



**Enterprise Architecture – an ITLC Update**  
**09.12.2006**

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# Agenda

- ◆ Why an Enterprise Architecture in AdCom?
- ◆ Technical Reference Architecture
- ◆ Our EA Repository
- ◆ Current Architecture Initiatives
- ◆ Web Services/SOA in AdCom Today
- ◆ Realized Value
- ◆ Q&A



# Why an Enterprise Architecture?

- ◆ Strategic **information repository**
  - ◆ Define current and target architecture environments
  - ◆ Plan change and impact
- ◆ **Life cycle management**, governance
  - ◆ Control proliferation and retirement of technology
  - ◆ How many databases engines do we own? Where are they used?
- ◆ Application and data **security** for HIPAA, PCI, and California Privacy compliance - NASA
- ◆ Extraction of “**Common Requirements**” across projects into patterns of reusable tested components and eventually business processes



# What did we do?

- ◆ Created a Technical Reference Architecture (2002)
  - ◆ maintain technology lifecycle and architectural control
- ◆ Adopted Zachman Enterprise Architecture Framework
  - ◆ powerful thinking and organization tool
  - ◆ logical – not J2EE, .Net, Portal, or WebServices
- ◆ Typically, organizations store redundant lists of “stuff” in Word, Excel, Visio...
  - ◆ application lists, critical business cycles...



# What did we do, continued

- ◆ Adopted Stanford's Protégé Knowledgebase & Ontology Tool
  - ◆ Created a taxonomy model that answer specific questions
  - ◆ Minimizes redundancy, increases consistency of information
- ◆ Populated the Model
  - ◆ Protégé auto-generates forms for capturing information
  - ◆ Forms based on our ontology and class definitions
  - ◆ Cross-link important facts (Projects to Technologies, etc) for slicing
- ◆ Documented SDLC and a change management process



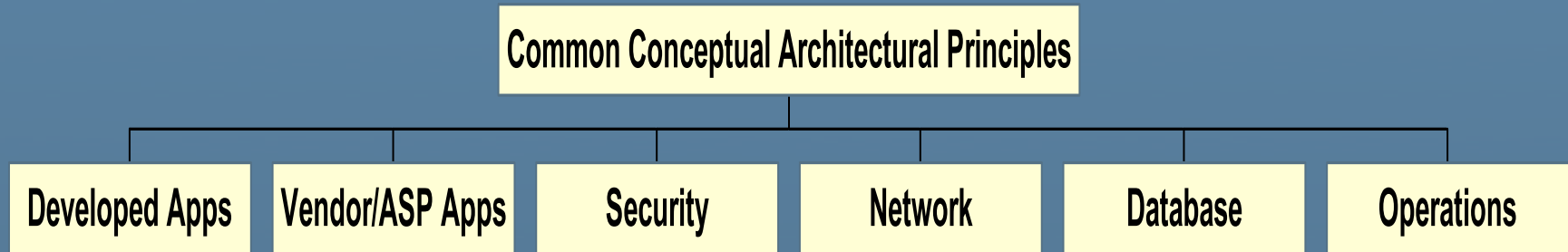
# Our Governance

- ◆ Technical Reference Architecture
  - ◆ quarterly review by Application Architect, Infrastructure Architect, Security Architect, Enterprise Architect
  - ◆ used by campus community
- ◆ Protégé Strategic EA Information Repository
  - ◆ quarterly review by management in AdCom
- ◆ EA Infrastructure Planning
  - ◆ monthly meetings - EA Technical Team and Project Leaders agree on common requirements and define reusable components
- ◆ Working on more formal and broader governance methods



# Technical Reference Architecture

- ◆ Documented principles, guidelines, and best practices of Architecture Domains:



- ◆ Lifecycle Management

- ◆ Adopt the “4 year/16 Quarter Sliding Window Methodology”
- ◆ Identifies technologies that are “**Approved**”, “**Maintained but not Upgraded**”, in “**Sunset**”, “**Retired**”, or “**By Approval Only**”.



## Product/Technology Life Cycle Matrix

This is a sliding 16 quarter window in Calendar years. The date range of the Calendar year is January 1 through December 31 and corresponds to industry conventions.

