

Building a Winning Enterprise Architecture Team

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Scott A. Bernard, PhD



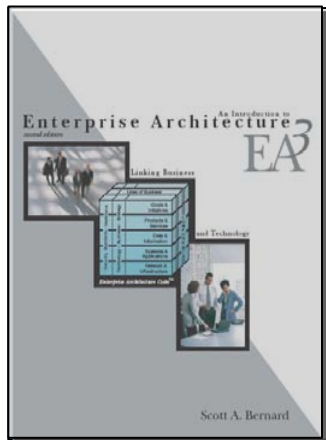
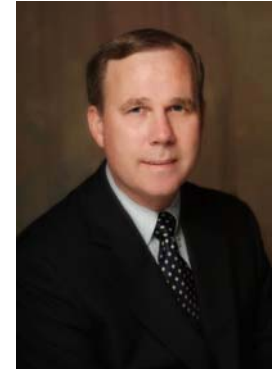
Assistant Professor
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Scott A. Bernard, PhD

Scott Bernard has over twenty years of experience in information technology (IT) management, including work in the academic, federal, military, and private sectors. Dr. Bernard has held positions as a Chief Information Officer (CIO), management consultant, line-of-business manager, network operations manager, telecommunications manager, and project manager for several major IT systems installations. He has developed enterprise architectures for public, private, and military organizations, started an EA practice for an IT management consulting firm, developed his own consulting practice, and taught EA at a number of universities, businesses, and government agencies. He is currently serves as the Deputy CIO and Chief Architect of the Federal Railroad Administration in Washington DC.



Dr. Bernard's areas of practice, research and teaching include IT-related leadership, policy development, strategic planning, enterprise architecture, systems analysis and design, IT project management, and capital planning. In 2002, Dr. Bernard created the EA³ Cube™ framework and methodology that is featured in his 2005 book *An Introduction to Enterprise Architecture: 2nd Edition*, as well as the design for an on-line EA repository that is called "Living Enterprise™."

Dr. Bernard is an Assistant Professor for the School of Information Studies at Syracuse University, and is a Senior Lecturer at the Institute for Software Research International at Carnegie Mellon University's School of Computer Science. Dr. Bernard was the founding editor of the *Journal of Enterprise Architecture*.

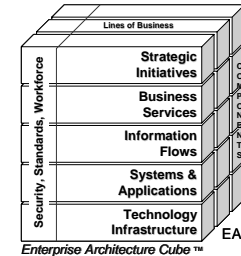
Dr. Bernard earned his PhD in Public Administration and Policy at Virginia Tech; a master's degree in Business and Personnel Management from Central Michigan University, a master's degree in Information Management from Syracuse University, and a bachelor's degree in Psychology from the University of Southern California. He is a graduate of the Naval War College, and earned a CIO Certificate and an Advanced Management Program Certificate from the National Defense University. Dr. Bernard is also a former career naval aviator who served on aircraft carriers and with shore squadrons, led IT programs, and was the Director of Network Operations for the Joint Chiefs of Staff at the Pentagon. He resides in Falls Church, Virginia with his family and enjoys gardening, traveling, and sport cars..

To Building a Winning EA Team:

- **Establish a High-Performance Team**
(Part 1 of this talk)



- **Train the Team in EA
& Supplement With Experts**
(Part 2 of this talk)

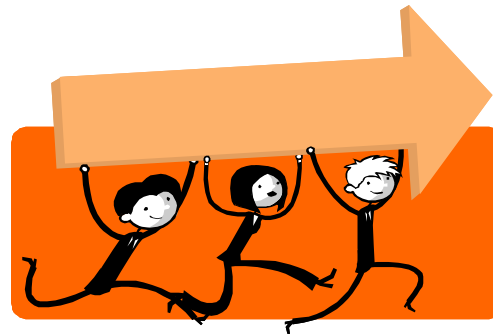


- **Do Quality EA Work**
(Part 3 of this talk)



Part 1.

Establish a High Performance Team



What is a High Performance Team?

- **Individuals who are talented and motivated:**
 - Get along and want to be there... they believe in the mission
 - Understand the “big picture” for themselves and the company
 - Put team/company goals ahead of personal goals
 - Feel that the leadership is legitimate, knowledgeable, and fair

- **People who work well together and achieve goals:**
 - On time.
 - Within budget.
 - Meeting client expectations.
 - With minimal supervision

- **Know they are the best-of-the-best and need:**
 - Worthy challenges / good managers
 - Timely feedback and appropriate rewards
 - Opportunities for growth and improvement



Put the EA Team Together

1. Identify EA Program Executive Sponsor (e.g., CIO, CTO, CFO).
2. Hire the Chief Architect (or EA Practice Lead).
3. Establish the ongoing EA Program.
4. Identify and resource EA project(s).
5. Establish client-defined project output and outcome goals.
6. Determine EA Team composition.
7. Select EA Team members (in-house and external).
8. Assign EA Team members to one or more EA projects.
9. Provide in-house EA Team members with training, as is needed.
10. Complete the EA project(s).
11. Review project(s) with the client(s), provide feedback and rewards.
12. Identify new EA project(s), make new EA Team assignments.

✓ ***Remember - Group Dynamics do apply!***

- **Forming** (getting to know each other / little friction).
 - **Norming** (establishing rules among group members / some friction)
 - **Storming** (pecking order established / possible significant friction)
 - **Performing** (group adjusts / friction lowers / work gets done)
- ✓ *All 4 steps happen again when a new team member arrives.*
- ✓ *Steps 2-4 happen when old team members depart... re-shifting.*

If Consultants Are Used – Need to Consider

On the Client-side:

- Have a dedicated executive sponsor (e.g., CIO, CTO, CFO).
- Have a knowledgeable, experienced Chief Architect.
- Have knowledgeable, enthusiastic EA team members.
- Understand how EA adds value to the enterprise.
- Know what EA is, and options for implementation.
- Have a clear understanding of, and buy-in to, team roles.
- Involve stakeholders in all phases of the EA program.

On the Consulting Side:

- Have a knowledgeable, experienced EA practice lead
- Have enough knowledgeable, experienced EA consultants at the beginning, mid, and senior levels for each project.
- Know what EA is, and options for implementation.
- Know when (and being able) to use various EA approaches.
- Know how to earn and keep client trust.

Obtain EA Team Resources

- The key to obtaining and maintaining EA Team resources is having a *strong executive sponsor*
- Important EA Team resources include:
 - **Experienced Chief Architect**
 - **Trained in-House EA Team Members**
 - **External EA Consultants**
 - **Funding for EA documentation activities**
 - **Facilities/work areas for the EA Team**
 - **Sufficient time to do EA documentation**
 - **Software tools to support EA documentation**
 - **Stakeholder and customer support**
 - **Training Programs**
 - **Governance Process to integrate Business and Technology**

Determine EA Team Composition

- The composition of the EA team depends on:
 - **The scope of the architecture**
 - **The EA approach**
 - **The availability of funding and on-site workspace**
 - **Projects being supported (client and in-house)**
- Types of EA Team members include: (at Four Levels)
 - **Strategic Planners**
 - **Business Process and Program Analysts**
 - **Solution (business) Architects**
 - **Data Modelers**
 - **Software Developers**
 - **Network Engineers**
 - **IT Security Analysts**
 - **Web Designers & Administrators**

Four Levels of Enterprise Architects

Beginning Architect

(0-2 years)

Does EA Project Work Under Supervision
Build EA Analysis & Documentation Skills
Limited Client Exposure

Mid-Level Architect

(3-5 years)

Leads EA Project Tasks
Builds EA Implementation Skills
Some Client Exposure

Senior Architect

(5+ years)

Leads EA Projects
Builds PM and CRM Skills
Responsible for Deliverables
Helps Train Beginning/Mid-Level Architects
Helps to Keep / Win Clients

Chief Architect

Practice Lead

(10+ years)

Runs EA Program / Practice
Chooses EA Approach
Hones Mgmt Skills / Builds Executive Skills
Recruits, Hires, Trains, Fires Architects
Profit/Loss Responsibility

EA Team Roles and Responsibilities

EA Team Position	EA Team Role	EA Responsibilities
Sponsor	Executive Leadership	Be the champion of the EA program. Provide resources. Assist in resolving high-level EA issues.
Chief Information Officer (CIO)	Executive Leadership and Decision-Making	Facilitate the establishment and ongoing operation of the EA Program. Lead the resolution of high-level EA issues. Integrate EA and other IT governance processes.
Chief Architect	Program Management	Manage the EA program and documentation process. Select and implement the EA framework and documentation methodology. Identify EA standards and manage EA configuration management sub-process.
Line of Business Managers	Requirements Identification	Participate in EA program decision-making. Promote the identification of IT-related requirements and EA solutions for each LOB.
Solutions Architect	Problem Solving	Collaboratively identify solutions for IT-related problems within LOBs. Support EA documentation.

EA Team Roles and Responsibilities (cont.)

EA Team Position	EA Team Role	EA Responsibilities
Systems Architect	Analysis and Design	Provide technical analysis and design support for systems-related EA component selection and implementation. Ensure that IT systems meet integration and interoperability requirements. Support EA documentation.
Data Architect	Analysis and Design	Provide technical analysis and design support for database-related EA component selection and implementation. Ensure that databases meet integration and interoperability requirements. Support EA documentation.
EA Tool Expert	Application and Database Support	Maintenance of EA Software Application. Maintenance of EA repository and information.
End-User Representative	Requirements Identification / QA	Identify end-user requirements for EA components. Provide feedback on the effectiveness of solutions.
Webmaster	Website Support	Maintenance of EA website, associated content, and links to other websites as needed.
Research Analyst	Requirements Analysis	Document and verify LOB and end-user requirements. Assist in EA component design and documentation activities



EA Team Salary Estimation

In-House EA Team Labor				
EA Team Position	EA Framework Area	Implementation Phase (Year 1) 10 FTEs	Maintenance Phase (Annual) 4.5 FTEs	Comments
Chief Architect	All	\$125,000	\$125,000	Also is EA Program Manager
Senior Solution Architect	Strategy, Business, Services	\$90,000	\$90,000	Also is Deputy Chief Architect
Solution Architect	Strategy, Business, Services	\$75,000	\$0	Not needed during maintenance phase
Data Architect	Business and Information	\$60,000	\$30,000	Half-time during maintenance phase
Systems Architect	Systems/Services, Standards	\$70,000	\$35,000	Half-time during maintenance phase
Systems Architect	Systems/Services, Standards	\$70,000	\$0	Not needed during maintenance phase
Network Architect	Technology Infrastructure	\$75,000	\$37,500	Half-time during maintenance phase
Security Architect	All	\$85,000	\$42,500	Half-time during maintenance phase
Research Analyst #1	All	\$35,000	\$0	Not needed during maintenance phase
Research Analyst #2	All	\$35,000	\$0	Not needed during maintenance phase
Total Annual Labor Cost		\$720,000	\$360,000	

