILITY WITHIN ACCESS AND JOINT COMMUNITY
- SOFTWARE & DOCUMENTATION AVAILABLE TO SUPPORT BFA RECOMPETE EFFORTS
- REDUCES SOFTWARE TECHNICAL RISK
- SUPPORTS DoD REUSE INITIATIVES BY BEING PROCESS DRIVEN AND ARCHITECTURE CENTRIC
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SUMMARY

- Common Software requires commitment from total organization, must be top down driven
- Must be willing to pay upfront costs to save money in long term
- Requires formal documentation (SSS, ADOC, SSDD, etc.) to implement. Difficult process to get agreement from multiple PMs and contractors
- Process must permit trade-offs and central decisions when required
- Common Software will increase opportunities for industry to provide “stand-alone” modules
Questions or comments on content should be directed to:

Randy Korich, Product Manager
Common Software
SFAE-CC-CHS-CS
Albert J. Myer Center
Fort Monmouth, NJ 07703-5402
(908) 544-4678

Or to:

Rich McCabe
Software Productivity Consortium
2214 Rock Hill Road
Herndon, VA 22070
(703) 742-7185

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Technology Transfer Clearinghouse
Software Productivity Consortium
2214 Rock Hill Road
Herndon, VA 22070
(703) 742-7211