Legend:

Key	Meaning
W	Watch - This product has been placed on a watch list of technologies to follow. It has not been approved for use.
R	Research - Product should be used only for pre-approved, proof-of-concept projects. Technology may be under evaluation.
P	Pilot - Technology approved for small-scale production use only.
I	Invest - Technology recommended for wide-spread deployment.
C	Invest with Caution - Although this technology is regularly maintained and upgraded, it should be used only when alternative technologies are not feasible. Technology can only be used by exception, after review and approval by Administrative Computing Services Architectural Steering Committee.
M	Maintain - New implementations are not encouraged. Existing systems may continue to rely upon these components and extend existing implementations. Product may be maintained but not planned for upgrades except bug fixes.
D	Disinvest - Technology is in the process of being phased out.
O	Obsoleted - Vendor or industry support is gone. Tool should no longer be used.
V	Vetoed - Investigated and found not to meet organization's needs - rejected.

## Database/File Storage Systems

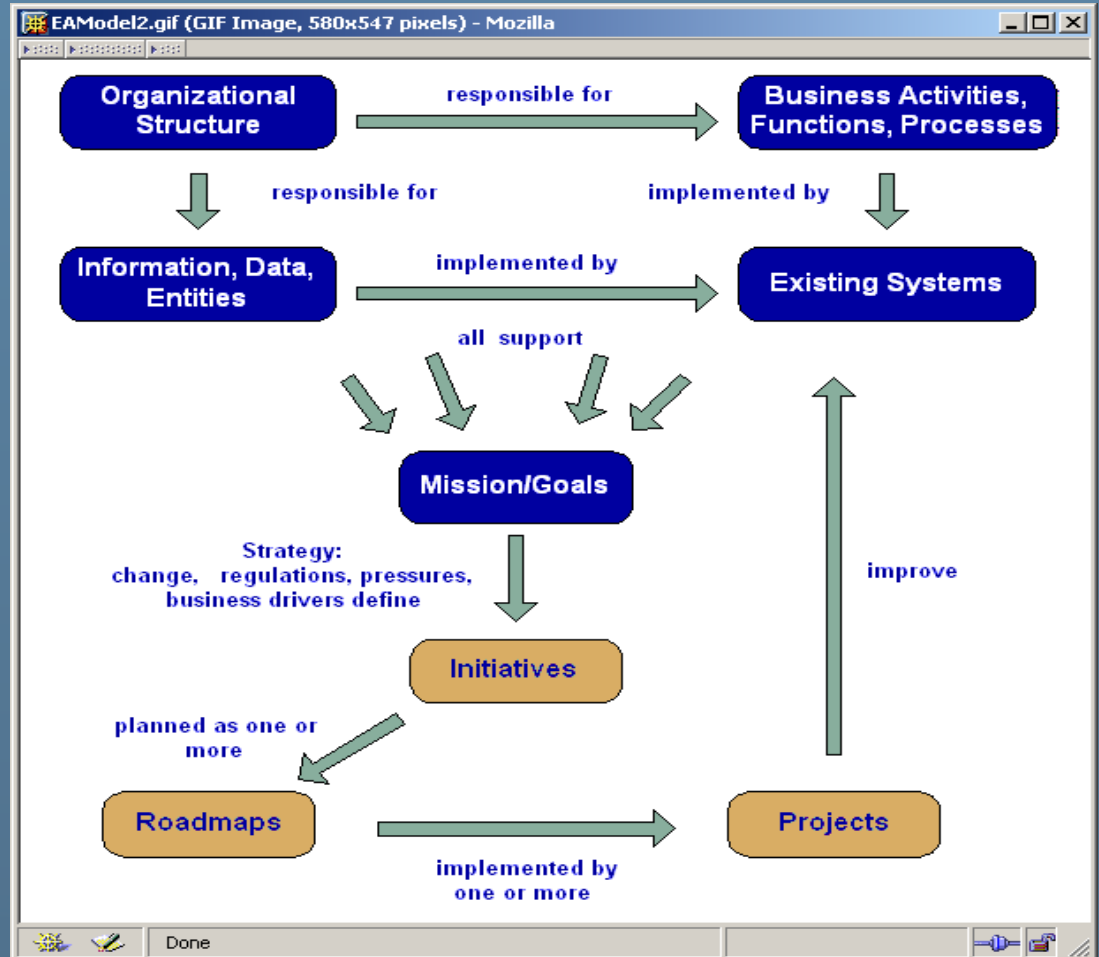
Tool/Technology	Platform	Usage/Type	2006				2007				2008				2009			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
DB2	Mainframe	EDB/PPS, WebPAN	M	M	M	M	M	M	M	M	M	M	M	M	D	D	D	D
DB2	Intel, Solaris	UC RFP resulted in preference for DB2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
VSAM	Mainframe	FS, DRS and PAL	M	M	M	M	M	M	M	M	M	M	M	M	D	D	D	D
Sybase 12.x	Solaris	DWH, SBS, Depreciation, TRA, EQS, StateClaim, SAMS, PBS, SNAP, CyberPay, CostSharing, HR FastClass, HR QuickTemp, HR Unemployment Ins., ServiceDesk	M	M	M	M	M	M	M	M	C	C	C	C	C	C	C	C
MS SQL Server 2000	Windows	Approval needed for HIPAA, PCI, or SB1386 personal data. GreenTree, QuickRec, SBS Student Bill Query, Facilities Apps, Parking, CTES Timesheet	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
MS SQL Server 2005	Windows	Approval needed for HIPAA, PCI, or SB1386 personal data.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
MySQL	Solaris, Linux, Windows	Open source RDBMS. Used for DotProject, WebPAN Archive, DWH Ledger. Approval needed for HIPAA, PCI, or SB1386 personal data.	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
PostgreSQL	Solaris, Linux, Windows	Open source RDBMS.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
SAP DB	Solaris, Linux, Windows	Open source RDBMS.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Oracle	Solaris, Linux, Windows	Due to limited staff resources and training, this database is currently not an option unless a vendor product absolutely requires it.	D	D	D	D	W	W	W	W	W	W	W	W	W	W	W	W
LDAP/Berkeley DB	Solaris, Linux, Windows	Used by openLDAP and SunOne LDAP	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C





