California
DEPARTMENT OF TECHNOLOGY

CA Enterprise Architecture Framework, Version 2.0 (CEAF 2.0)
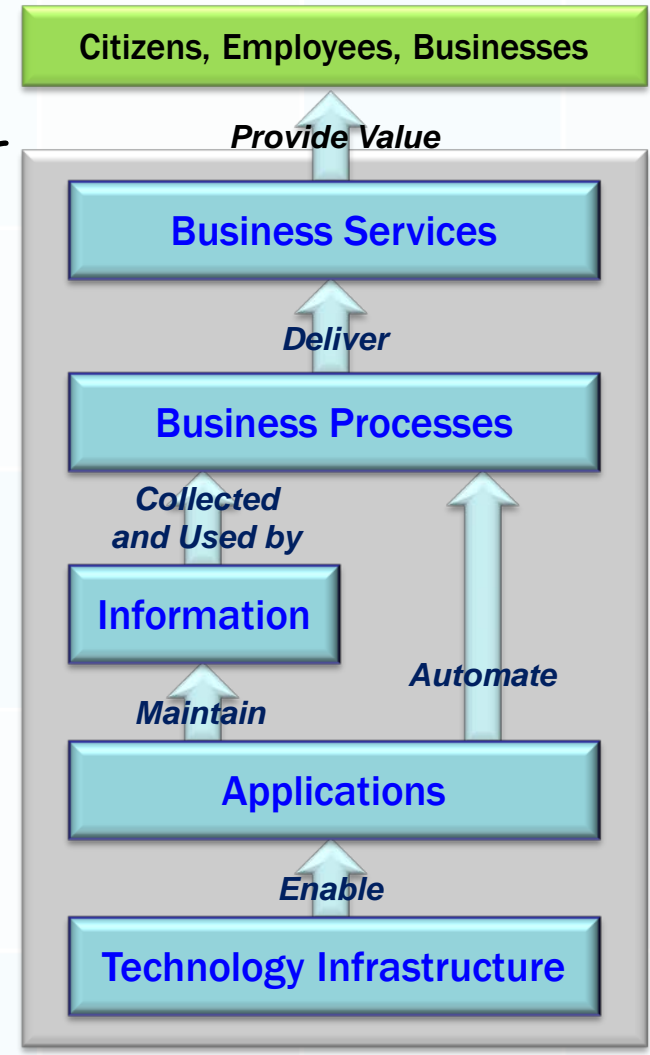
Overview

Topics

- **What is Enterprise Architecture (EA)?**

- **Why do we need EA?**

- **What is CEAF 2.0?**

- **California EA: CEAF 2.0 Strategy**

- **Components of CEAF 2.0**

- **Integrating CEAF 2.0**

What is Enterprise Architecture?

Enterprise Architecture (EA) **identifies** the business processes that execute or support an organization's mission and **defines** how Information Technology (IT) assets directly enable those processes.

The purpose of EA is to *optimize and transform* the often fragmented processes, information, application systems and technologies into an *efficient and integrated environment* supportive of the execution of *business strategy*.

Citizens, Employees, Businesses

Provide Value

Business Services

Deliver

Business Processes

Collected and Used by

Information

Maintain

Automate

Applications

Enable

Technology Infrastructure

Why do we need EA?

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➢ **To help identity all the opportunities and devise best possible strategies to achieve desired business outcomes**

- Identify new and efficient ways of using IT for strategic advantage
- Identity new or improved services the business can offer that are possible only because of the technology
- EA serves as the technology strategist for business

Vision, Mission, Operating Model

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Goals and Objectives Desired Business Outcomes

⬇

Business and IT Strategies

➢ **To define the desired Target State Architecture**

- Efficient and integrated environment to support business strategy
- Make the right technology decisions and set the right technology strategy
- Maximize advantage from IT to drive business performance

➢ **To help ensure investment decisions are aligned to business goals**

➢ **To define an Enterprise Roadmap to reach the target state**

➢ **To guide strategic projects ensuring architectural coherence**

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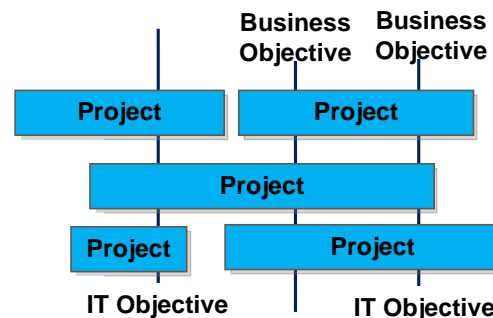
Citizens, Employees, Businesses

- Business Services
- Business Processes
- Information
- Applications
- Technology Infrastructure

Enterprise Roadmap

Business Objective   Business Objective

| Project | Project |

Project

| Project | Project |

IT Objective   IT Objective

FUTURE

Citizens, Employees, Businesses

- Business Services
- Business Processes
- Information
- Applications
- Technology Infrastructure

What is CEAF 2.0?

