California Enterprise Architecture Framework Program

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1   Executive Summary

Enterprise Architecture (EA) programs are an organizations route planning body for business and technology change. Effective programs are structured with a necessary set of criteria that provide both optimal and useful results to the organizations that they support in achieving the change. Straying from these criteria may lead to unexpected and value-deficit activities that render the program to be no more than organizational noise[1]. This document describes California's Enterprise Architecture Framework (CEAF) Program and provides the minimum criteria needed to structure your Department's EA program to align with the framework.

1.1   EA Programs Explained

An informed program is accomplished through an implementation methodology that is maintained by structured management and a collection of consultative analysis and design services to varying levels of scope. Together they provide an ongoing and action-oriented capability set to departments/agencies. For example, the program can coordinate perspectives (views) of an organization's strategic direction, business services, information flows, and resource utilization across the enterprise, business segment, program, and project scope. As a management program staff generally focus on[2]:

- Strategic Alignment – Integrating goals, activities, and resources.
- Decision Support – Operational investments and management.
- Resource Oversight – Lifecycle approach to development and management.
- Standardization Policy – Resource governance and implementation.

Programs should be technologically unbiased and view the organization holistically. As an analysis and design method staff generally focus on:

- An Approach – The framework, analysis/design method, and artifact set.
- Current Views – As-is strategies, processes, and resources.
- Future Views – To-be strategies, processes, and resources.
- EA Management Plan – A plan to move desired scope from current to future state.

1.1.1   Statewide EA Program

The Office of Enterprise Architecture (OEA) resides within the Government Operations Agency's Department of Technology. The OEA leads the California's EA practice, in tandem with enterprise-level strategic planning that guides state entities through business, information, and technology changes necessary to execute strategy and achieve business objectives. The OEA is a strategic business planner and leader in

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[1] California Enterprise Architecture Framework Digest, Section 1.4
[2] Bernard, Scott. An Introduction to Enterprise Architecture., 2012

formulating and identifying operational opportunities that advance business and technology to effectively deliver innovative citizen-centric solutions.

The OEA's responsibilities include:

- **Business Transformation Consultation** – Strategic planning and analysis of organization purpose, goals, objectives, and current and future business value(s). This guides operational decisions that progress state business to achieve expected business-outcome-driven, measurable results.
- **Technology Modernization Consultation** – Guide analysis and evaluation of sustainable technology infrastructure, applications, and services that enable state entities to effectively support client/citizen-centric business strategy.

- **Enterprise Architecture Oversight** – Oversee the CEAF that includes statewide program alignment and cross-program architecture principles, guidelines and patterns for sound architecture design. Objectivity of the CEAF and the OEA's oversight role ensures that delivered systems are fit and sound for their internal purpose and produce business, social, financial, and customer value.

Additionally, the OEA's leadership of California's Enterprise Architect Community (EAC) facilitates the socialization and reuse of pragmatic and constructive EA methods.

The program strives to establish cohesive and consistent practices and methods that enable better information technology (IT) decisions driven by the state's business needs in the delivery of state government services. A cohesive state program better positions the IT community to support cross-program initiatives and services that better serve Californians.

1.1.2 Department-Level EA Program

Department and agency programs are in a unique position to provide analysis of business and IT capabilities, architectural components, and processes to inform transformative strategies for the enterprise. Transformation sponsors within the organization, in turn must provide support for the establishment and operations of an EA program for the program to be of greatest value.

Programs should be disciplined, methodical and analytical teams trained to identify patterns, themes, capabilities, and maturity levels of organizational components (strategic, business, and technology), for the purposes of informing service delivery and transformation decisions.

Programs provide services that enable mission success with:

- Being the single source of truth for information about organization business processes, information flows, and technology capabilities, and the relationships between them.
- Reducing total cost of ownership, time to delivery, and operational duplication.
- Assisting to decrease debt of IT investments and organization resources.

Herein provides foundational understanding of the elements essential to run a productive program that can inform the optimization and transformation efforts of your organization. The resulting efficient and integrated environment will better support your department's business strategy.

In the absence of a dedicated team with a strategic lens on the enterprise, departments are more likely to engage in stovepipe or siloed implementations, which will increase operational inefficiencies, resource duplication, and operating costs.

2   Introduction

The CEAF Program, enhances upon prior versions of CEAF, based on the practical lessons learned from both the implementation and the evolution of EA in industry and government. The goal is to mature programs from focusing on monolithic technology consolidation and current state inventories, to enabling business capabilities and business outcomes through iterative management consultancy engagements - one project or one slice of the organization at a time. Herein this is referred to as architectural scope.

2.1   Background

California's EA journey started in 2003 with the establishment of Policy and directive to collect IT inventories in the hopes of consolidating and establishing statewide IT standards. During 2004 and 2005, the community performed extensive research in enterprise architecture including major vendor and department presentations as well as work completed by the California Performance Review[3] and other state and federal agencies. As a result, the first CEAF was released on July 15, 2005 and then modified in August 2013. The framework, indicated in Table 1, is evolving to incorporate lessons learned as departments/agencies use it to implement EA programs and apply its practical methods.

EA has evolved over the years; from traditional "boil the ocean" to a process and taxonomy focused framework, to as of recent, a more pragmatic/less idealistic business-outcome-driven focus. CEAF strives to apply EA capability services and methods iteratively and repeatedly through a management consultancy format to promote institutional learning.