Outsourcing All EA Team Labor (Except Chief Architect)				
EA Team Position	EA Framework Area	Implementation Phase (Year 1) 10 FTEs	Maintenance Phase (Annual) 4.5 FTEs	Comments
Chief Architect	All	\$125,000	\$125,000	Also is EA Program Manager
Senior Management Consultant	Strategy, Business, Services	\$309,050	\$309,050	Full-time
Junior IT Consultant	Strategy, Business, Services	\$144,200	\$0	Not needed during maintenance phase
Data Architect	Business and Information	\$144,200	\$72,100	Half-time during maintenance phase
Systems Architect	Systems/Services, Standards	\$144,200	\$72,100	Half-time during maintenance phase
Systems Architect	Systems/Services, Standards	\$144,200	\$0	Not needed during maintenance phase
Network Architect	Technology Infrastructure	\$309,050	\$154,525	Half-time during maintenance phase
Security Architect	All	\$309,200	\$154,525	Half-time during maintenance phase
Research Analyst #1	All	\$144,200	\$0	Not needed during maintenance phase
Research Analyst #2	All	\$144,200	\$0	Not needed during maintenance phase
Total Annual Labor Cost		\$1,917,500	\$887,300	

Hiring Enterprise Architects


- **Look at long-term versus short-term team needs:**
 - Hire based on long-term EA team needs
 - Outsource/partner for short-term EA team needs
- **Prior to advertising the EA position:**
 - Look at the skill mix needed on the EA team
 - Look at the experience level needed
 - Look at normal and superior salary ranges
- **At the job interview check for:**
 - Applicant's appearance and demeanor
 - Applicant's EA knowledge and prior experience
 - Applicant's communication skills (oral, written, listening)
 - Applicant's analytic skills
 - Applicant's motivation for taking the job
 - Fit with Chief Architect, other team members, clients

Training Enterprise Architects

When Training Enterprise Architects:

- Standardize training for junior, mid, and senior architects.
- Use the CMU-ISRI Knowledge, Skills & Abilities (KSA) List
- Develop a Professional Development Plan (PDP) for each architect to reach near-term and long-term goals that benefit the team and the individual
- Review the PDP prior to promotion and salary actions, as well as at the completion of client and in-house projects
- Tie attainment of PDP goals to raises, promotions, and project leadership assignments
- Enrich the in-house EA training program with commercial training courses and educational degree programs
- Require a pay-back period for training and education

Enterprise Architect Certification

Carnegie Mellon University		 Institute for Software Research International Enterprise Architecture Education Standards v2.2 © CMU/ISRI - 2006			
Enterprise Architecture Standards for Education © 2006		Beginning Architect	Mid-Level Architect	Senior Architect	Notes
Knowledge and Skill Areas (KSAs)		(0-2 Years of Experience)	(3-5 Years of Experience)	(5+ Years of Experience)	
1.0	EA Theory and Practice				
1.1	EA Basic Concepts	x	x	x	
1.2	The Information Age: Driver of Architectures	x	x	x	
1.3	EA Roots: Underlying Theory	x	x	x	
1.4	EA Basic Element #1: Implementation Method	x	x	x	
1.5	EA Basic Element #2: Documentation Framework	x	x	x	
1.6	EA Basic Element #3: Components & Artifacts	x	x	x	
1.7	EA Basic Element #4: Repository & Tools	x	x	x	
1.8	EA Basic Element #5: Best Practices	x	x	x	
2.0	EA Documentation				
2.1	Documentation Overview	x	x	x	
2.2	Strategy Sub-Architecture	x	x	x	
2.3	Business Sub-Architecture	x	x	x	
2.4	Data Sub-Architecture	x	x	x	
2.5	Systems/Applications Sub-Architecture	x	x	x	
2.6	Network Sub-Architecture	x	x	x	
2.7	Security Sub-Architecture	x	x	x	
2.8	Architecture Standards	x	x	x	
3.0	EA Implementation				
3.1	EA Implementation Overview		x	x	
3.2	EA Requirements and Scope		x	x	
3.3	EA Framework Selection		x	x	
3.4	EA Tool and Repository Selection		x	x	
3.5	Documenting the Current Architecture		x	x	
3.6	Documenting the Future Architecture		x	x	
3.7	Architecture Transition Management		x	x	
3.8	Populating the EA Repository		x	x	
4.0	EA Program Management				
4.1	EA Program Management Overview			x	
4.2	EA Program Critical Success Factors			x	
4.3	Managing EA Program Budget & Schedule			x	
4.4	Managing EA Program Risk			x	
4.5	EA Program Metrics			x	
4.6	EA Team Development			x	
4.7	EA Program Maturity			x	
4.8	EA Program Governance			x	
5.0	EA Security Implementation				
5.1	Information Systems Governance		x	x	
5.2	Operations Security		x	x	
5.3	Personnel Security		x	x	
5.4	Information and Dataflow Security		x	x	
5.5	Application Development Security		x	x	
5.6	Systems Security		x	x	
5.7	Infrastructure Security		x	x	
5.8	Physical Security		x	x	

On-Line and Classroom Courses Available

Enterprise Architect Certification

EA Standards for Education (EASE)

Area 1: EA Theory and Practice

Enterprise Architecture Standards for Education © 2006		Beginning Architect	Mid-Level Architect	Senior Architect
Knowledge and Skill Areas (KSAs)		<i>(0-2 Years of Experience)</i>	<i>(3-5 Years of Experience)</i>	<i>(5+ Years of Experience)</i>
1.0	EA Theory and Practice			
1.1	EA Basic Concepts	X	X	X
1.2	The Information Age: Driver of Architectures	X	X	X
1.3	EA Roots: Underlying Theory	X	X	X
1.4	EA Basic Element #1: Implementation Method	X	X	X
1.5	EA Basic Element #2: Documentation Framework	X	X	X
1.6	EA Basic Element #3: Components & Artifacts	X	X	X
1.7	EA Basic Element #4: Repository & Tools	X	X	X
1.8	EA Basic Element #5: Best Practices	X	X	X

Carnegie Mellon EA Knowledge and Skill Areas (KSA) 1.1 - 1.8

Course offering schedule and information is available at:

<http://strategic.isri.cmu.edu/v2/EnterpriseArchitecture.jsp>

Enterprise Architect Certification

EA Standards for Education (EASE)

Area 2: EA Documentation

Enterprise Architecture Standards for Education © 2006		Beginning Architect	Mid-Level Architect	Senior Architect
Knowledge and Skill Areas (KSAs)		(0-2 Years of Experience)	(3-5 Years of Experience)	(5+ Years of Experience)
2.0	EA Documentation			
2.1	Documentation Overview	X	X	X
2.2	Strategy Sub-Architecture	X	X	X
2.3	Business Sub-Architecture	X	X	X
2.4	Data Sub-Architecture	X	X	X
2.5	Systems/Applications Sub-Architecture	X	X	X
2.6	Network Sub-Architecture	X	X	X
2.7	Security Sub-Architecture	X	X	X
2.8	Architecture Standards	X	X	X

Carnegie Mellon EA Knowledge and Skill Areas (KSA) 2.1 - 2.8

Course offering schedule and information is available at:

<http://strategic.isri.cmu.edu/v2/EnterpriseArchitecture.jsp>

Enterprise Architect Certification

EA Standards for Education (EASE)

Area 3: EA Implementation

Enterprise Architecture Standards for Education © 2006		Beginning Architect	Mid-Level Architect	Senior Architect
Knowledge and Skill Areas (KSAs)		<i>(0-2 Years of Experience)</i>	<i>(3-5 Years of Experience)</i>	<i>(5+ Years of Experience)</i>
3.0	EA Implementation			
3.1	EA Implementation Overview		X	X
3.2	EA Requirements and Scope		X	X
3.3	EA Framework Selection		X	X
3.4	EA Tool and Repository Selection		X	X
3.5	Documenting the Current Architecture		X	X
3.6	Documenting the Future Architecture		X	X
3.7	Architecture Transition Management		X	X
3.8	Populating the EA Repository		X	X

Carnegie Mellon EA Knowledge and Skill Areas (KSA) 3.1 - 3.8

Course offering schedule and information is available at:

<http://strategic.isri.cmu.edu/v2/EnterpriseArchitecture.jsp>

Enterprise Architect Certification

EA Standards for Education (EASE)

Area 4: EA Program Management

Enterprise Architecture Standards for Education © 2006		Beginning Architect	Mid-Level Architect	Senior Architect
Knowledge and Skill Areas (KSAs)		(0-2 Years of Experience)	(3-5 Years of Experience)	(5+ Years of Experience)
4.0	EA Program Management			
4.1	EA Program Management Overview			X
4.2	EA Program Critical Success Factors			X
4.3	Managing EA Program Budget & Schedule			X
4.4	Managing EA Program Risk			X
4.5	EA Program Metrics			X
4.6	EA Team Development			X
4.7	EA Program Maturity			X
4.8	EA Program Governance			X

Carnegie Mellon EA Knowledge and Skill Areas (KSA) 4.1 - 4.8

Course offering schedule and information is available at:
<http://strategic.isri.cmu.edu/v2/EnterpriseArchitecture.jsp>

Enterprise Architect Certification

EA Standards for Education (EASE)

Area 5: EA Security Implementation

Enterprise Architecture Standards for Education © 2006		Beginning Architect	Mid-Level Architect	Senior Architect
Knowledge and Skill Areas (KSAs)		(0-2 Years of Experience)	(3-5 Years of Experience)	(5+ Years of Experience)
5.0	EA Security Implementation			
5.1	Information Systems Governance		X	X
5.2	Operations Security		X	X
5.3	Personnel Security		X	X
5.4	Information and Dataflow Security		X	X
5.5	Application Development Security		X	X
5.6	Systems Security		X	X
5.7	Infrastructure Security		X	X
5.8	Physical Security		X	X

Carnegie Mellon EA Knowledge and Skill Areas (KSA) 5.1 - 5.8

Course offering schedule and information is available at:

<http://strategic.isri.cmu.edu/v2/EnterpriseArchitecture.jsp>

Mentoring Enterprise Architects

When Mentoring an Enterprise Architect:

- Let them come to you
- Know what you are talking about
- It is an honor to mentor – maintain privacy where appropriate
- Keep it positive and professional – not personal (refer that to HR)
- Be honest and tactful – mentoring is about building up
- Help the architect understand their strengths and weaknesses
- Keep their Professional Development Plan in mind
- Balance their needs with the needs of the team and organization
- You don't have to be their boss to be a mentor
- Promote work / life balance - long term view of career
- Promote realistic views of their promotion path and pace
- Promote realistic views of their salary growth path

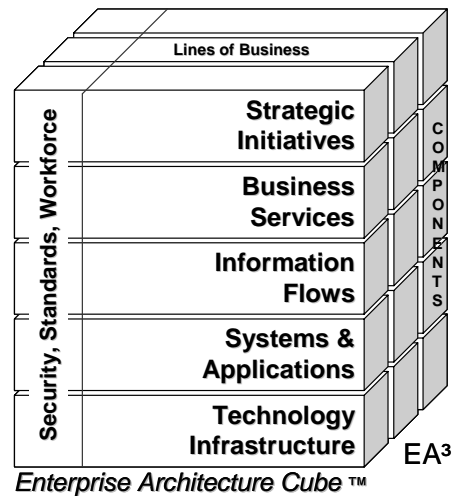
Releasing Enterprise Architects

When Releasing an Enterprise Architect from employment:

- Must be able to clearly show how the architect did not meet formally documented performance goals that were briefed to the employee as part of the Personal Development Plan.
- Have detailed formal documentation of performance failures. Give the architect chance(s) to improve that don't impact client or stakeholder relationships and projects.
- Hold formal meetings on performance failures, with a neutral third-party (HR representative).
- Do not let meetings be about personal items... keep it professional, focus on the business goals and needs of the EA team.
- Let the HR Department handle the termination interview.
- Ensure access to resources is immediately cut off (**email, desk, files**) .
- Have a replacement hiring action completed or underway.
- Use HR to handle post-employment communications / references.