# Our EA Repository

- ◆ model uses Zachman EA Framework concepts
- ◆ stores strategic information – a subset of the Technical Reference Architecture
- ◆ goals articulated
- ◆ initiatives, roadmaps, projects linked to goals
- ◆ technology linked
- ◆ change strategy
- ◆ communication tool





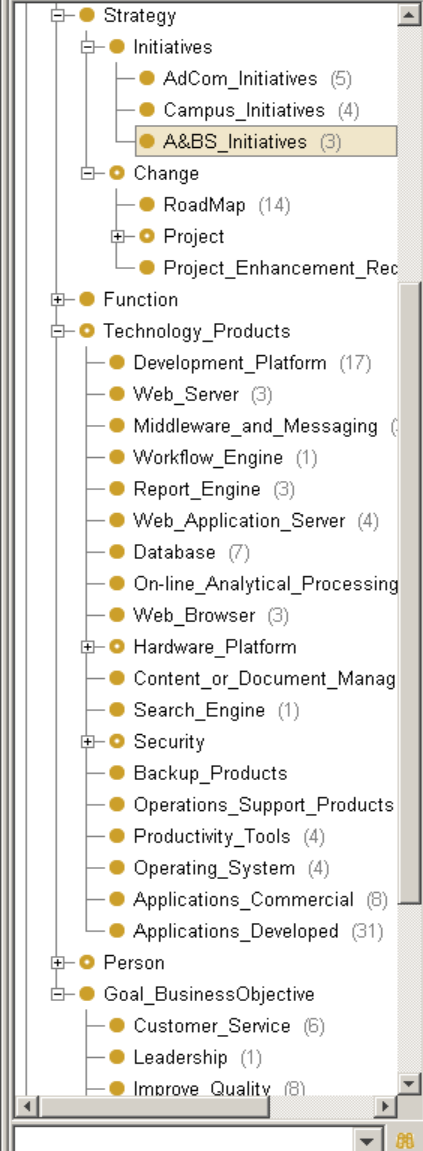
Navigation icons: New, Open, Save, Print, Copy, Paste, Undo, Redo, Find, etc.

● Classes    ■ Slots    ■ Forms    ◆ Instances    ▲ Queries

### CLASS BROWSER

For Project: ● EnterpriseArchitecture\_V6

#### Class Hierarchy



### INSTANCE BROWSER

For Class: ● A&BS\_Initiatives

#### initiative\_name

- ◆ A&BS Enterprise Architecture Initiative
- ◆ Deliver meaningful business reports to facult
- ◆ Modernize and Web-enable core Financial a

Types

- A&BS\_Initiatives

### INSTANCE EDITOR

For Instance: ◆ Modernize and Web-enable core Financial and Purchasing Systems (instance of A...