California Enterprise Architecture Framework, Version 2.0 (CEAF 2.0) guides effective implementation of EA within and across state agencies.

- Improves focus on *business-outcome-driven* EA deliverables

- Promotes *consistent* understanding of EA, its domains, and building blocks of each EA domain

- Provides a simple *metamodel* to support EA "models"

- Provides guidance for developing actionable EA deliverables and for effective EA governance

- Facilitates *uniform* implementation of EA programs through defined *EA services*

- Provides best-practice-based solutions to build reusable and shareable business and/or technical capabilities through *Reference Architectures*

California EA: CEAF 2.0 Strategy

Federated Approach

Progressive Approach

CEAF 2.0: Strategy

Focus on Business Benefits

Focus on Business Benefits

When implemented effectively, EA can enable many benefits. CEAF 2.0 guides effective implementation of EA.

Key benefits of EA	To realize the benefits, CEAF expands EA focus to:
Bridge the gap between strategy and implementation	▪ **Architect solutions** to achieve strategic business outcomes ▪ Help undertake projects within the context of **Target EA and Roadmap**
Improve alignment of IT with mission, goals, and objectives	▪ Create **an integrated view** linking mission and support processes to information, application and technologies
Improve business capabilities	▪ Identify **capabilities** to enhance and/or acquire ▪ Describe necessary **transformation through the Target EA**
Improve Interoperability and Information Sharing	▪ Build **Enterprise-wide** application integration, information integration, master data management, and access management **capabilities**
Reduce cost, cost of ownership, redundancy, duplication, complexity & risk	▪ **Limit technology diversity** while promoting controlled innovation ▪ Adopt **cross-agency repeatable/ shared solutions and platforms** ▪ Portfolio rationalization and simplification
Enable faster, simpler and cheaper procurement	▪ Use "**architect – invest – implement**" approach to procure in the context of **Target EA and Roadmap** ▪ Integrate **repeatable solutions and reusable assets**
Enable predictable success of transformation projects	▪ Triaged involvement in and **guidance** to transformation projects ▪ Ensure architectural coherence of **multi-vendor** and **multi-project** solutions

▪ **EA is an enabling function; benefits are indirect results of EA (***direct results of transformation projects***)**
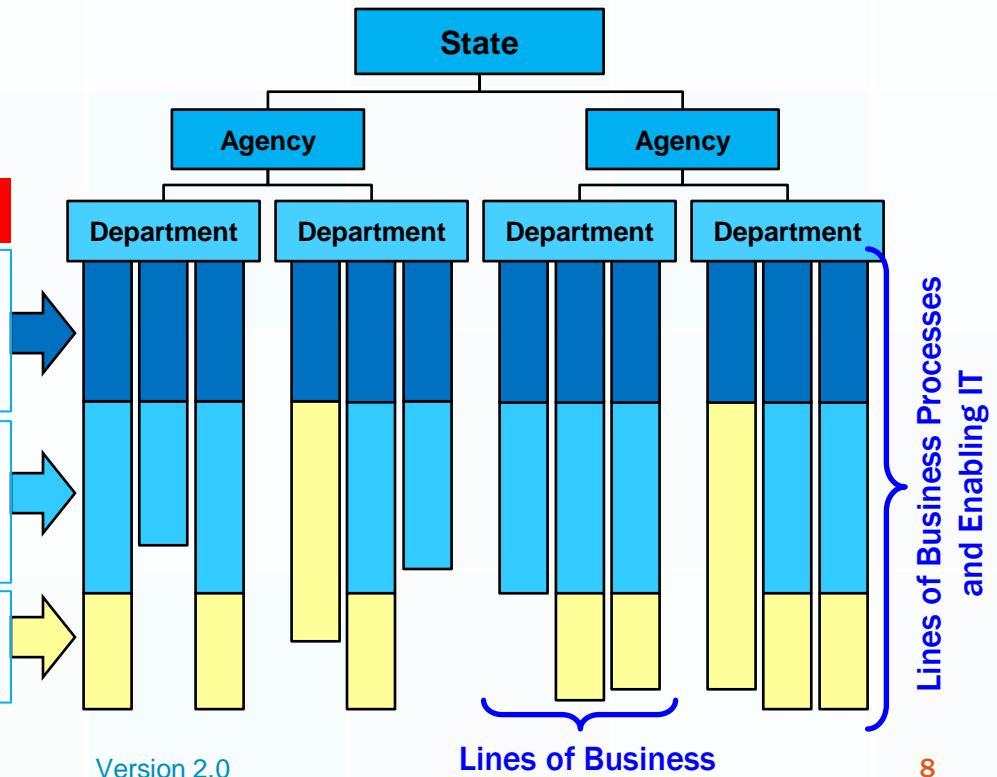
Federated Approach

Architectural

- ➢ **Core, Common, and Distinct Areas**
    - ▪ **Applicable to Business and IT**
- ➢ **Everything cannot be standardized, shared, or reused**
    - ▪ **Focus on *core and common areas* to build *reusable and shareable* capabilities at State, Agency, and Department levels**