Part 2.

Training the Team in Enterprise Architecture and Supplement with Experts



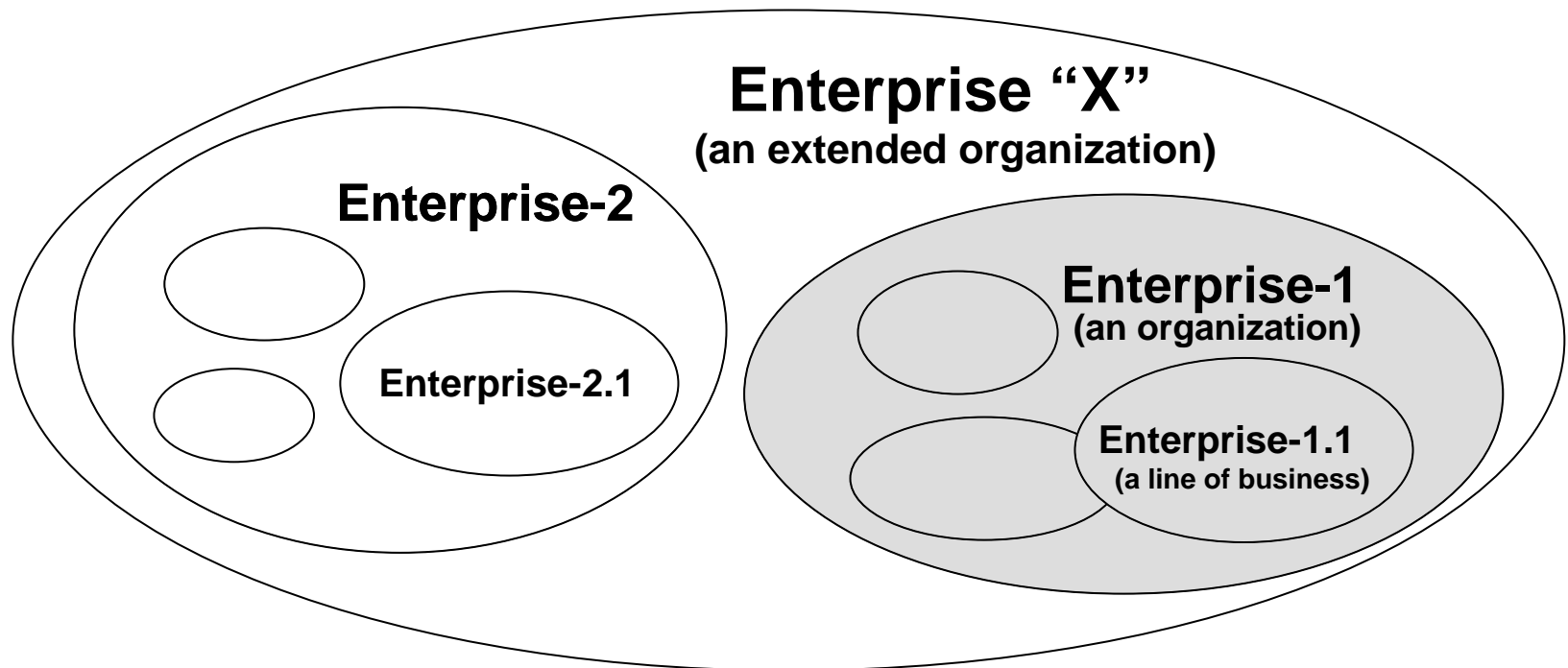
Enterprise Architecture - CIO Perspective

From a Chief Information Officer's perspective, Enterprise Architecture (EA) is one of a number of functional areas which contribute to an integrated approach to managing business and technology resources to achieve strategic goals.

Leadership & Vision	Strategic Planning	Policy & Procedures
Operations	Cyber Security	Technology Assessment
Enterprise Architecture	Capital Planning	Acquisition & Contracting
Program Management	Records Management	Workforce Management

Enterprise - Defined

Enterprise: An area of common activity and goals within an organization or between several organizations, where information and other resources are exchanged. *An Introduction to Enterprise Architecture © 2005*



Architecture - Defined

Architecture: 1. the science, art, or profession of designing and constructing buildings, bridges, etc; 2. a building or buildings collectively; 3. a style of construction; 4. design and construction; **5. any framework or system.**

Webster's New World Dictionary. Simon and Shuster; 1980.

Organizations are a type of system:
(e.g., Businesses, Agencies, Military Units,
Hospitals, Universities, Non-Profits)

EA uses a framework to document the architecture of large, complex human organizations. These organizations are goal-oriented social systems that are referred to as “enterprises”

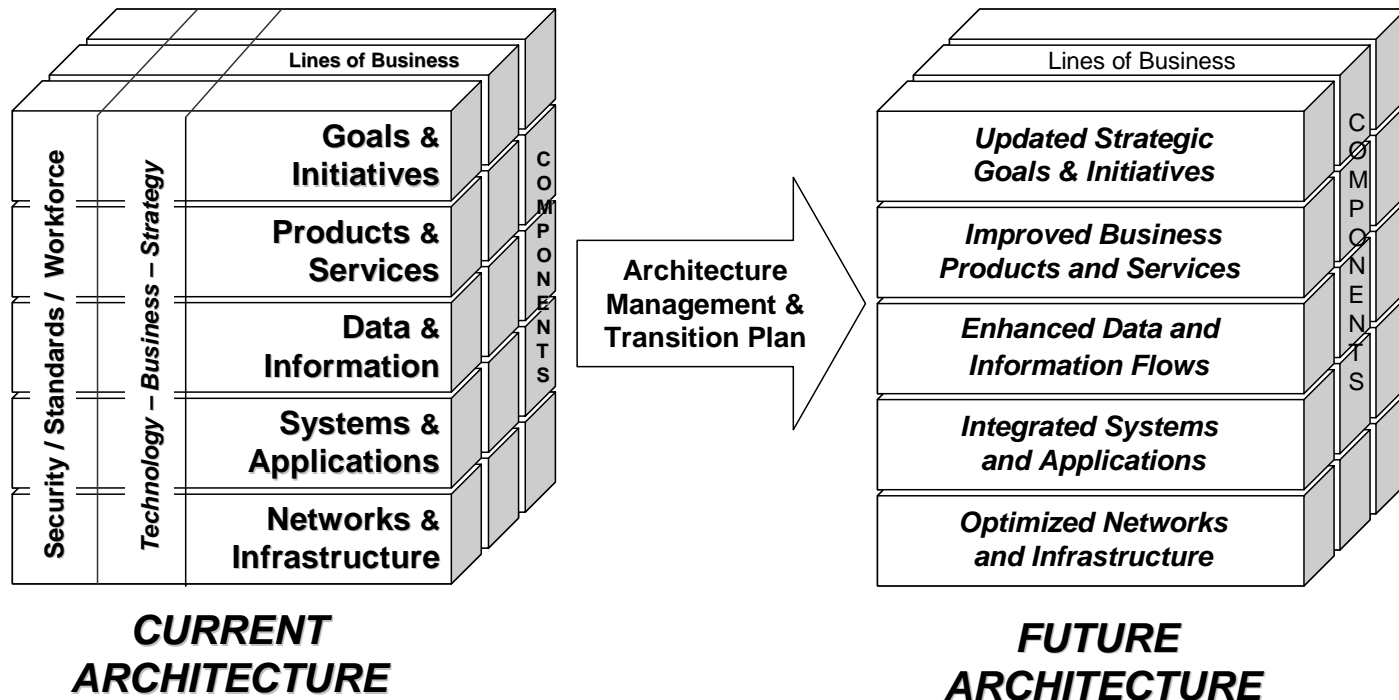


Enterprises

Enterprise Architecture - Defined

Enterprise Architecture: The analysis and documentation of an enterprise in its current and future states from a strategy, business, and technology perspective. **$EA = S + B + T$**