#### Initiative Name

Modernize and Web-enable core Financial and Purchasing

#### Initiative Description

Modernizing and Web enabling the Financial and Purchasing Systems and making them accessible from SNAP, the campus business portal, is one of the most important changes that campus users have asked for. Additionally, for a number of years, AdCom has been interested in moving from the IBM platform to a more cost effective, flexible, and less complex technology. Of concern is that the demographics of the labor force makes it difficult to recruit IT professionals with knowledge

#### Roadmaps for Initiative

- ◆ Quali System Migration Roadmap
- ◆ Web Farm Implementation Roadmap
- ◆ Decommission of the IBM Mainframe
- ◆ Mobius Replacement
- ◆ EDB/PPS Migration to UCOP
- ◆ Campus Administrative Portal Roadmap

#### Realizes Goal

- ◆ Leverage Open Source solutions
- ◆ Minimize IT skill sets
- ◆ Optimize return on investment
- ◆ Reduce training
- ◆ Improve IT agility and flexibility
- ◆ Real-time information and transactions
- ◆ Improve IT agility and flexibility
- ◆ Improved access to accurate, timely information
- ◆ Promote single application development environment
- ◆ Reduces manual processing time and errors
- ◆ Single access point for users

#### Scope

#### Comment

# Instance: Modernize and Web-enable core Financial and Purchasing Systems

Instance of Class: A&BS\_Initiatives

Attributes		
Name	Value	Type
roadmap_or_project_for_initiative	<ol style="list-style-type: none"> <li>1. <a href="#">Kuali System Migration Roadmap</a> ( <input type="radio"/> RoadMap)</li> <li>2. <a href="#">Web Farm Implementation Roadmap</a> ( <input type="radio"/> RoadMap)</li> <li>3. <a href="#">Decommission of the IBM Mainframe</a> ( <input type="radio"/> Active_Projects)</li> <li>4. <a href="#">Mobius Replacement</a> ( <input type="radio"/> Active_Projects)</li> <li>5. <a href="#">EDB/PPS Migration to UCOP</a> ( <input type="radio"/> Active_Projects)</li> <li>6. <a href="#">Campus Administrative Portal Roadmap</a> ( <input type="radio"/> RoadMap)</li> <li>7. <a href="#">UCI Data Warehouse</a> ( <input type="radio"/> RoadMap)</li> </ol>	Instance
initiative_name	Modernize and Web-enable core Financial and Purchasing Systems	String
scope		String
comment		String
initiative_description	<p>Modernizing and Web enabling the Financial and Purchasing Systems and making them accessible from SNAP, the campus business portal, is one of the most important changes that campus users have asked for. Additionally, for a number of years, AdCom has been interested in moving from the IBM platform to a more cost effective, flexible, and less complex technology. Of concern is that the demographics of the labor force makes it difficult to recruit IT professionals with knowledge of the complex IBM environment. The modern IT workforce is trained on and has greater interest in more modern technologies such as Web, Java, and .Net. Once the core financial, payroll and purchasing applications are migrated to non-IBM platforms, the IBM is too expensive to maintain.</p>	String
realizes_goal	<ol style="list-style-type: none"> <li>1. <a href="#">Leverage Open Source solutions</a> ( <input type="radio"/> Reduce_Cost_of_IT_Operations)</li> <li>2. <a href="#">Minimize IT skill sets</a> ( <input type="radio"/> Reduce_Cost_of_IT_Operations)</li> <li>3. <a href="#">Optimize return on investment</a> ( <input type="radio"/> Reduce_Cost_of_IT_Operations)</li> <li>4. <a href="#">Reduce training</a> ( <input type="radio"/> Reduce_Cost_of_IT_Operations)</li> <li>5. <a href="#">Improve IT agility and flexibility</a> ( <input type="radio"/> Improve_Productivity)</li> </ol>	Instance