Organizational

- ➢ **California enterprise is a *collection* of other enterprises**
    - ▪ **Each state entity is an enterprise**
- ➢ **California EA is an aggregation of state entity EAs**
    - ▪ **State entities are responsible to develop and use their EAs**
    - ▪ **State-level EA office provides guidance and leadership on sponsored Cross-Agency-Initiatives (CAIs)**

Area	Strategy
Core	▪ **Optimized Core Processes** ▪ **Standardized Enterprise Data** ▪ **Shareable Enterprise Systems**
Common	▪ **Repeatable Processes** ▪ **Standardized Solutions** ▪ **Repeatable/Shared Platforms**
Distinct	▪ **Business Unit Autonomy** ▪ **Standardized Technologies**

State

Agency — Agency

Department — Department — Department — Department

Lines of Business Processes and Enabling IT

Lines of Business

Progressive Approach

■ **Successful EA requires long-term focus**

■ **State- and agency-wide capabilities should be built a few at a time**

  ■ **Start with *core* and *common* capabilities**

    ■ e.g., Business Intelligence (BI), Enterprise Application Integration (EAI), Service-Oriented Architecture (SOA), Identity and Access Management (IdAM), Enterprise Content Management (ECM), eGovernment (eGov), Master Data Management (MDM), Cloud Computing (CC)

  ■ **Expand over time (core business segments, common platforms, enterprise solutions etc.)**

Planned EA Progression: Maturity Model
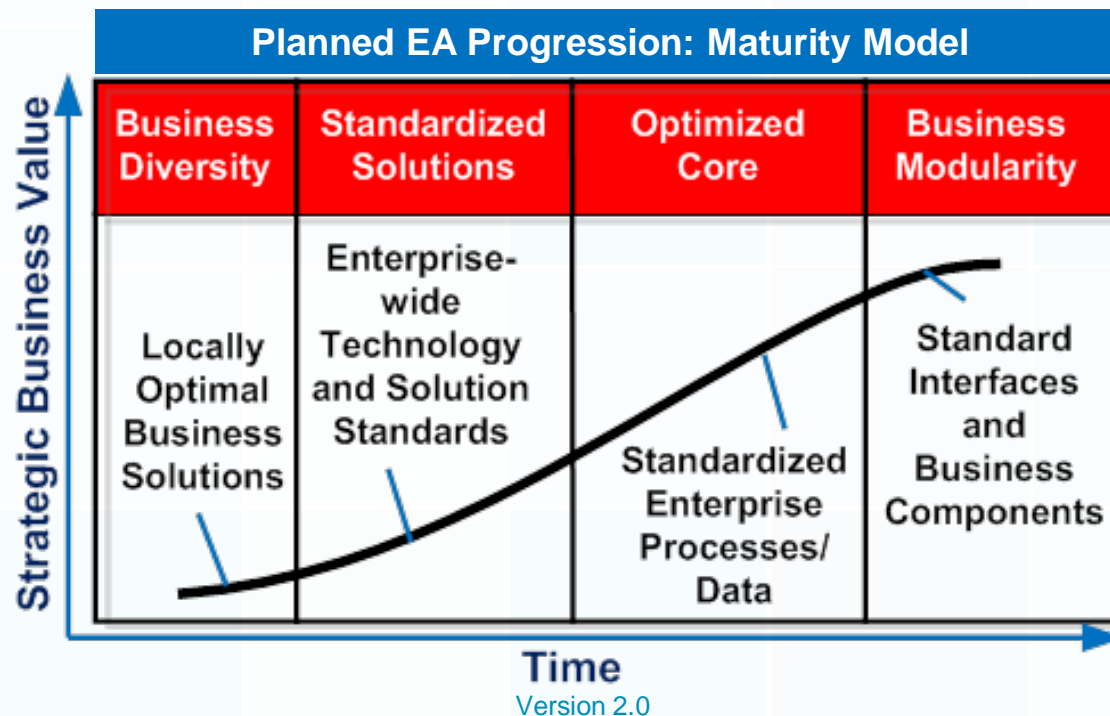
Three Main Components of CEAF 2.0
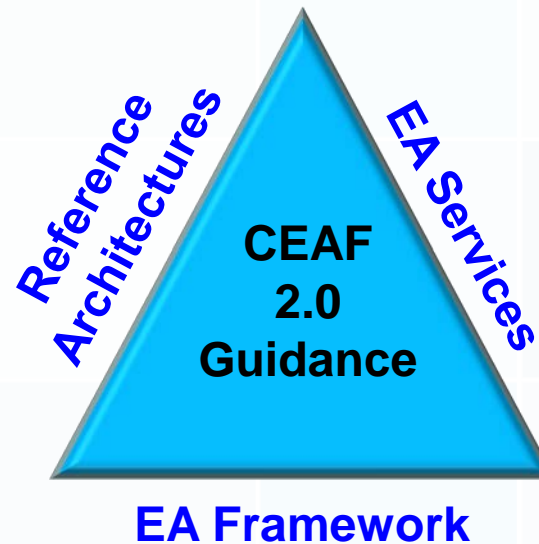
EA Framework