An Introduction to Enterprise Architecture © 2005



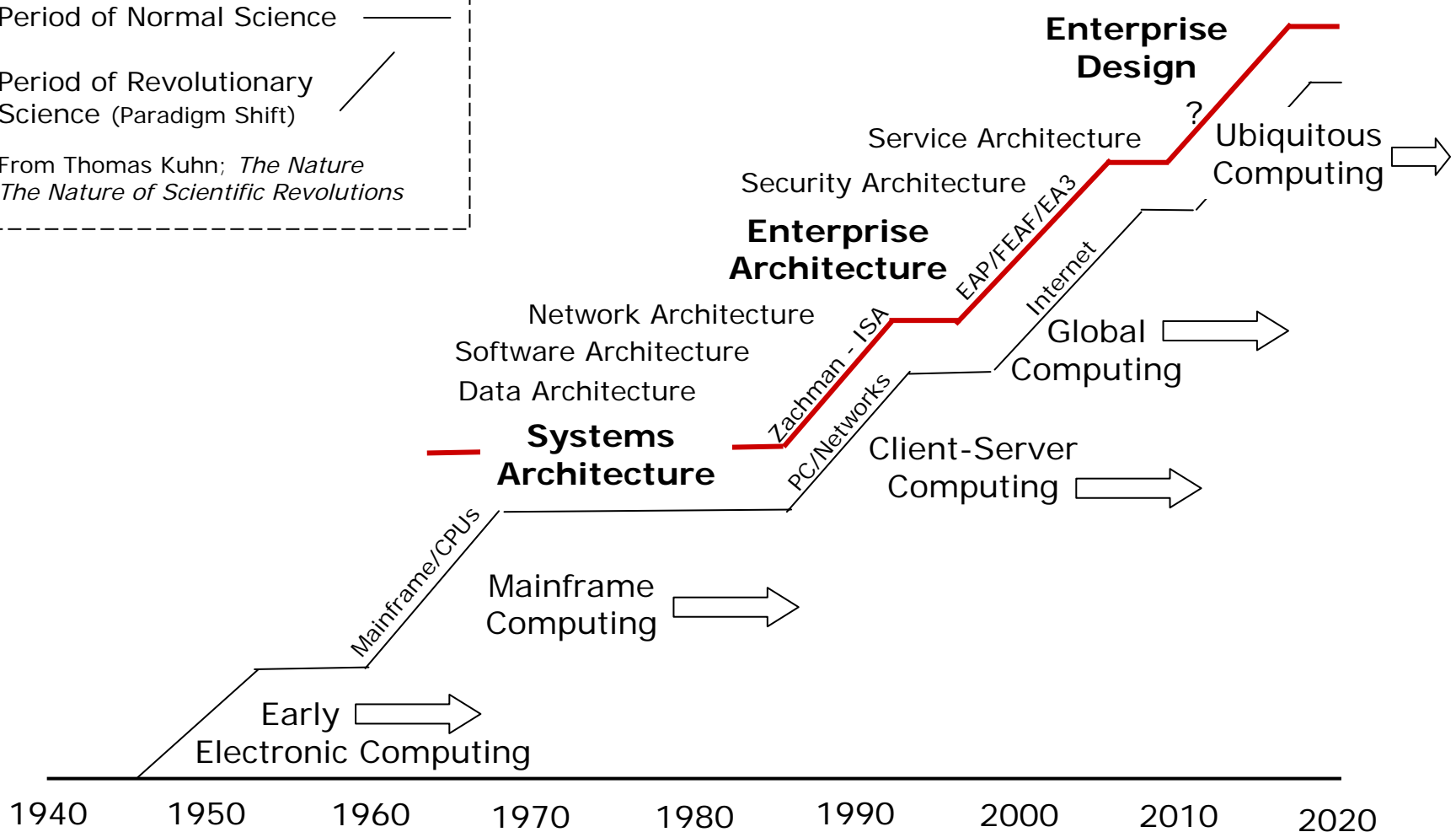
Historical Roots of EA - Precursors

- Distinguishing features of EA include:
 - **Enterprise-wide views**
 - **Strategy and business drives technology solutions**
 - **Helps improve the performance of large, complex enterprises**
- Elements of EA have been practiced for over 40 years under different names:
 - Information Systems Architecture
 - Information Technology Architecture
 - Information Architecture
 - Information Engineering
 - Business Activity Modeling
 - Data Architecture
 - Software/Application Architecture
 - Service-Oriented Architecture
 - Model-Driven Architecture
 - Network-Centric Engineering
 - Telecommunications Architecture
 - Security Architecture

All of these activities still contribute to EA, but should be considered to be sub-architectures or best practices that help EA establishment, implementation & use

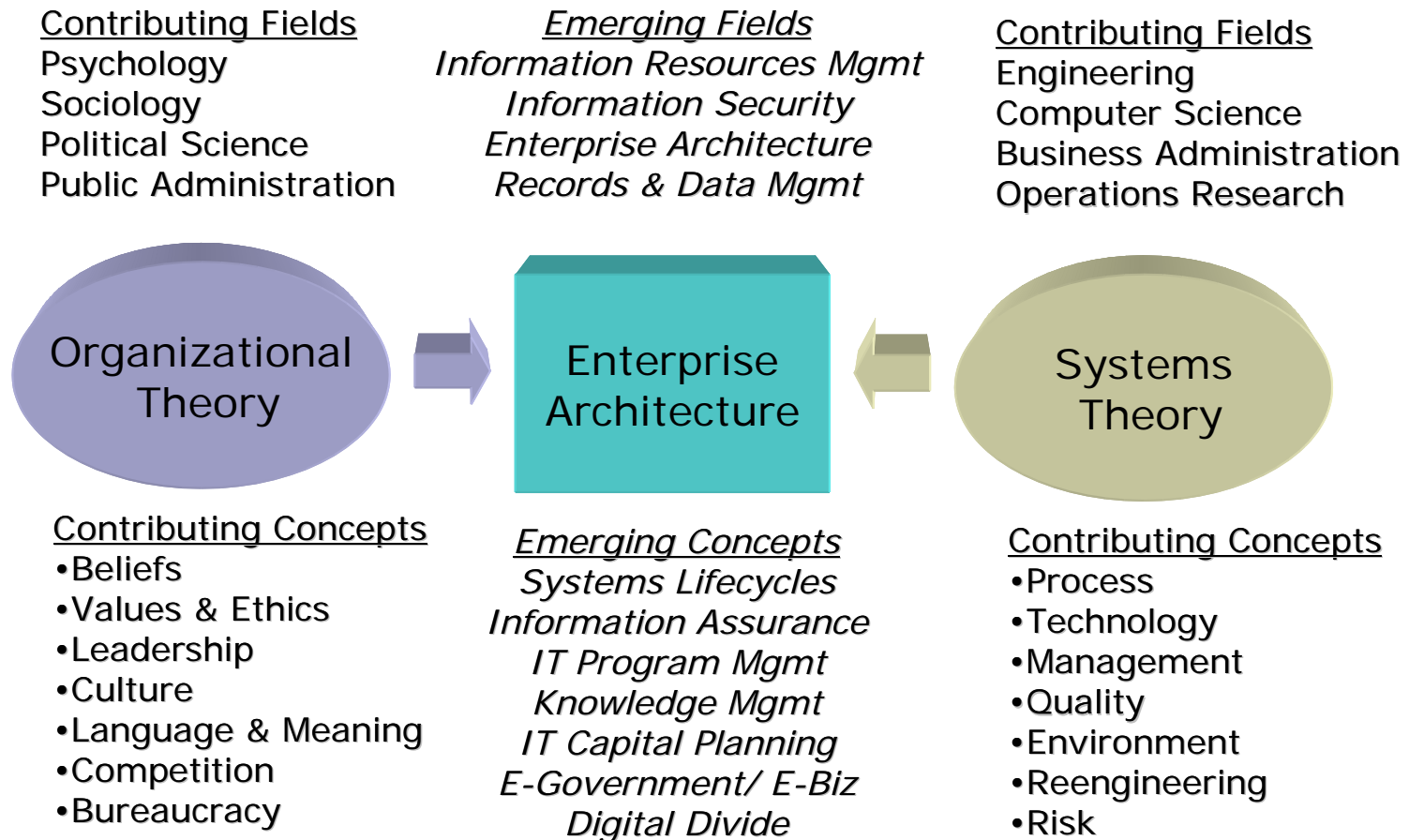
Historical Roots of EA – Paradigm Shifts

Period of Normal Science ———
 Period of Revolutionary Science (Paradigm Shift) /
 From Thomas Kuhn; *The Nature of Scientific Revolutions*



Historical Roots of EA – Contributing Fields

- EA has foundations in theory and practice that come from both the social and the physical sciences.



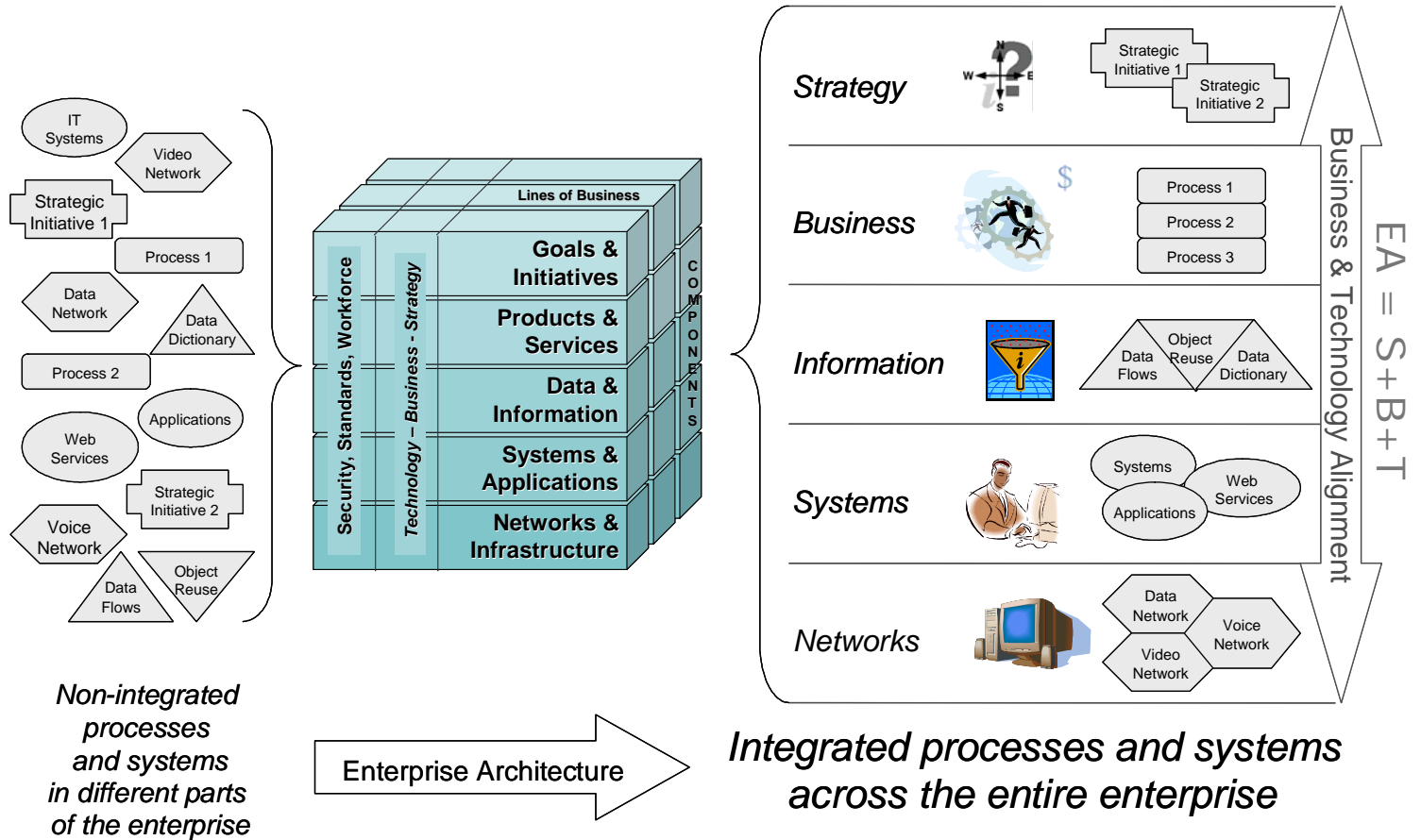
Historical Roots of EA - Global Standards