## Instance: **HR Fast Class Reclassification System**

Instance of Class: **Applications\_Developed**

Attributes		
Name	Value	Type
life_window		Instance
project_request	<a href="#">HR Reclassification/Classification System</a> ( <b>Project_Enhancement_Request</b> )	Instance
development_technology	<ol style="list-style-type: none"> <li><a href="#">Java Expresso - Application Development Framework</a> ( <b>Development_Platform</b> )</li> <li><a href="#">HTML/JavaScript/CSS</a> ( <b>Development_Platform</b> )</li> <li><a href="#">WebAuth Campus Authentication</a> ( <b>Authentication</b> )</li> <li><a href="#">Expresso Security Access Control</a> ( <b>Authorization and User Group Role Mgmt</b> )</li> <li><a href="#">SAMS Security Access Maintenance System</a> ( <b>Authorization and User Group Role Mgmt</b> )</li> <li><a href="#">Drala Workflow Engine</a> ( <b>Workflow_Engine</b> )</li> <li><a href="#">Java Jasper Report Engine</a> ( <b>Report_Engine</b> )</li> <li><a href="#">Sybase RDBMS</a> ( <b>Database</b> )</li> <li><a href="#">Mozilla Web Browser</a> ( <b>Web_Browser</b> )</li> <li><a href="#">Netscape Web Browser</a> ( <b>Web_Browser</b> )</li> <li><a href="#">emie.adcom.uci.edu Solaris Platform</a> ( <b>Solaris_Server</b> )</li> <li><a href="#">helios.adcom.uci.edu Solaris Platform</a> ( <b>Solaris_Server</b> )</li> <li><a href="#">IE Web Browser</a> ( <b>Web_Browser</b> )</li> </ol>	Instance
technology_life_state	UseAndInvest	Symbol
version		Instance
project_status	InProductionMaintenance	Symbol
URL	<a href="http://apps.adcom.uci.edu/expresso">http://apps.adcom.uci.edu/expresso</a>	String
project_using_technology	<a href="#">HR Classification/Reclassification Streamlining</a> ( <b>Completed_Projects</b> )	Instance
disaster_recovery_level		Symbol
technology_name	HR Fast Class Reclassification System	String
cycle_important_for_project		Instance
sponsoring_party	<a href="#">Human Resources</a> ( <b>Stakeholder</b> )	Instance
supporting_party	<ol style="list-style-type: none"> <li><a href="#">Ying Kussmann</a> ( <b>Employees</b> )</li> <li><a href="#">Katie Sedelny</a> ( <b>Employees</b> )</li> </ol>	Instance



# Current Architecture Initiatives

- ◆ Windows VMWare Virtualization Server Infrastructure 3
- ◆ LDAP
  - ◆ group/role membership, attributes
- ◆ SunOne Java Messaging Service (JMS)
  - ◆ for Publish/Subscribe, asynchronous and event-driven messaging
- ◆ Web Farm Implementation
  - ◆ Load Balancers (2 - Sun N1400)
  - ◆ Solaris SAN
  - ◆ LDAP, JMS, and Web application redundancy and clustering
  - ◆ Scalability, flexibility, reliability - 24/7 uptime
- ◆ Apache/SunOne UDDI and Web Services
  - ◆ HTTP/SOAP for Request-Reply, JMS for Event-driven services

