Working Towards ‘Lightweight’ Enterprise Architectures: the Process, frameworks, standards, and models

Theuerkorn’s “Lightweight Enterprise Architectures” Chs 2-4, US Federal Standards, examples and more
Domains of Architecture

(Theuerkorn, 2005, p. 26)
Architectural foci

- **Information Architecture**
  - focuses on the human interactions with the systems throughout the enterprise…not limited to the employees of the organization, but including customers, business partners, and external systems.
  - The key view of the information architect is the processes and flows of these assets' interactions with the enterprise.

- **Application Architecture**
  - is the domain of the electronic bits of an organization's assets that primarily focuses on the software supporting the systems.
  - However, this does not include all software, such as operating systems that are integral to the domain of Technical Architecture, but rather the applications with which users are more likely to interact and that provide the functionality to support key processes as identified by the Information Architects.
  - The Application Architects receive input from the Information Architects on the required functionality and collaborate on the usability of the applications.

- **Technical architecture**
  - provides the physical assets to support the applications deployed in the enterprise.
  - Technical Architectures govern and evolve the facilities of the enterprise to support the resources identified by Information Architecture.
  - These are the assets such as servers, storage devices, and network equipment. In addition, they include the data center facilities and all the peripheral equipment, such as generators, power conditioners, and back-up units.
Sphere of influence of the LEA (Lightweight Enterprise Architecture)

- is between the expectations of leadership and the realities of producing a product or service, as shown in Figure 2.3.
Frameworks

LEA is a framework; a macro view of a system landscape.
Types of Methodologies

- Standard Development Life Cycle (SDLC)
- Waterfall
- Spiral
- Rapid Application Development (RAD)
- Rational Unified Process (RUP)
Types of Approaches
(applying methodologies)

- Standard
  - Write a change specification for an existing system.
  - Develop a technical specification for a new system.
  - Create a Request for Proposal (RFP) sent to outside vendors.
  - Use a combination of the above.

- Prototyping

- Object-oriented (O-O)

- Agile
  - Extreme Programming (XP)
  - Feature-driven development
  - Adaptive Software Development

- Process
  - Total Quality Management (TQM)
  - Business Process Reengineering (BPR)
  - Lean Management
Realms of LEA

Each realm has a specific view that is reflected in the core activities and deliverables needed in these realms.

The core activities divide into three distinct activities:

- Measures
  - What should it do?
  - What is success?
  - When will it be complete?
- Fit
  - What will it look like?
  - Where will it fit?
- Means
  - How will we build it?
  - How will we maintain it?
Federal Enterprise Architecture
(CIO Council 2001”A Practical Guide to …)

- An enterprise architecture (EA)
  - establishes the Agency-wide roadmap to achieve an Agency’s mission through optimal performance of its core business processes within an efficient information technology(IT) environment.
  - EAs are…. 
  - “blueprints” for systematically and completely defining an organization’s current (baseline) or desired (target) environment.
  - essential for evolving information systems and developing new systems that optimize their mission value.

- Evolving, developing these systems [are expressed] in
  - logical or business terms
    - (e.g., mission, business functions, information flows, and systems environments)
  and
  - technical terms
    - (e.g., software, hardware, communications), and includes a Sequencing Plan for transitioning from the baseline environment to the target environment.
Appropriate EA Products

- e.g., Products representing the Business of the Enterprise
  - Use Cases
  - Activity Models/Trees
  - IDEF [Integrated Computer Aided Manufacturing (ICAM) Definition]
  - business process models
  - Concept of Operations (CONOPS)
  - State Models.
Federal framework and Architectures

Figure 6. Structure of the FEAF Components

(Practical Guide, 2011, pg. 26)
Federal Enterprise Architectural Framework (as a matrix)
Variation -- the Department of Defense (DoD C4ISR) Architecture Framework

Figure 8. DoD C4ISR Framework
## DOD Architectural Work Products

### Figure 9. DoD C4ISR Products

<table>
<thead>
<tr>
<th>All Views</th>
<th>Operational View</th>
<th>Systems View</th>
<th>Technical View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview &amp; Summary Information</td>
<td>High-level Concept of Operations Graphic</td>
<td>Systems Interface Description</td>
<td>Technical Architecture Profile</td>
</tr>
<tr>
<td>Integrated Dictionary</td>
<td>Node Connectivity Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information Exchange Matrix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Command Relationship Chart</td>
<td>Systems Communications Description</td>
<td>Systems Matrix</td>
<td></td>
</tr>
<tr>
<td>Activity Model</td>
<td>System Functionality Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational Rules Model</td>
<td>Operational Activity to System Function</td>
<td>Systems Information Exchange Matrix</td>
<td></td>
</tr>
<tr>
<td>State Transition Description</td>
<td>System Performance Parameters Matrix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event Trace Diagrams</td>
<td>System Evolution Description</td>
<td></td>
<td></td>
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<tr>
<td>Logical Data Model</td>
<td>System Technology Forecast</td>
<td></td>
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</tr>
</tbody>
</table>

**Essential Work Products**

- Command Relationship Chart
- Activity Model
- Operational Rules Model
- State Transition Description
- Event Trace Diagrams
- Logical Data Model

**Supporting Work Products**

- Systems Communications Description
- Systems Matrix
- System Functionality Description
- Operational Activity to System Function
- Traceability Matrix
- Systems Information Exchange Matrix
- System Performance Parameters Matrix
- System Evolution Description
- System Technology Forecast
- Systems Rules Model
- System State Transition
- Systems Event Trace Diagrams
- Physical Data Model
- Standards Technology Forecast
Develop the Enterprise Architecture

1. build the architecture products based on the purpose of the architecture and the chosen framework.
Next step - the Sequencing Plan

Figure 13. Systems Migration Chart
Maintain the Architecture

Figure 19. Enterprise Architecture Transition