EA Framework
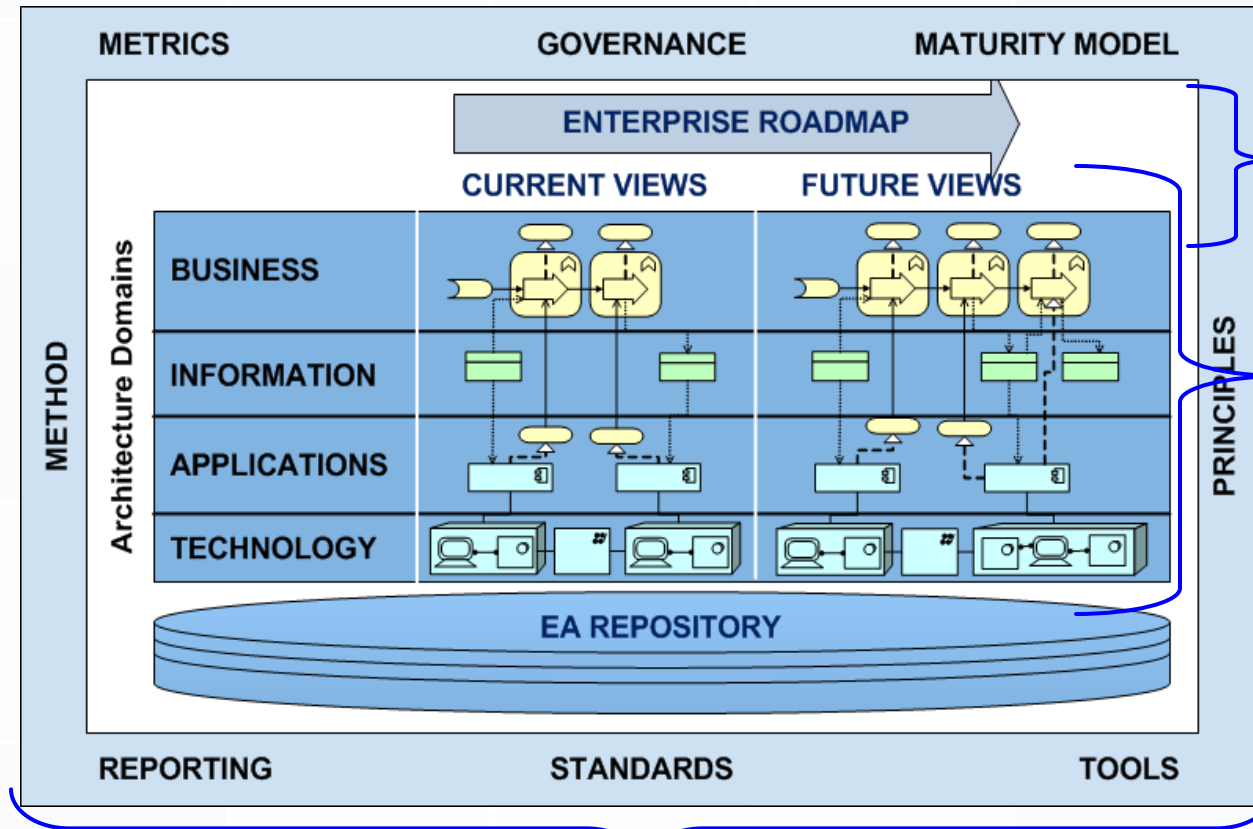
Focus on Actionable EA Deliverables
- **Target Enterprise Architecture**
- **Enterprise Roadmap**

Simple Content Metamodel
- **Based on ArchiMate**
- **31 Elements**
- **Allows Incremental Development**
- **Extensible**

EA deals with Business, Information, Applications, and Technology Architectures at a high level. Detailed BA, IA, AA, and TA are domain specific efforts.

Eight Core Features to Guide EA Development and Governance

- Cohesive adaption of best practices
- Compatible with FEAF, TOGAF, MITA etc.
- Covers the enterprise – not just technology

Content Metamodel Elements by Domain

Domain					
Motivation and Cross Domain Elements	Stakeholder	Driver	Assessment	Goal	Constraint
				Requirement	Principle
Business Architecture		Business Event	Business Service	Business Interface	Business Actor
	Business Object	Business Function	Business Process	Business Role	
Information Architecture	Data Object				
Applications Architecture		Application Service	Application Interaction	Application Interface	Application Collaboration
		Application Function		Application Component	
Technology Architecture	Artifact	Infrastructure Service	Infrastructure Interface	Communication Path	Network
		Infrastructure Function	Node	System Software	Device

- **Reference models (BRM, SRM, TRM etc.) are taxonomies; they themselves are not EA**