- **International Standards for EA have existed for over 10 years:**
 - **ISO 14258 (1998):** Industrial AIS - Concepts and Rules for Enterprise Models
 - **ISO 15704 (2000):** Requirements for Enterprise Reference Architectures & Methods
 - **CEN ENV 40003 (1991):** CIMOSA Architecture Framework. Pre EN ISO 19439 (2002)
 - **CEN ENV 12204 (1996):** Constructs for Enterprise Modeling. Pre EN ISO 19440 (1996)

- **Specific approaches to EA have existed for over 15 years:**
 - Private Sector
 - Open Standard Approaches
 - Zachman EA Framework
 - Spewak EA Planning Method (EAP)
 - The Open Group Architecture Framework (TOGAF)
 - EA3 Cube Framework
 - Proprietary Approaches
 - Consulting Firms (e.g., Gartner Group)
 - Technology Firms (e.g., IBM, Microsoft)
 - Public Sector
 - Federal EA Framework & Reference Models (FEAF/FEA-RMs)
 - Department of Defense Framework (DODAF)
 - National Association of State CIO's (NASCIO) EA Toolkit

Enterprise Architecture – Overview

Enterprise Architecture helps to integrate and manage IT resources from a strategy and business-driven viewpoint

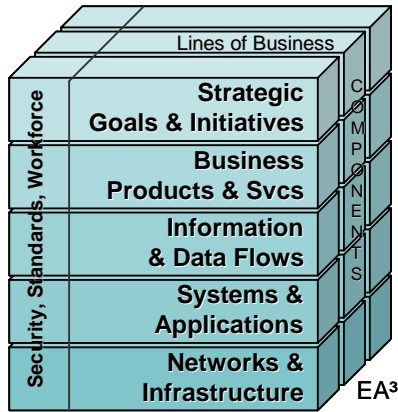


Non-integrated processes and systems in different parts of the enterprise

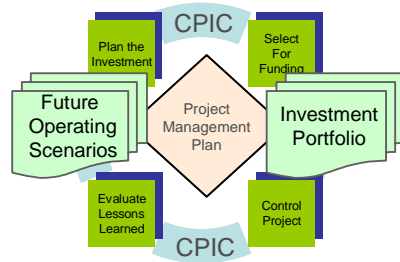
Enterprise Architecture

Integrated processes and systems across the entire enterprise

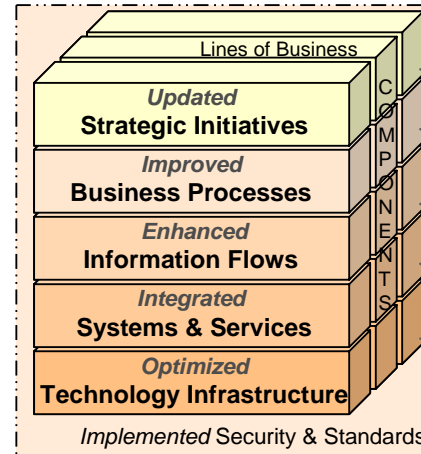
Enterprise Architecture – Lifecycle



Current EA Views



Develop the EA Management Plan

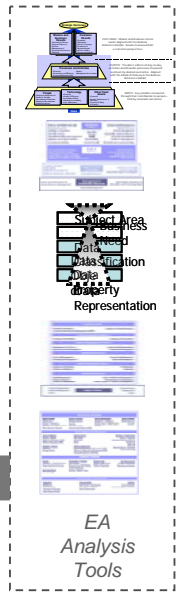


Future EA Views

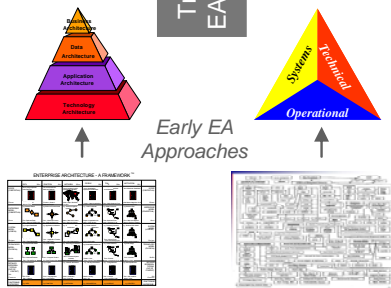
Categorize EA Information

- PRM
- BRM
- DRM
- SRM
- TRM

Archive EA Info.



Transform EA Program



Start

Integrated Business & Technology Operating Environment



Actionable EA Information

- Outcomes:
- Strategic Alignment of IT
 - Improved Service Delivery
 - Reduced IT Operating Costs
 - Improved Decision-Making
 - Improved Communication

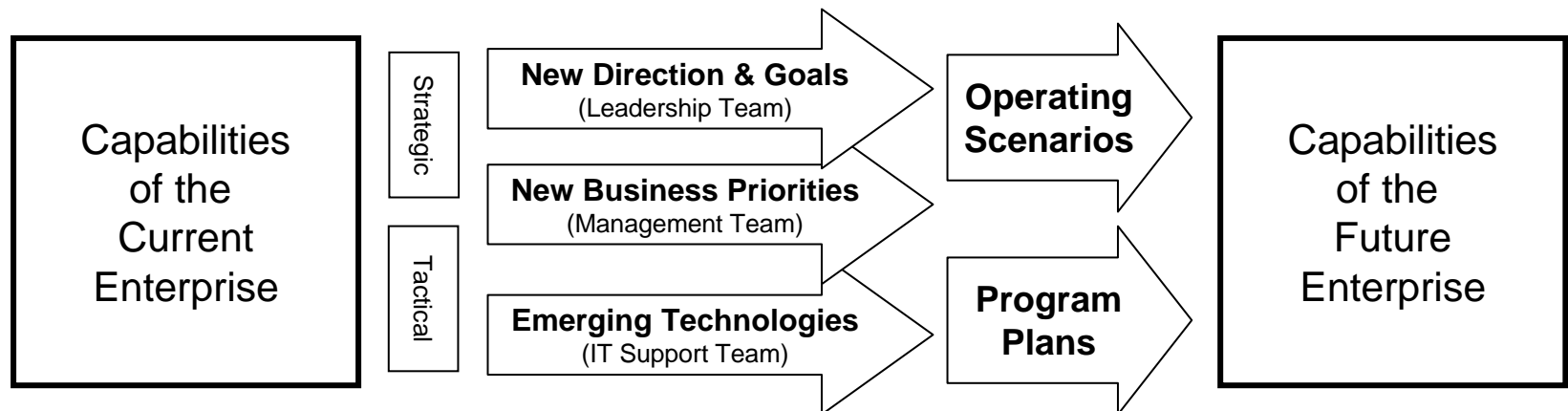
Finish

EA Program	EA Migration Plan	EA Standards	EA Team	EA Schedule	Site Map	
Enterprise Architecture Repository Version XX Released: January 15, 200X						
Key Word Search	Strategic Goals	Business Processes	Information Flows	Support Applications	Network Infrastructure	Security Zone
High Level View	Mission & Vision	Lines Of Business	Knowledge Management	Operational Support	Wide Area Network	Policy & Procedures
Mid Level View	Goals & Initiatives	Supply Chains	Information Exchange	Office Automation	Local Area Network	Privacy
Detailed View	Performance Measures	Technology Investment Portfolio	Data Dictionary/ Object Library	Development Projects	Desktop & Portable PCs	Technology Inventory

EA Repository

Enterprise Architecture - Drivers

- EA documents both current & future views of the enterprise
- Changes in an architecture come from 3 levels of input:
 - **Executive** input on *strategic direction and priority*
 - **Business Manager** input on *process changes*
 - **Technology Manager** input on *supporting IT changes*



Enterprise Architecture – Outcomes

- The products of EA are standards, documentation artifacts, and an IT governance process that help to:
 - **Achieve strategic goals that depend on IT resources**
 - **Improve business performance by maximizing IT efficiency**
 - **Support the desire of executives and managers to have strategic priorities/business requirements drive IT solutions**
 - **Link multiple IT networks, systems, applications, services, and databases across the entire enterprise**
 - **Share information between lines of business**
 - **Integrate several forms of applications and local/wide area networks that lacked open standards**
 - **Reduce duplicative IT resources across the enterprise**
 - **Protect data and IT assets that rely on enterprise-wide approaches**
 - **Maximize the effective use of limited budgets**
 - **Improve human capital management in IT knowledge/skill areas**

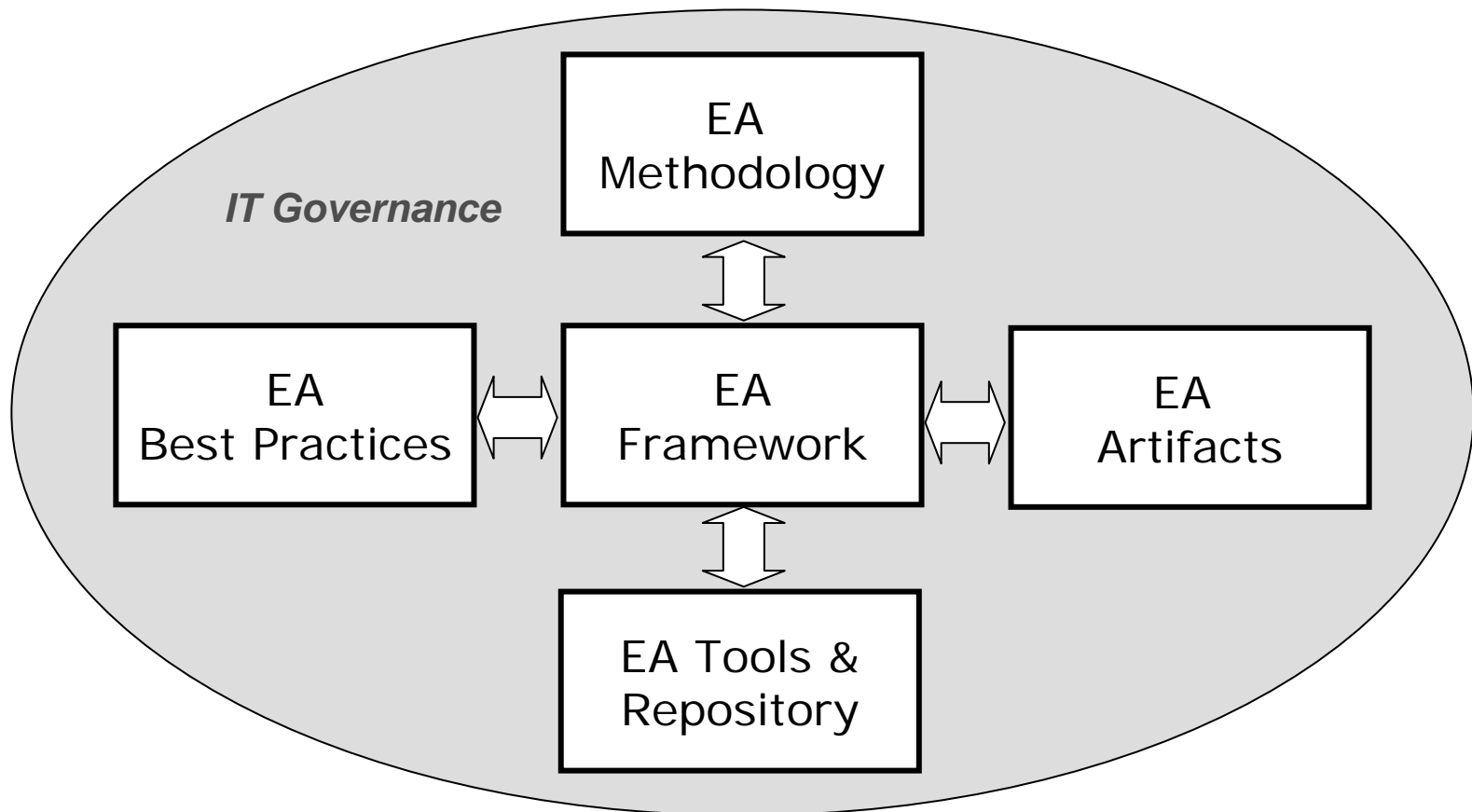
Enterprise Architecture – Activities

EA activities are two-fold: a management program and a documentation method, which together improve performance through the integration of strategic, business, and technology planning and decision-making.