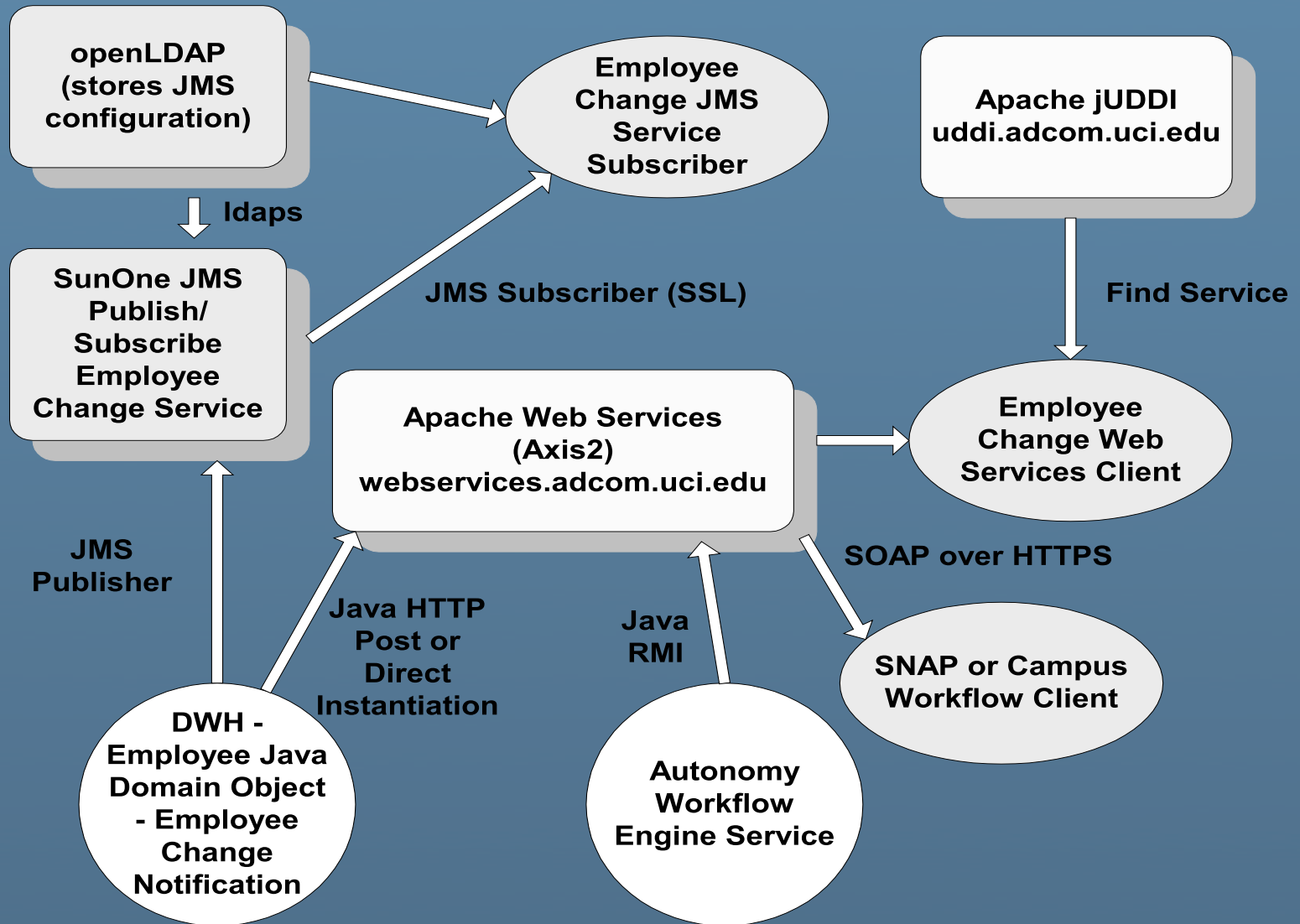


# Web Services in AdCom

- ◆ Data Warehouse
- ◆ Tririga Facilities Management System
  - ◆ Web Services/SOAP to update building, people, org data.
  - ◆ WSDL for integration (authentication, query, update)
- ◆ Web Services implemented and published to UDDI
  - ◆ getWorkflowTasks
  - ◆ getSeparatedEmployeeList
    - ◆ uses both HTTP and JMS Publish/Subscribe Protocols
    - ◆ reuses Data Warehouse “Employee” Java business objects
  - ◆ Full Accounting Unit Validation Web Service



# Web Services, UDDI, JMS





# Realized Value

- ◆ Technologies retired or consolidated
  - ◆ database and windows servers consolidated
  - ◆ reduced Admin and DBA costs
  - ◆ CICS and Foxpro retirement in progress
- ◆ Applications are Java focused and database neutral (JDBC)
- ◆ Reduced development costs
  - ◆ tested code reuse (business process/SOA reuse is future challenge)
  - ◆ reuse of staff skill sets
  - ◆ common infrastructure for development that is platform independent





# Benefits

- ◆ Comprehensive approach to enterprise strategic planning that encompasses business, technology, data and logical modeling.
- ◆ Management decisions based on more accurate and timely information.
- ◆ A strategic road map for change with careful project selection, sequencing, and planning and technology management.

**“Projects done without architecture planning cost significantly more in the long term” (John Zachman)**



- ◆ UC Irvine's EA Web Site: [apps.adcom.uci.edu/EnterpriseArch](http://apps.adcom.uci.edu/EnterpriseArch)
- ◆ Zachman Framework: [www.zifa.com/](http://www.zifa.com/)
- ◆ Sloan School of Management's "Matrix of Change": [ccs.mit.edu/MoC](http://ccs.mit.edu/MoC)
- ◆ Ontology and Knowledgebase: [protege.stanford.edu/](http://protege.stanford.edu/)
- ◆ UC Irvine's Administrative Portal: [snap.uci.edu](http://snap.uci.edu) uses JA-SIG uPortal software: [www.ja-sig.org/](http://www.ja-sig.org/)
- ◆ jUDDI, Web Services and XML/XSLT: [www.apache.org](http://www.apache.org)
- ◆ Java Application Dev. Framework, CMS: [www.jcorporate.com/](http://www.jcorporate.com/)
- ◆ LDAP: [www.openldap.org/](http://www.openldap.org/)

