Capability-based Architecture Development and Integration Environment (CADIE) Tutorial

DoD Enterprise Architecture Conference
11 April 2011
Agenda and Outline

- CADIE Executive Overview
- Tour of CADIE Capabilities:
  - Single Sign-on, User Authentications, and Role Based Permissions
  - Website Orienteering
  - The Architecture Catalog
  - Reporting and Visualization of Structured Architecture Data
  - The Data Warehousing Concept
  - Managing Authoritative Reference Data
  - Linking Architecture with Army Force Management
- Question and Answer Session
Purpose, Problem Addressed, and Solution

- **Purpose:** Describe what the Army CADIE is and its value to the Army

- **Problem Addressed:**
  - No single authoritative source for Army architecture data and information that is both trusted and consistent across the Army’s executive architects (TRADOC, ASA(ALT), CIO-G6, OBT)
  
  - Architectures are built in “stovepipe” applications that are not connected, can be found, understood, used, reused, and follow a common set of standards

- **Solution:**
  - A common operating environment for the architecture community to collaborate, develop, discover/share/reuse, integrate, and manage architectures to support decision making with authoritative, trusted data....that common environment is an Army CADIE
What CADIE Provides

- **Access to authoritative data for analysis and decision making:**
  - Ability to go to a single place on the Army LandWarNet to find trusted, managed, and protected architecture data and information
  - Ability to use architecture data and information in a way that makes sense to a non-architect
  - Ability to tailor reports and visuals of the data to meet a stakeholders purpose in support of their specific process (e.g. JCIDS, NSWG, Force Management, etc.)

- **Saves the Army money:**
  - Reduces redundancy across the Army architecture community (TRADOC, ASA(ALT), PEO/PMs, CIO G-6, OBT, CERDEC) and creates efficiencies
  - Enables integrated architecture data to be used for cost based analysis and trade decisions
CADIE OV-1: Basic Concept

CADIE is an Army asset that is not a single system or tool rather it’s a collection of systems synchronized to achieve a set of outcomes in support of stakeholder requirements.
CADIE CV-2: Hierarchy of Capabilities

- Reporting & Decision Support
- Configuration, Workflow and Analysis
- Operational and System Visualization
- Data Integration, Federation & Storage
- Data Extraction, Transformation, Loading (ETL)
CADIE CV-6: Required Capabilities to Activities

Reporting & Decision Support
- Manage Enterprise Architecture Report
- Support Enterprise Architecture Decision
- Manage Enterprise Architecture Workflow
  - Design Navigation
  - Develop Navigation
  - Manage Navigation
  - Review Architectural Artifact
  - Approve Architecture Artifact
  - Administer Architectural Workforce

Configuration, Workflow and Analysis
- Govern Enterprise Architecture Process
- Perform Architectural Analysis
  - Identify Architecture Alternatives
  - Analyze Alternative Architecture
  - Analyze for Development Requirement
  - Simulate Enterprise Architecture

Operational and System Visualization
- Develop Enterprise Architecture
  - Develop Operational Architecture
  - Develop System Architecture
  - Develop Open-System Architecture
  - Develop Information Architecture
  - Develop Technical Architecture

Data Integration, Federation & Storage
- Federate Architecture
- Integrate Architecture
  - Store Architecture
  - Load Data
  - Transform Data
  - Extract Data
  - Manage Data Relations
  - Validate Data
  - Stage Data
  - Publish Data

Data Extraction, Transformation, Loading (ETL)
- Extract Data
- Model Data
- Parse Data
- Map Data
- Convert Data

Legend
- Capability
- Activity
Tour of CADIE
CADIE Data Warehousing Concept
Data Warehouse Three-tiered Approach

- Expand current three-tier data warehouse with enhancement of:
  - **Staging & Integration Area** to support optimal ETL
  - **Data Marts** to support OV, SV, TV, reference
  - **Business Intelligence** for Analysis and Data Mining Tools

One of the industry best practices describes a 3-tier data warehouse as the most efficient structure for top-down business intelligence.
CADIE Data Warehouse Design

CADIE Three-Tier Data Warehouse Contextual Model

Source Systems & Data
- Structured Data
- Modeling Tool(s)
- Unstructured Data
- Collaboration Tool(s)

Staging Area
- Data Mgmt Tool(s)
- Data Interface

Data Warehouse
- Data Storage
- Reference Database
- Data Marts

Business Intel
- Analysis Tool(s)
- Data Mining Tool(s)

End User Tools
- Reporting Tool(s)

Internal/External Producer

Internal/External Consumer
Staging & Integration Area is a location where data can be extracted, integrated & transformed to load to the enterprise data store.

- Maximize EA tool integration through staging
- Leverage current vendor implemented mappings
- Enable one data model for connection to data warehouse
- Support multiple tools and let vendor staging tool handle complexities of keeping up with EA tool outputs

Staging & Integration area enables operational data storage to minimally impact data warehouse.
Data Warehouse Staging & Integration Area

Significant enhancement to enable data steward functionality in standardizing
A data mart is a subject specific data storage area optimized to enable reporting and analysis.

- Optimize speed and efficiency of access to users
- Reduce network traffic
- Security and restricted access
- Users can retain ownership of federated data
- Flexibility in creating or changing Data Marts w/o affecting data warehouse

Industry best practice describes data marts as the way for optimal efficiency.
Data Warehouse *Data Marts*

- Multiple Marts supporting Federated Community
- Marts Connect to BI or Direct
- PEO/PM System Data Marts
- HQDA-G6 Technical Mart(s)
- TRADOC Operational Data Marts
- Metadata Repository
- SQL Server Database
- Reference Database
- Distributed Ownership and/or Cost
- Data Bridge

Net-centric data sharing environment
Business intelligence is a broad category that covers data mining and analysis tools

- **Analytics** for informed decisions
- Use models to drive predictions of a possible future state as **predictive analytics**
- **Benchmark** against defined standard “Reference Models”
- Enable user to **mine data** in multiple dimensions:
  - **social network analysis** (recognized communities within large groups of people);
  - **locality analysis** (grouping similar functions within a geographic locality);
  - **hierarchical clustering** (structured analysis for solution level or enterprise level architectures) and many others.

Business intelligence enables informed decisions through structured analysis.
Data Warehouse BI and Data Mining

“Fit-for-Purpose” querying, reporting and visualization

Supporting analytics, benchmarking, and/or predictive analytics

Business Intel

Analysis Tool(s)

Data Bridge

Data Mining Tool(s)

Direct Interface for Data Mining the DW

End User Tools

Swim Lane Generator

Util/Vis Visualization

Sand Table 3-d

CADIE Reporting

Marts Connect to BI or Direct

Operational View Mart

Reference Data Mart

US Army TRADOC, ARCIC, AIMD

UNCLASSIFIED
Back to Tour of CADIE
Questions?
BACK-UP
CADIE’s Net-Centric Value Chain

Required Capabilities
- Operational
- Systems
- Organizational
- Network
- Environment
- Scenarios
- TIME FRAME

Flexible Execution
- Continuous Decision Making
- Continuous Knowledge Building
- Continuous interaction with other actors (information sources and decision makers)

Knowledge

Information

Decisions

Individuals

Data

Data

Data

Data

• Networking
• Integration
• Post/Retrieve
• Interoperability

• Knowledge Building
• Visualization
• Knowledge Assistants (Architects/SMEs)
• Discovery Services
• Visibility of and Access to Information

• Skilled Architects
• Functional SMEs

• Decision Assistants
• COA Analysis Assistants
• Architecture Models
• Architecture SMEs