Reference Architectures

Best-practice-based solutions to build reusable and shareable IT capabilities:

- Provide the foundation to improve business capabilities
- Repeatable solutions possibly leading to shared solutions
- CEAF's strategy to progressively mature EA

- Reduce cost, risk, and time to delivery
- Improve State's ability to efficiently support IT – prevent dilution of talent pool
- Simplify decision making
- Improve communication and collaboration

Eight Reference Architectures available

Identity and Access Management

Enterprise Application Integration

eGovernment

Service-Oriented Architecture

Business Intelligence

Master Data Management

Enterprise Content Management

Cloud Computing
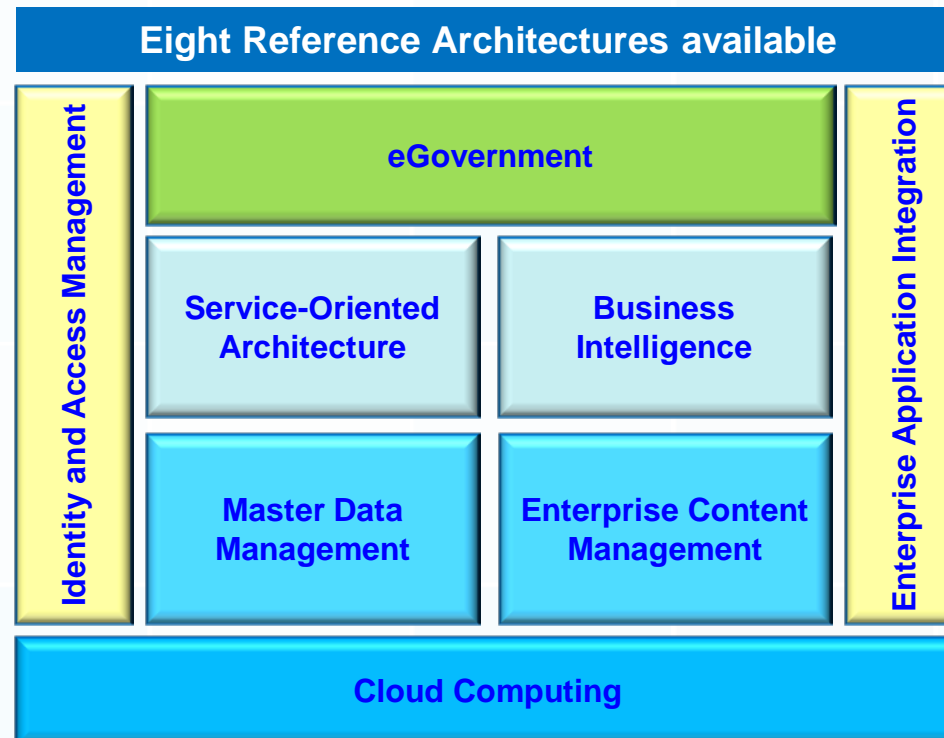
Value of RAs and Capability Focus: Example

With a combination of Reference Architectures (RAs), enterprise-level capabilities, appropriate approval processes, and governance, the following redundancies could have been reduced.

Example: Common architecture areas in large-scale State Projects									
Project	Budget	Infrastructure	IdAM	BI	MDM	SOA	EAI	ECM	eGov
FI$Cal	$616,805,644	✓	✓	✓		✓	✓	✓	✓
FTB EDR	$522,203,129	✓	✓	✓	✓	✓	✓	✓	✓
CalHEERS	$360,334,374	✓	✓	✓	✓	✓	✓		✓
SOMS	$416,278,521	✓	✓	✓		✓	✓	✓	✓
LRS	$475,590,753	✓	✓	✓		✓	✓		✓
BOE CROS	$269,417,990	✓	✓	✓		✓	✓		✓
CA MMIS	$458,591,056	✓	✓	✓	✓	✓	✓		✓
CWS-NS	$392,740,024	✓	✓	✓		✓	✓	✓	✓
CMIPS II	$423,658,970	✓	✓	✓		✓	✓		✓

Target Architecture Vision & Position of RAs

California Department of Technology

California's Customers (Citizens and Visitors, Business and Non-Profit, Government and Employees)

EDI | Service Integration | Payments | Fax | In-person | Phone | Mail | Mobile | Self Service | Web Portal | eForms

Security and Privacy (Audit, Compliance, Identity and Access Management)

Service Access and Delivery

- Internet, Intranet, Extranet, Other   - Perimeter Security, Authentication, Single Sign-On, Federated Single Sign-On

| Agency-level Internal and External Portals | State-level Internal and External Portals |

Business Process Portfolio

| Distinct Processes | Agency-level Common Processes | Agency-level Core Processes | State-level Common Processes | State-level Core Processes |

Applications Portfolio

| Special Purpose (COTS, Custom) | Standardized (BPM, BI, ECM, MDM, EDM) | Optimized Core (ERP, SaaS) | Multi-tenant Platforms (BPM, BI, ECM, MDM, EDM) | Shared Enterprise Systems (ERP, SaaS) |

