Integrating TOGAF, Zachman and DoDAF Into A Common Process

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Customer Success Is Our Mission
Topics

• Definitions
• Building Blocks of an Architecture Process
• Unifying the Standards
• Summary
Definitions

• Architecture
  – “The fundamental organization of a system embodied in its components, their relationships to each other and to the environment, and the principles guiding its design and evolution.” (IEEE 1471-2000)

• Architecture Framework
  – A resource that guides the development or description of an architecture

• Business Architecture
  – A perspective of the overall architecture reflecting enterprise mission, strategies, goals, business drivers, business processes, information flows, and the supporting organizational structure

• Technical Architecture
  – Perspectives of the overall architecture reflecting the enterprise’s data, applications and technical components

• Enterprise Architecture
  – A blueprint (set of models) that depicts how various business and technical elements work together as a whole

• Enterprise
  – “e” : the highest level of a system or system of systems
  – “E” : a Department or Agency of the government
Piecing The Puzzle Together: What’s Needed In An “Architecting Process”?

- Architecting Method
- Architectural Products
- Product Formats
- Architecture Validation
- Collaboration
Building Blocks

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The Open Group Architecture Framework (TOGAF)
Version 8.0
Enterprise Edition
Architecture Development Method (ADM)
Building Blocks (cont’d)

- Architecting Method
- Architectural Products
- Product Formats
- Architecture Validation
- Collaboration

The Department of Defense Architecture Framework (DoDAF) Final Draft Version 1.0
Building Blocks (cont’d)

- Architecting Method
- Architectural Products
  - Supplementing the DoDAF
- Product Formats
- Architecture Validation
- Collaboration

The Zachman Framework For Enterprise Architecture
Building Blocks (cont’d)

- Architecting Method
- Architectural Products
- Product Formats
- Architecture Validation
- Collaboration

- DoDADF Templates
- Unified Modeling Language (UML)
- Integrated Computer-Aided Manufacturing (ICAM) DEFinition (IDEF)
Building Blocks (cont’d)

- Architecting Method
- Architectural Products
- Product Formats
- Architecture Validation
- Collaboration

- Software Engineering Institute’s Architecture Tradeoff Analysis Method℠
- Quality Attribute Assessment Techniques (e.g., Colored Petri Nets)
Building Blocks (cont’d)

- Architecting Method
- Architectural Products
- Product Formats
- Architecture Validation
- Collaboration
REAP: A Unification of Standards

- Raytheon Enterprise Architecture Process (REAP)
  - I Enterprise Understanding
  - II Architecture Planning
  - III Business Architecting
  - IV Technical Architecting
  - V Architecture Validation
Activity I: Enterprise Understanding

• Goals
  – Set context for architecture and architecting activities
  – Common understanding with customer on the [E/e]nterprise, the architecting initiative, and the problem space

• TOGAF Relationship
  – ADM: Phase A

• Subprocesses
  – Customer-focused architecting
  – Requirements analysis
  – Operational/Business analysis
  – Quality attribute analysis

• Inputs
  – Customer vision, needs, & requirements documents
  – Domain expertise
  – Industry & government standards

• Outputs
  – DoDAF AV-1, Overview & Summary Information
  – DoDAF AV-2, Integrated Data Dictionary
  – DoDAF OV-1, High Level Operational Concept Graphic
  – DoDAF TV-1, Technical Standards Profile
Activity II: Architecture Planning

• Goal
  – Establish a plan for the upcoming architecture activities, the goals of the architecture and the architectural outputs

• TOGAF Relationship
  – ADM: Preliminary Phase

• Inputs
  – Customer vision, needs, & requirements documents
  – DoDAF AV-1, AV-2, OV-1, TV-1
  – Quality attribute-based requirements

• Outputs
  – Architecture principles
  – Architecture schedule
  – Enhanced DoDAF AV-1, Overview & Summary Information
  – Architecture engineering environment

• Subprocesses
  – Identify stakeholders
  – Define architecture principles
  – Identify architectural products, formats and the supporting Zachman cells
  – Define product relationships / dependencies
  – Define schedule
  – Select tool(s)
  – Plan concordance, configuration & consolidation of architectural products
  – Form/train Architecture Team
Activity III: Business Architecting

- **Goal**
  - Model the customer’s view
- **TOGAF Relationship**
  - ADM: Phase B

- **Subprocesses**
  - Collect Zachman Framework “primitives” for Row 2
    - Produce mapping matrices as needed
  - Model Business/Mission Scenarios

- **Inputs**
  - Customer vision, needs, & requirements documents
  - Domain expertise
  - Architecture principles
  - DoDAF AV-1, AV-2, OV-1
  - Architecture engineering environment

- **Outputs**
  - Business/Mission Scenarios within DoDAF OV-5, *Operational Activity Model*
  - Catalogued information from Zachman Framework Row 2 Cells
Activity IV: Technical Architecting

• Goal
  – Produce the remaining architectural descriptions of the enterprise from a variety of views

• TOGAF Relationship
  – ADM: Phases C, D

• Subprocesses
  – Develop/mature the defined DoDAF view products
  – Develop the defined additional architectural products
  – Ensure concordance between architectural products
  – Iteratively evolve an executable model

• Inputs
  – Business Architecture
  – Customer vision, needs, & requirements documents
  – Domain expertise
  – Architecture principles
  – DoDAF AV-1, AV-2, OV-1, OV-5, TV-1 (and its referenced standards)

• Outputs
  – Architecture Baseline Package
  – Executable model
Activity V: Architecture Validation

• Goal
  – Ensure the architecture is ready to be implemented

• Subprocesses
  – Architecture checklist
  – ATAM<sup>SM</sup>
  – Quality attribute assessments

• Inputs
  – Architecture Baseline Package
  – Executable model

• Outputs
  – Completed architecture checklist
  – Simulation results
  – SEI’s Architecture Tradeoff Analysis Method<sup>SM</sup> results
  – Validated architecture
Other Analysis Efforts

- Enterprise Architecting Tools
- Object Management Group’s Model-Driven Architecture
- UML 2.0 for Systems Engineering
- OMB’s Federal Enterprise Architecture Reference Models
- CMMI and IEEE-1471 Mappings
- Standardized supplemental views
- Agile Modeling
- Open Systems Architectures
- Certification Programs
Summary

• There are established industry and government standards to help us address enterprise-wide architectural alignment between customer mission, strategic goals, business rules, data, application systems, organization, and technology.

• No one standard or framework addresses all the aspects of the architecting process. Unification is necessary to complete the picture.
Questions?

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Reference Links

• The Open Group Architecture Framework, Version 8.0
• C4ISR Architecture Framework, Version 2.0
• Department of Defense Architecture Framework, Version 1.0
• Zachman Framework for Enterprise Architecture
  – http://www.zifa.com
  – http://www.zachmaninternational.com
• Software Engineering Institute’s Architecture Evaluations
  – http://www.sei.cmu.edu/ata/ata_eval.html