# Lessons Learned in Applying Architecture to Acquisition

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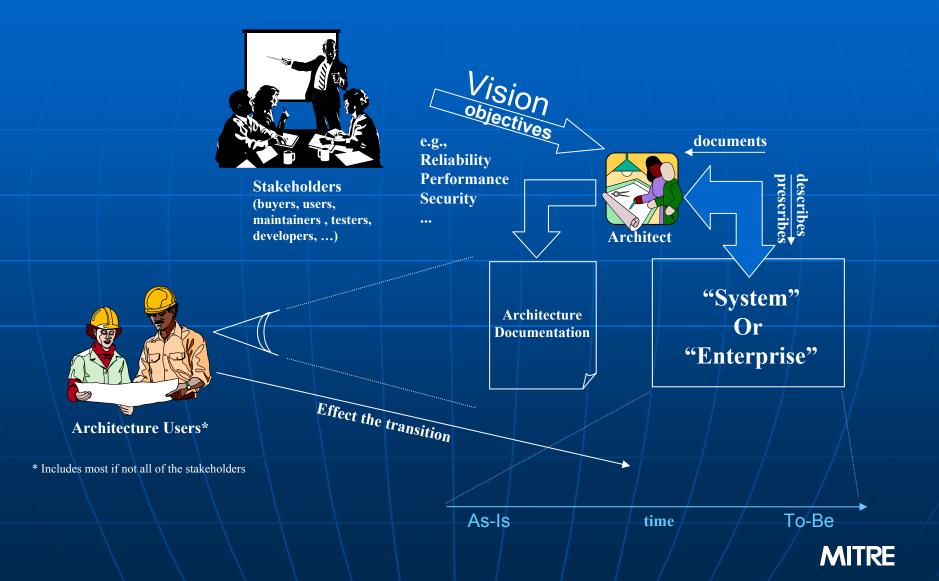


 Conducted an in-depth look at three USAF Electronic Systems Center (ESC) programs and their use of architecture in acquisition
Various approaches to use of architecture
Primary areas of interest
Representing requirements

- Driving system design
- Supporting Enterprise Integration



### Architecture's Role in Acquisition



## **Program A Characteristics**

#### Program Scope

- Migration of legacy systems to networkcentric, enterprise-based system
- Sustainment of legacy systems until decommissioned

#### Architecture Development

- Government developed Operational Views (OVs) and Technical Views (TVs)
- Contractor developed System Views (SVs)
- Program Status
  - Initial increment operational



### **Program B Characteristics**

### Program Scope

 Migration of legacy system to common infrastructure to provide distributed, network-centric capability

### Architecture Development

 Contractor and Government developed OVs/SVs

### Program Status

Initial increment in test



## **Program C Characteristics**

#### Program Scope

- Development of new capability
- Multiple contractors led by Integration contractor

#### Architecture Development

- Focus on common architecture data
  - Aligned to multiple "driving" architectures
  - Contractor/Government architecture products developed to support systems engineering analyses

#### Program Status

In requirement clarification phase



Architecture as a Means to Represent Requirements

#### What worked

- Useful as communication vehicle between user, acquirer and developer
- Used in source selection process
- Supports business process reengineering
- Issues
  - Maintaining architecture-requirements traceability
    - Size of requirements databases has led to difficulties in mapping requirements to architecture



## Architecture as a Means to Drive System Design

### What worked

- Used as basis of discussion at major program reviews
- Identification of common Use Cases

### Issues

- Architecture usage not incorporated into existing contractor processes
- Have not yet achieved automated architecture to design traceability



## Architecture as a Means to Support Enterprise Integration

- What worked
  - Identifying common technical principles
- Issues
  - Evolving Enterprise Architectures concurrently with Enterprise Integration processes
    - Role of architecture not well understood
    - Need to determine right level of data abstraction
  - Enterprise Architectures evolving concurrently with Program Architectures
    - Enterprise guidance/direction may result in potential cost/schedule impacts to programs



## **General Observations**

- Shift in culture/process still evolving
  - Architecture not incorporated into existing processes
  - Configuration management of multiple, related architectures is needed
- Methodology standardization is not imminent
  - Both Object Oriented and Structured Analysis methodologies have their advantages and proponents
- Tool standardization is not a panacea
  - Same tool doesn't ensure traceability
  - Required tool may not fit contractor's development processes
- Focus on architecture data is more important than a particular methodology or tool
  - More data is not necessarily better
  - Some level of abstraction is needed to conduct meaningful analyses
- DoD Architecture Framework (DoDAF) does not yet adequately address:
  - Net-centric representations
  - Performance representation