Shared Services and Integration

| Enterprise Application Integration Platform (ESB, EAI, EDI, API, EBO) | Enterprise Information Integration Platform (EBO, DaaS) | Enterprise Application Integration Platform (ESB, EAI, EDI, API, EBO) | Enterprise Information Integration Platform (EBO, DaaS) |

| Shared Services (Business and Technical) | Shared Services (Business and Technical) |

Information Sources (Customer-Centric Information Views)

| Service Registry | Analytical | Transactional | Unstructured | Master Data | Service Registry | Analytical | Transactional | Unstructured | Master Data |

Technology Infrastructure

| Legacy and Special Purpose Application Platforms | Platform-as-a-Service |

| Legacy Infrastructure (Rationalized) | Infrastructure-as-a-Service |

Agency-level Optimization and Sharing   State-level Optimization and Sharing

EA Services

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1) Assist with Business and IT Strategies

Vision, Mission, Operating Model

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Goals and Objectives Desired Business Outcomes

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Business and IT Strategies

2) Portfolio Rationalization

3) Target EA and Roadmap Development

4) Standards Establishment and Governance

5) Assist with Project Prioritization

6) Assist with Concept and Business Case

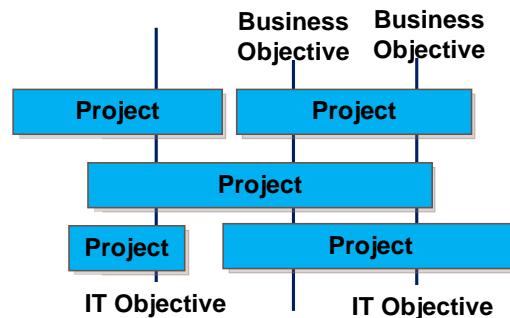## CURRENT

Citizens, Employees, Businesses

- Business Services
- Business Processes
- Information
- Applications
- Technology Infrastructure

Enterprise Roadmap

Business Objective   Business Objective

Project   Project

Project

Project   Project

IT Objective   IT Objective

FUTURE

Citizens, Employees, Businesses

- Business Services
- Business Processes
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- Applications
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7) Architecture Guidance & Oversight to Projects

8) Harvest Reference Architectures and Reusable Assets

Integrating CEAF 2.0

Collaborative Planning

Reviews with Capability Perspective
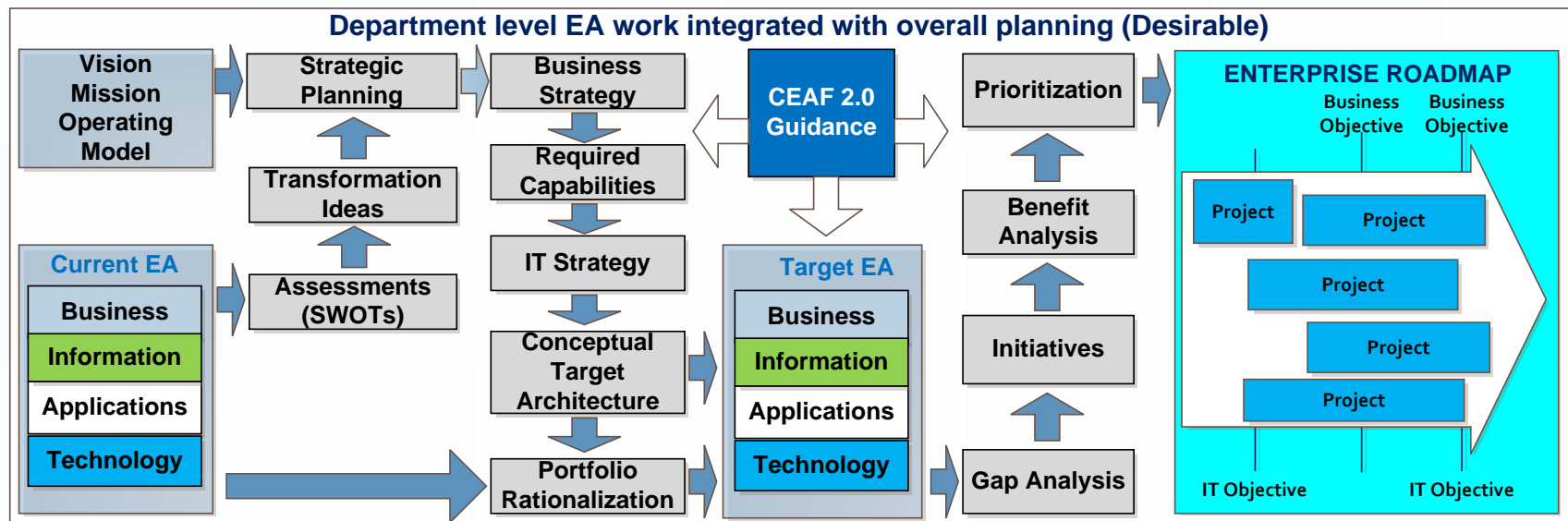
Integrating CEAF 2.0

Project Guidance and Oversight

Collaborative Planning

Target EA and Roadmap are essential to realize EA benefits; to build them, EA activities must be integrated into overall planning.