- **As a management program, EA provides:**
 - Resource Alignment: Resource planning and standards determination
 - Standardized Policy: Resource governance and implementation
 - Decision Support: Financial control and configuration management
 - Resource Oversight: Lifecycle approach to development and management
- **As a documentation method, EA provides:**
 - EA Approach: A modeling framework & implementation methodology
 - Current Architecture: Views of as-is strategies, processes, resources
 - Future Architecture: Views of to-be strategies, processes, resources
 - EA Management Plan: To move from the current to the future EA

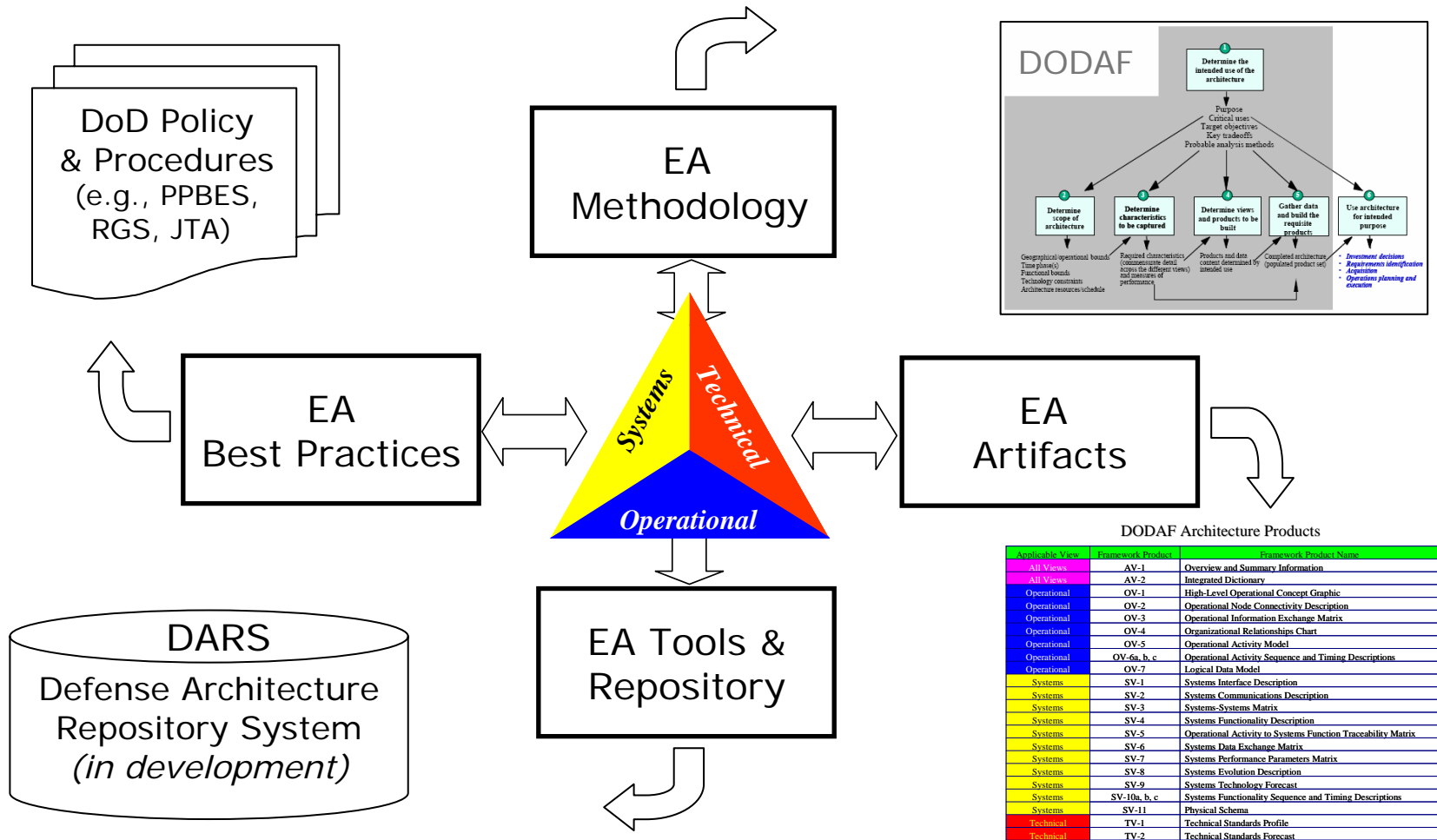
Enterprise Architecture - Complete Approach

A “complete” EA approach must have ***all of these five elements***, which are ***specifically designed to work together***. EA is part of ***IT Governance***.



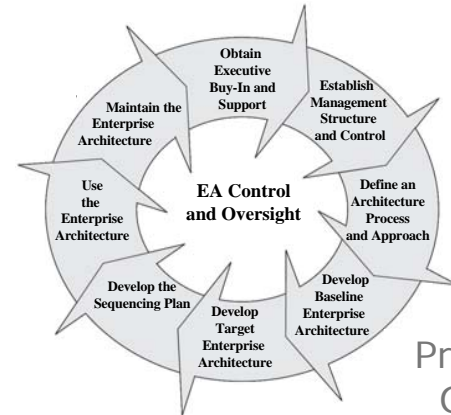
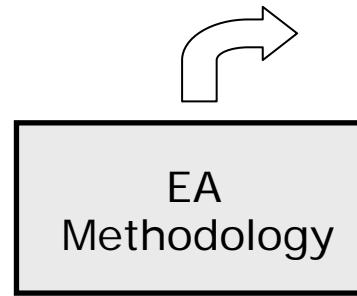
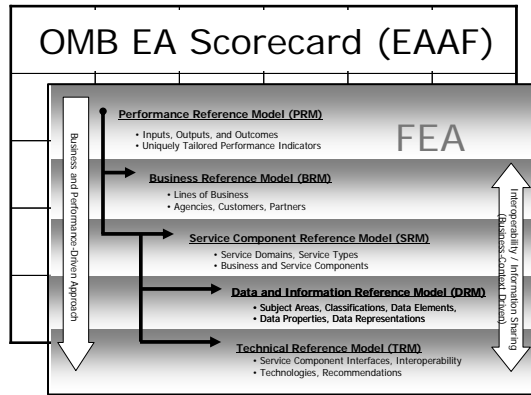
Example of an Incomplete EA Approach - DODAF

These 5 EA elements aren't complete or aren't designed to work together

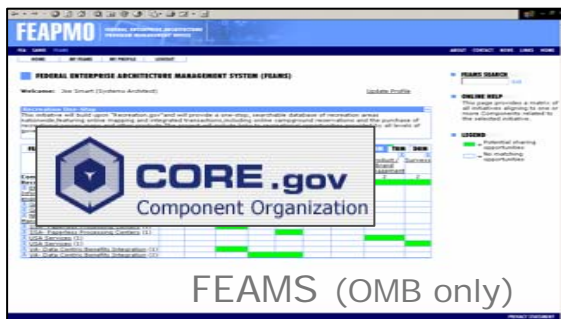
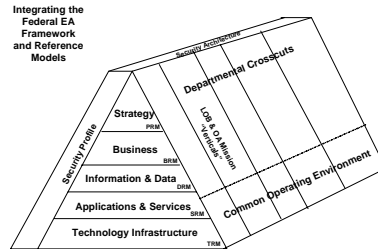
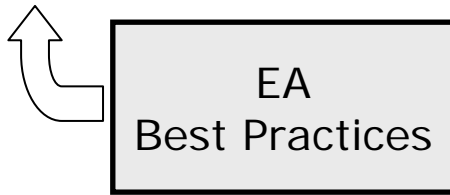