Department level EA work integrated with overall planning (Desirable)

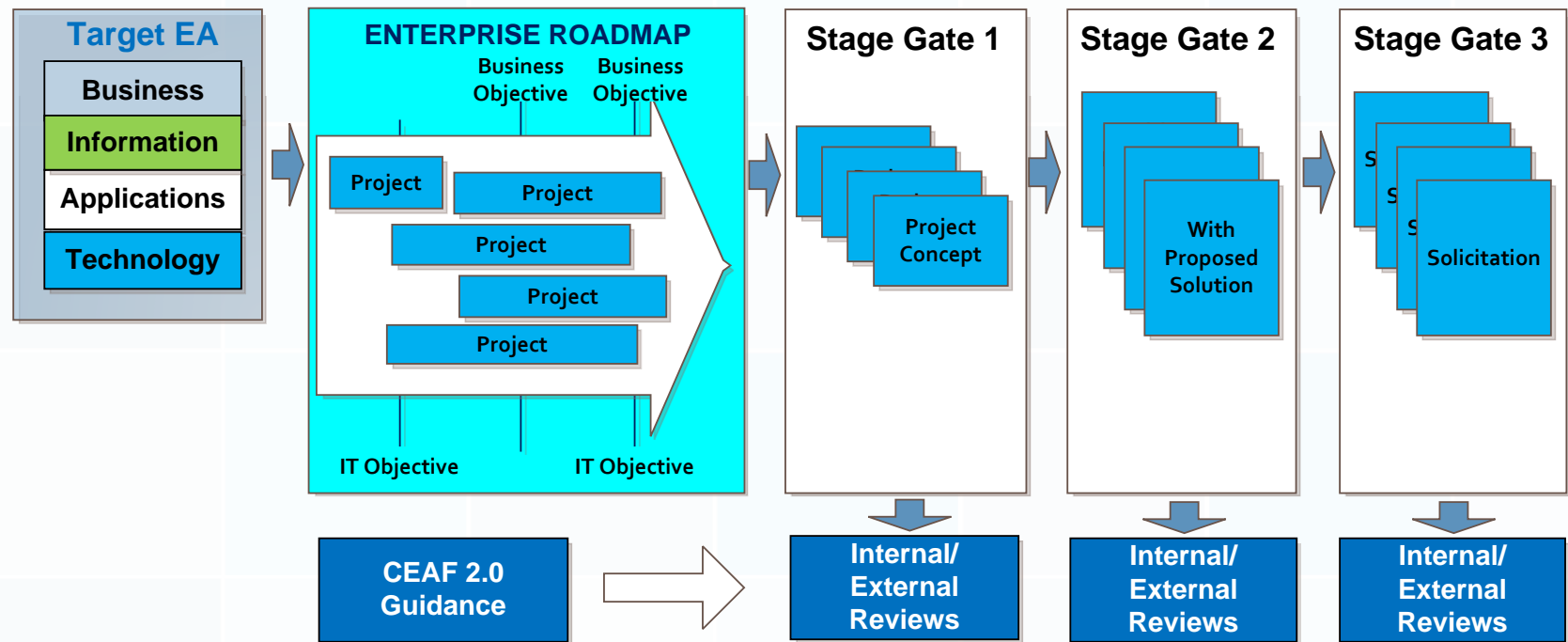## EA integration into overall planning is important to:

- Communicate transformation ideas
- Advise business leaders on how IT can support business transformation
- Bridge strategy and implementation gap
- Influence adoption of reusable and shareable solutions
- Create necessary agility and flexibility

Enterprise Roadmaps are important to:

- Ensure projects are aligned to strategic goals and Target EA
- Ensure required capabilities are being built with enterprise perspective
- Reduce inter- and intra-agency duplication
- Ensure architectural coherence
- Ensure projects have clear objectives, can succeed, and can deliver long-term value

Reviews with Capability Perspective

Project approval life cycle is a key mechanism to enforce state strategy and perspective to progressively build/reuse core/common capabilities.

Target EA
Business
Information
Applications
Technology

ENTERPRISE ROADMAP

Business Objective — Business Objective

Project — Project — Project — Project — Project

IT Objective — IT Objective

CEAF 2.0 Guidance

Stage Gate 1 — Project Concept — Internal/External Reviews

Stage Gate 2 — With Proposed Solution — Internal/External Reviews

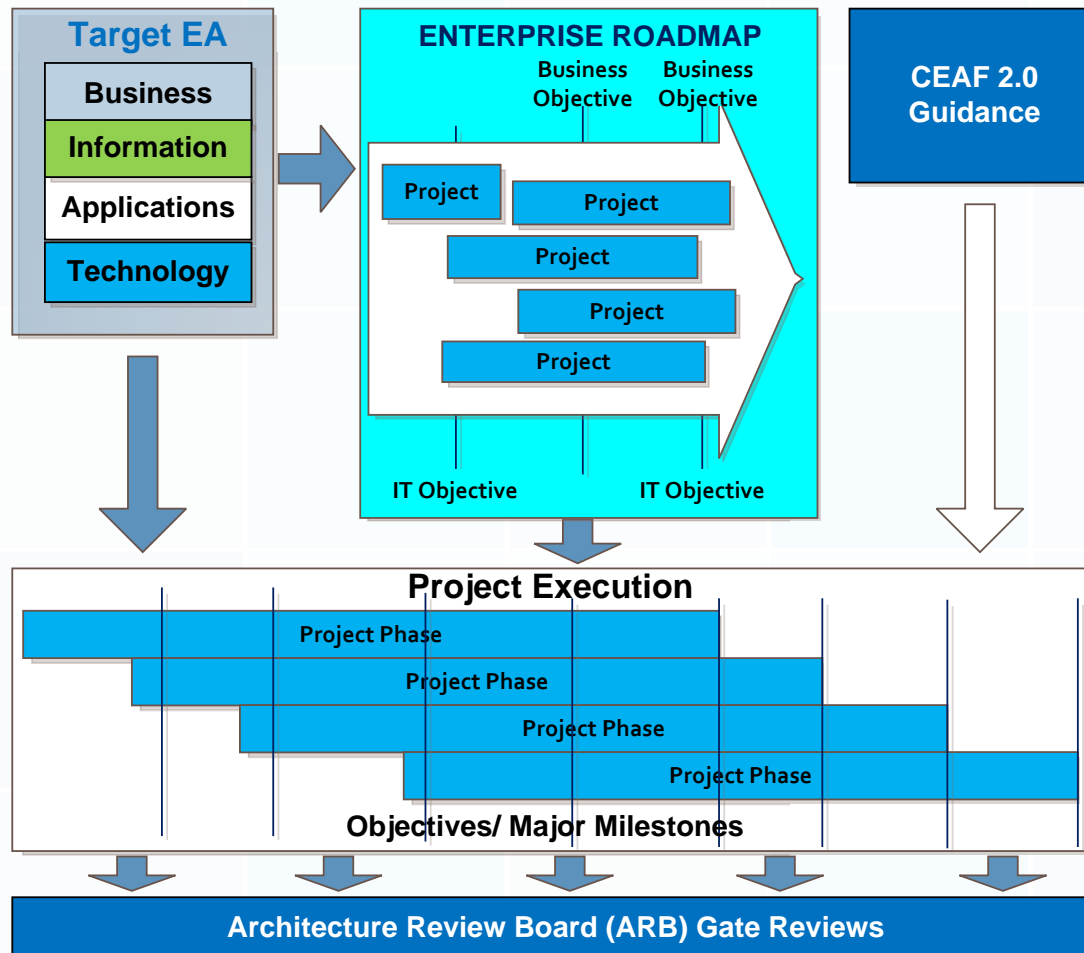**Stage Gate 3** — Solicitation — Internal/External Reviews

- Reviews in the Context of Target EA and Roadmap
- Help identify core capabilities for reuse, sharing or repeatability
- Help identify new capabilities for future RA work

- Ensure proposed solution is described and confined
- Ensure available standards and RAs are integrated

- Ensure project life cycle alignment to the nature of the project
- Incremental achievement of objectives
- Sufficient requirements to control architectural diversity

Project Guidance and Oversight

Enterprise context, project architecture, and planning are critical to enhancing project success; this requires expanding architectural guidance and oversight.

Target EA

- Business
- Information
- Applications
- Technology

ENTERPRISE ROADMAP

Business Objective   Business Objective

- Project
- Project
- Project
- Project
- Project

IT Objective   IT Objective

CEAF 2.0 Guidance

Architect's involvement in planning is important:

- Most projects are technically complex
- Technical planning is a critical component of project planning
- Project planning is not just an aggregation of tasks; it is an integrated execution plan

Project Execution

- Project Phase
- Project Phase
- Project Phase
- Project Phase

Objectives/ Major Milestones

Architecture Review Board (ARB) Gate Reviews

Architecture guidance and oversight from enterprise perspective is important to:

- Ensure progress towards target EA
- Provide timely guidance
- Ensure coherence of multi-project and multi-vendor solutions
- Maintain capability focus

Next Steps

- **Consensus-based Framework Enforcement**
  - **Business-outcome-driven Metrics**
  - **Goal-oriented Reporting**
- **Integration with Investment Control and Project Oversight**
  - **Investment Reviews in the Context of Enterprise Roadmaps**
  - **Control Technical Diversity during Procurement**
  - **Oversight Integration through Architecture Review Boards**
- **Capability Development**
  - **Promote Data Center Capabilities based on RAs**
  - **Improve Collaboration through Communities of Interest (COI)**

Thank You