Example of an Incomplete EA Approach – FEAF/FEA

These five EA elements are not designed to work together



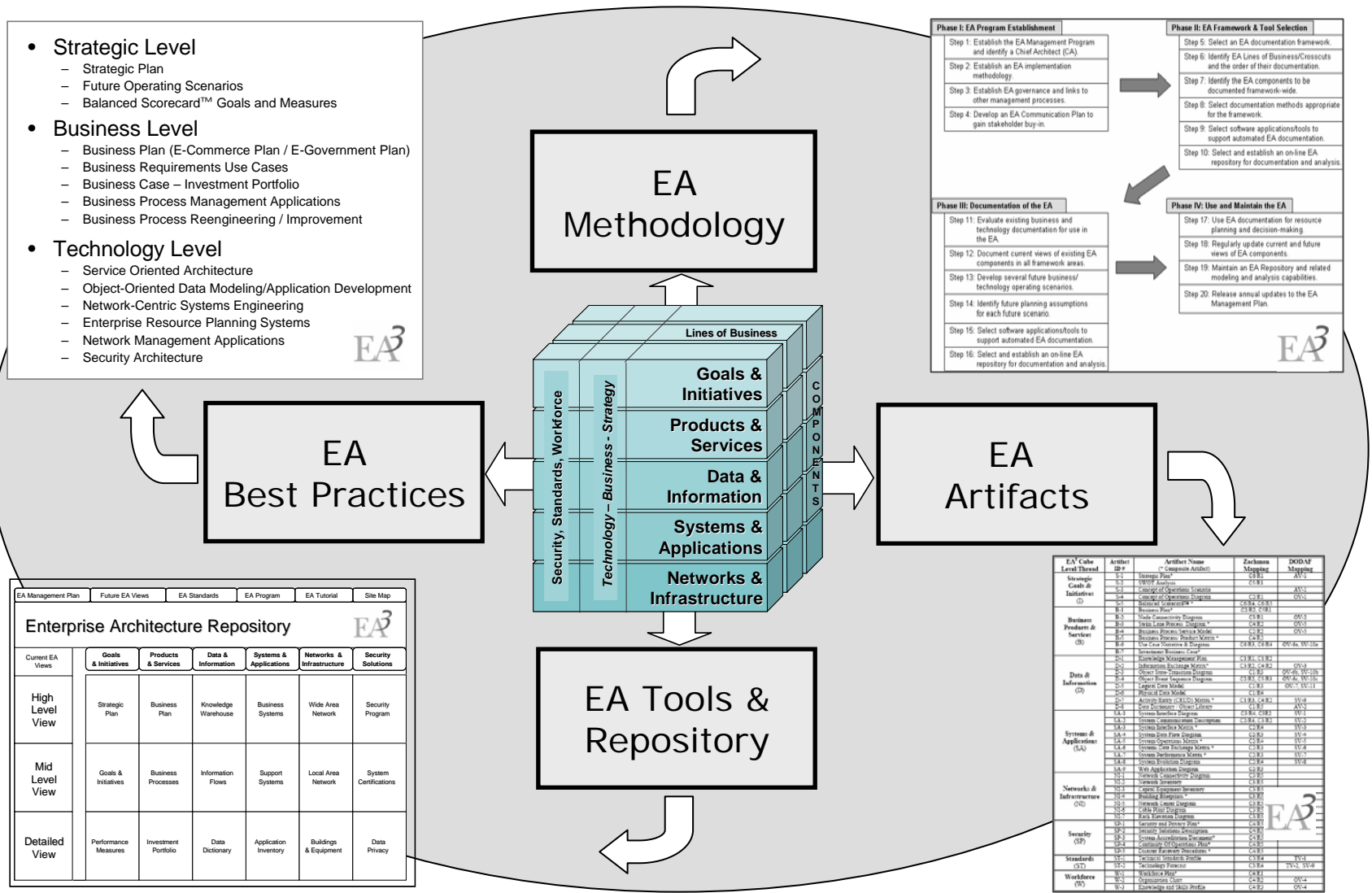
Practical Guide



ENTERPRISE ARCHITECTURE - A FRAMEWORK™

	DATA	FUNCTION	NETWORK	PEOPLE	TIME	MOTIVATION	SCOPE
SCOPE (CONTEXTUAL)	List of Things/Entities in the Universe	List of Functions/Use Cases/Activities	List of Locations & where things happen	List of Organizations/People	List of Dates/Significant Events	List of Business Goals/Values	SCOPE (CONTEXTUAL)
ENTERPRISE MODEL (CONCEPTUAL)	Entity-Relationship Model	Business Process Model	Business Network	People - Major Organization	Time - Major Business Event	Goal/Strategy/Plan	ENTERPRISE MODEL (CONCEPTUAL)
SYSTEM MODEL (LOGICAL)	Entity-Data Entity Model - Data Relationships	Flow - Business Processes	Network - Business Processes	People - Organizational Roles - Skills/Expertise	Time - Business Event Cycle - Business Cycle	Goal - Organizational Goals - Business Strategy	SYSTEM MODEL (LOGICAL)
TECHNOLOGY MODEL (PHYSICAL)	Entity - Physical Data Model	Flow - Application Functions	Network - Application Functions	People - Role/Position/Physical Location	Time - System Event Cycle - System Cycle	Goal - Business Objectives	TECHNOLOGY MODEL (PHYSICAL)
DETAILED REPRESENTATION (OUT-OF-CONTEXT)	Entity - Logical/Physical Data Model	Flow - Computer Functions	Network - Computer Functions	People - Role/Position/Physical Location	Time - Detailed Event Cycle/Process Cycle	Goal - Detailed Business Objectives	DETAILED REPRESENTATION (OUT-OF-CONTEXT)
FUNCTIONING ENTERPRISE	Entity - Data	Flow - Function	Network - Information	People - Job	Time - Event Cycle/Process Cycle	Goal - Business Objectives	FUNCTIONING ENTERPRISE

Example of a Complete EA Approach - EA³ Cube



5 Elements of a Complete Approach - Methodology

Phase I: EA Program Establishment

- Step 1: Establish the EA Management Program and identify a Chief Architect (CA).
- Step 2: Establish an EA implementation methodology.
- Step 3: Establish EA governance and links to other management processes.
- Step 4: Develop an EA Communication Plan to gain stakeholder buy-in.



Phase II: EA Framework & Tool Selection

- Step 5: Select an EA documentation framework.
- Step 6: Identify EA Lines of Business/Crosscuts and the order of their documentation.
- Step 7: Identify the EA components to be documented framework-wide.
- Step 8: Select documentation methods appropriate for the framework.
- Step 9: Select software applications/tools to support automated EA documentation.
- Step 10: Select and establish an on-line EA repository for documentation and analysis.



Phase III: Documentation of the EA

- Step 11: Evaluate existing business and technology documentation for use in the EA.
- Step 12: Document current views of existing EA components in all framework areas.
- Step 13: Develop several future business/technology operating scenarios.
- Step 14: Identify future planning assumptions for each future scenario.
- Step 15: Select software applications/tools to support automated EA documentation.
- Step 16: Select and establish an on-line EA repository for documentation and analysis.



Phase IV: Use and Maintain the EA

- Step 17: Use EA documentation for resource planning and decision-making.
- Step 18: Regularly update current and future views of EA components.
- Step 19: Maintain an EA Repository and related modeling and analysis capabilities.
- Step 20: Release annual updates to the EA Management Plan.

5 Elements of a Complete Approach - Framework

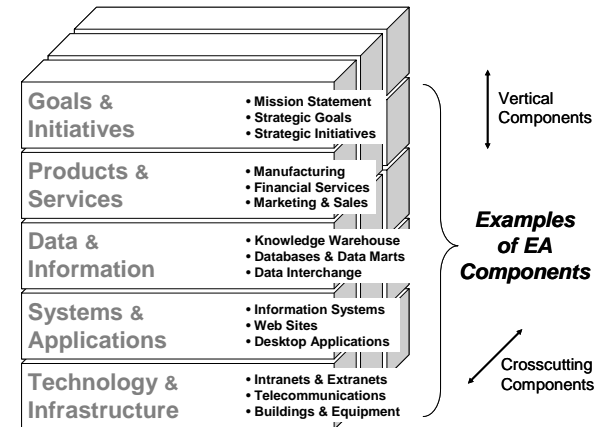
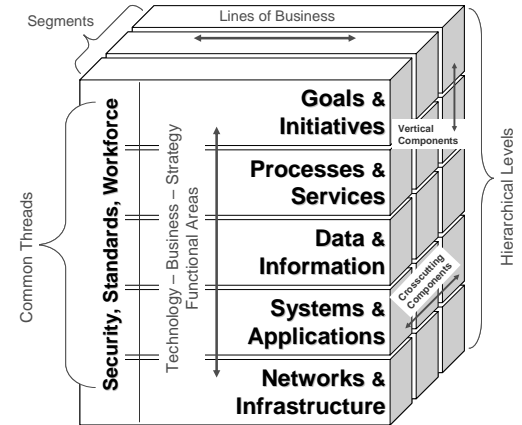
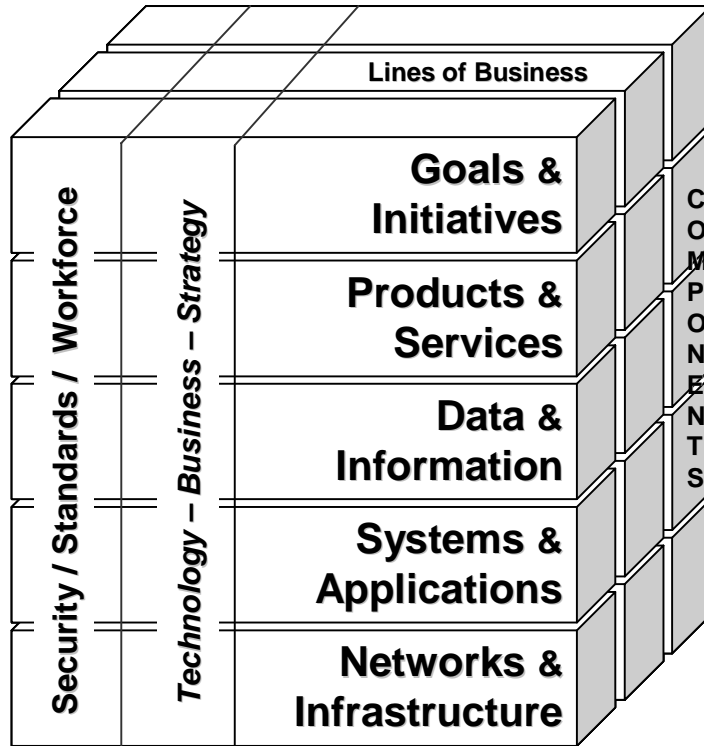
Example: EA³ Approach

Framework Dimension 3: Artifacts

The documentation of components at each level of the architecture, including all threads

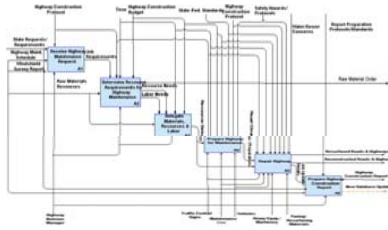
Framework Dimension 2: Segments
Vertical sub-areas of the enterprise with distinct business activities and resources

Framework Dimension 1: Levels
Sub-architectures; distinct functional areas and their relationships

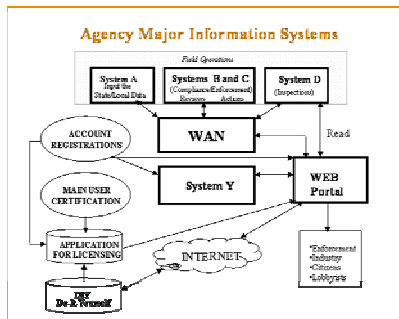


EA³

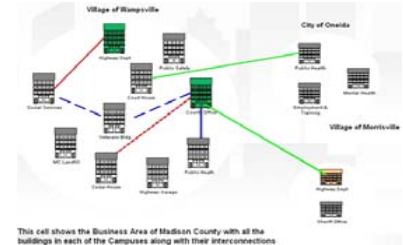
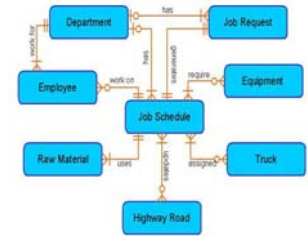
5 Elements of a Complete Approach - Artifacts



HIGHWAY CONSTRUCTION AND MAINTENANCE	
State Requirements	Details of requirements for construction given by the state.
Maintenance Schedule	Time and work schedule for Highway Maintenance.
Survey Reports	Details of survey carried out for the highways.
Budget	Details money allocated for Highway work.
Safety Protocols	Safety protocols followed during construction & maintenance.
Construction Protocols	Protocols followed for construction & maintenance.
Vehicle Database	Details of each vehicle.
Job Reports	Details of repair work carried out.
Equipment	Equipment inventory and details.
Maintenance Crew	Crew details in charge of maintenance.
Repair Materials	Material information and inventory.
Traffic Control Signs	Traffic Control Signs information and inventory.



EA ³ Cube Level/Thread	Artifact ID #	Artifact Name (* Composite Artifact)	Zachman Mapping	DODAF Mapping
Strategic Goals & Initiatives (I)	S-1	Strategic Plan*	C6/R1	AV-1
	S-2	SWOT Analysis	C5/R1	
	S-3	Concept of Operations Scenario		AV-1
	S-4	Concept of Operations Diagram	C2/R1	OV-1
	S-5	Balanced Scorecard™ *	C6/R4, C6/R5	
Business Products & Services (B)	B-1	Business Plan*	C2/R2, C5/R1	
	B-2	Node Connectivity Diagram	C3/R1	OV-2
	B-3	Swim Lane Process Diagram *	C4/R2	OV-5
	B-4	Business Process/Service Model	C2/R2	OV-5
	B-5	Business Process/ Product Matrix *	C4/R2	
	B-6	Use Case Narrative & Diagram	C6/R3, C6/R4	OV-6a, SV-10a
	B-7	Investment Business Case*		
Data & Information (D)	D-1	Knowledge Management Plan	C1/R1, C1/R2	
	D-2	Information Exchange Matrix*	C3/R2, C4/R2	OV-3
	D-3	Object State-Transition Diagram	C1/R3	OV-6b, SV-10b
	D-4	Object Event Sequence Diagram	C2/R2, C5/R3	OV-6c, SV-10c
	D-5	Logical Data Model	C1/R3	OV-7, SV-11
	D-6	Physical Data Model	C1/R4	
	D-7	Activity/Entity (CRUD) Matrix *	C1/R3, C4/R2	SV-9
	D-8	Data Dictionary / Object Library	C1/R5	AV-2
Systems & Applications (SA)	SA-1	System Interface Diagram	C3/R4, C3/R2	SV-1
	SA-2	System Communication Description	C2/R4, C3/R2	SV-2
	SA-3	System Interface Matrix *	C2/R4	SV-3
	SA-4	System Data Flow Diagram	C2/R3	SV-4
	SA-5	System Operations Matrix *	C2/R4	SV-5
	SA-6	Systems Data Exchange Matrix *	C2/R3	SV-6
	SA-7	System Performance Matrix *	C2/R3	SV-7
	SA-8	System Evolution Diagram	C2/R4	SV-8
	SA-9	Web Application Diagram	C2/R3	
Networks & Infrastructure (NI)	NI-1	Network Connectivity Diagram	C3/R5	
	NI-2	Network Inventory	C3/R5	
	NI-3	Capital Equipment Inventory	C3/R5	
	NI-4	Building Blueprints *	C3/R5	
	NI-5	Network Center Diagram	C3/R5	
	NI-6	Cable Plant Diagram	C3/R5	
	NI-7	Rack Elevation Diagram	C3/R5	
Security (SP)	SP-1	Security and Privacy Plan*	C4/R5	
	SP-2	Security Solutions Description	C4/R5	
	SP-3	System Accreditation Document*	C4/R5	
	SP-4	Continuity Of Operations Plan*	C4/R5	
	SP-5	Disaster Recovery Procedures *	C4/R5	
Standards (ST)	ST-1	Technical Standards Profile	C3/R4	TV-1
	ST-2	Technology Forecast	C3/R4	TV-2, SV-9
Workforce (W)	W-1	Workforce Plan*	C4/R1	OV-4
	W-2	Organization Chart	C4/R2	OV-4
	W-3	Knowledge and Skills Profile	C4/R3	OV-4

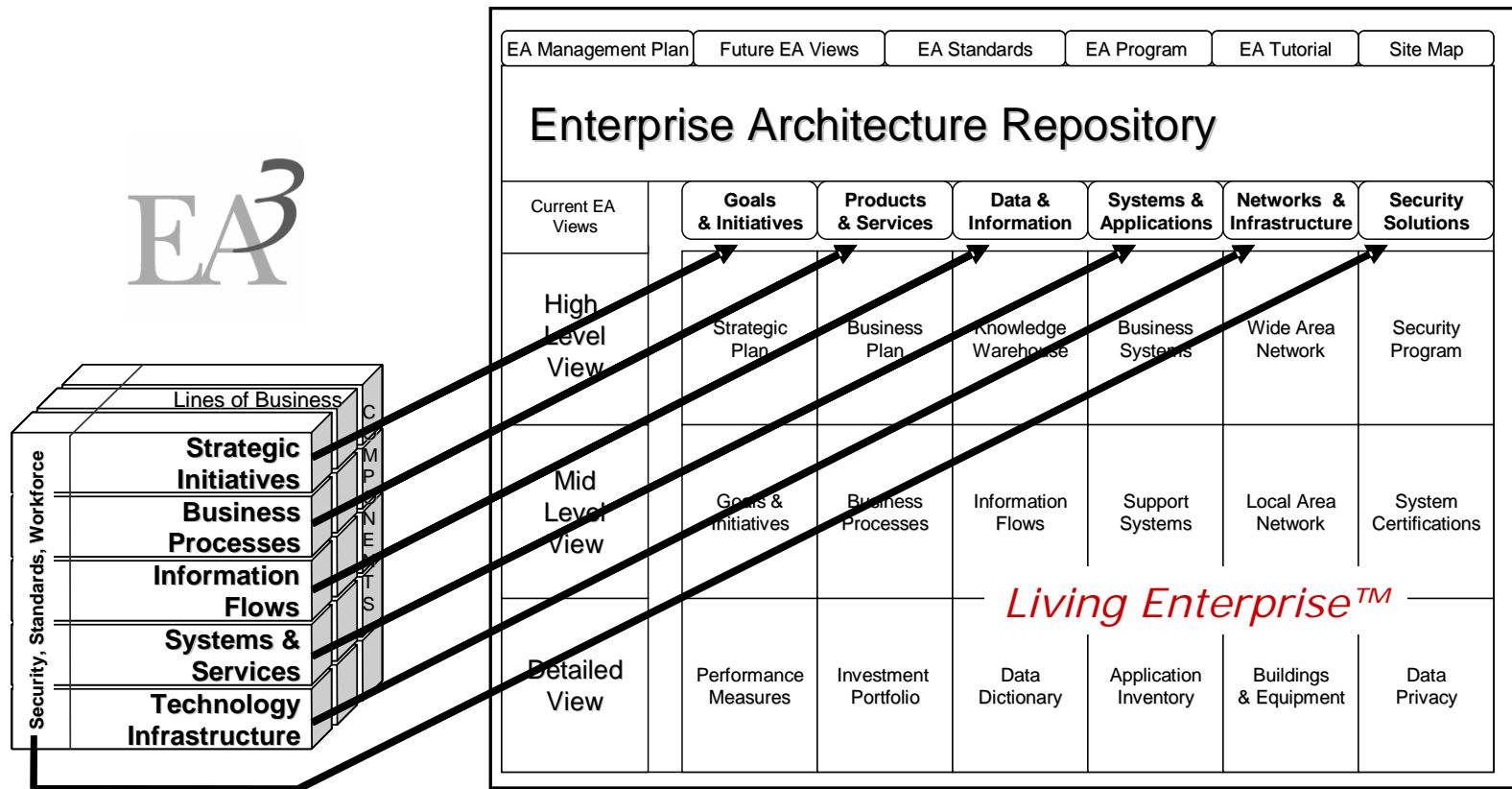


EA³

ID	Task Name	Duration	SYSTEM LEVEL SCHEDULE																		
			Quarter I	Quarter II	Quarter III	Quarter IV	Quarter I	Quarter II	Quarter III	Quarter IV	Quarter I	Quarter II	Quarter III	Quarter IV							
			JAN/FEB	MAR/APR	MAY	JUN	JUL/AUG	SEP	OCT/NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL/AUG	SEP	OCT/NOV	DEC	
1	Bridge & Road Repair	276 days																			
2	Highway Construction	194 days																			
3	Sign Painting	147 days																			
4	Traffic Painting	124 days																			
5	Fuel Management	267 days																			
6	Sign Works	262 days																			
7	Prevention Maintenance	262 days																			
8	Fuel Consumption	267 days																			
9	Parts Equipment Inventory	198 days																			

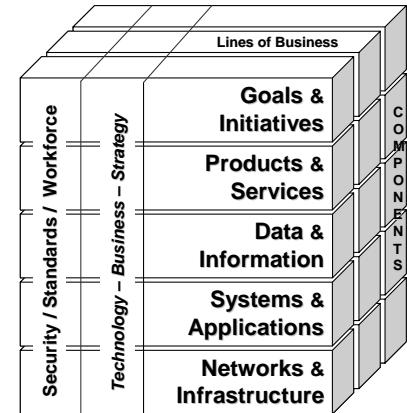
5 Elements of a Complete Approach – Repository

- The web-based EA repository should be designed to directly relate to the underlying documentation framework... *theory is applied.*



5 Elements of a Complete Approach – Best Practices

- An EA ‘Best Practice’ is a proven way to implement parts of the architecture at the strategic, business, or technology levels:
 - Strategic Level
 - Strategic Plan
 - Future Operating Scenarios
 - Balanced Scorecard™ Goals and Measures
 - Business Level
 - Business Plan (E-Commerce Plan / E-Gov Plan)
 - Business Requirements Use Cases
 - Business Case – Investment Portfolio
 - Business Process Management / BPI / BPR
 - Technology Level
 - Service Oriented Architecture
 - Object-Oriented Data Modeling & Application Dev.
 - Network-Centric Systems Engineering
 - Enterprise Resource Planning Systems
 - ANSI-SPARC 3-Level Data Architecture
 - System Development Lifecycles
 - Network Management Applications
 - Capability Maturity Model (CMMI)
 - Project Management



EA³

Part 3.

Do High-Quality Enterprise Architecture Work



High-Quality Enterprise Architecture Work

The characteristics of high-quality EA work includes:

Client

- Obtains desired outcomes
- Situational awareness maintained throughout project

Team

- Delivered what the client perceived as being valuable work
- Met cost, schedule, and performance goals
- Handled change effectively and professionally
- Knowledge transfer is supported when team members change
- Consistent, effective communication within team

Work

- Follows a recognized methodology, can be done by many architects
- Accurately depicts the enterprise's strategy, business, and technology
- Regular updates to documentation and repository
- Documentation is used by stakeholders throughout the enterprise

High-Quality Enterprise Architecture Work

The result of high-quality EA work is that:

- EA successfully integrates strategic planning, business planning, and technology planning... making the enterprise more **focused**.
- EA is the authoritative source for reference documentation / standards... making governance more **effective**.
- EA is a repeatable, scalable methodology... making the enterprise more **agile**.
- EA helps to manage and drive change, in alignment with strategic and business goals... making the enterprise more **successful**.

$$EA = S + B + T$$



Questions?