Table 1: CEAF Version Focus

Focus Area	CEAF 2020 (Iterative Business Transformation)	CEAF 2013 (Business Capability Foundation & Enablement)	CEAF 2005 (Technology Consolidation)
Deliverables and Services	• Actionable and scope focused to inform design decisions	• Business-outcome-driven EA deliverables • Defined EA Services	• As-is Reference Models (data collection & categorization) • Ad hoc Artifacts
IT Portfolio Planning and Stewardship	• Portfolio Rationalization • Digital Innovation Opportunities • Target Roadmap for Scope	• Portfolio Rationalization • Target EA and Enterprise Roadmap • Advancing SOA	• Infrastructure and Technology Standardization

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[3] Legislative Analyst's Office https://lao.ca.gov/2004/cpr/082704_cpr_review_ov.htm

Focus Area	CEAF 2020 (Iterative Business Transformation)	CEAF 2013 (Business Capability Foundation & Enablement)	CEAF 2005 (Technology Consolidation)
Business Enablement	• Business Capability Centric	• Business Capability Centric	• Technology Centric
Project Engagement	• Consulting Engagements	• Triaged Involvement	• Mandated Oversight
Skills	• Human Centered Design Thinking • Cross-Functional Hybrid Skills • Institutional Learning	• Cross Functional Hybrid Skills	• Domain & Platform Expertise

2.2 Purpose

Programs should strive to maximize organizational value. To do this, program criteria include at minimum: principles, method(s), tools, standards, governance, metrics, reporting, and a maturity path to guide, support, and govern the development of actionable work products.

2.3 Intended Audience

The primary audience for this document is California state employees building an EA program or striving to enhance an existing one. Additionally, those who create architectures and roadmaps, are strategic thinkers, provide EA services, and/or choose to follow EA methods will benefit. State employees involved in the planning, approval, execution and oversight of state programs, and private industry who support these activities, may also benefit from the framework details.

2.4 Document Organization

The CEAF is comprised of four (4) core building blocks:

A. California Enterprise Architecture Framework Digest

B. California Enterprise Architecture Framework Program (this document)

> • **Section 1 Executive Summary** provides an overview of enterprise architecture programs, their expected benefits, suggested organizational structure and role.

- **Section 2 Introduction** provides a background of California's statewide enterprise architecture program and practice, its purpose, intended audience, and the organization of framework content.
- **Section 3 Program Implementation Strategy** provides a vision of the California EA community and necessary program components.
- **Section 4 Appendix** provides decision-maker relationships with EA groups.
- **Section 5 Glossary of Terms** provides a list and definition of commonly used EA terms.

C. California Enterprise Architecture Framework Portfolio

D. California Enterprise Architecture Framework Views

2.4.1 Future Directions

The statewide program will be progressively refined based on the lessons learned from its practice and use and is based on the progression of program maturity. Below are some topics being considered for future revisions:

- Additional guidelines that support EA Programs, Capabilities and Common Business Scenarios for which programs provide services.
- EA Community Contributions.

2.4.2 Deferred Decisions

Modifications to State EA Policy(s) that foster and support the further establishment of department/agency EA programs and the elevation of some responsibilities and methods in strategic and business transformation planning processes.

3   Program Implementation Strategy

EA programs have great potential to be highly valued management program areas. This implementation strategy is arranged with minimal structure that, with sponsorship, will return qualitative value within the organization. Each section below contains an "*ACTION"* that briefly describes work to be performed to support the program. The actions should be exercised and modified to complement program need.

Developing and sustaining a comprehensive architecture of your department/agency can be a complex process, due to the breadth and depth of the analysis and design, communication, and integrated management processes. It involves many stakeholders and decision processes within the organization. Working within the confines of a sponsored and chartered program will greatly increase success.

3.1   EA Community Vision

The program implementation strategy guides cohesive and consistent methods for the implementation of your department's program by replicating the CEAF framework. The strategy is designed to answer the *who, what, how, where,* of a department's program. Alternatively, CEAF is alignment friendly should your program implement differently. The statewide repository, along with consistent practice methods and participation in the Community will foster this alignment. Further details about the repository can be found in the CEAF Portfolio[4] and in the statewide repository[5].

Your program maturity informs the minimum program components that can or should be addressed for the greatest value. Upon continuous reassessment, your department/agency may rework implementations to achieve the next level of program maturity and so forth, until the highest optimal maturity is achieved for your program.

3.2   Program Maturity & Assessment

ACTION: Periodically measure the progress, maturity, and effectiveness of your program, and refine as necessary to ensure the program's value-add maintains or increases its contributions to the organization.

As your department builds and grows its EA program, it is important to strive for continuous improvement by assessing the program's capability maturity. By leveraging an assessment approach and process, departments can identify strengths and weaknesses within its programs and adjust them accordingly. Assessments and models provide organizations with a common benchmark for planning and measuring its efforts for program improvement, and a means for consistent program activities enterprise wide.

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[4] California Enterprise Architecture Framework Portfolio
[5] EA Communities Forum (Repository)

Building a successful program is a process worked on and developed over time. As your program improves, you will see the benefit of increased program value to the organization and in turn increased trust from executives and decision-makers.

An immature program may depend on ad hoc practices, weak governance and stakeholder engagement, and poor alignment to business needs. If your program is newly established and primarily focused on reacting to issues and "fighting fires", do not expect your program to immediately deliver work focused on forward thinking, planning, and innovating.

A mature program demands responsibilities for both ensuring "business as usual" and delivering business innovations. As a program matures, it may introduce formally defined steps, managed quality and outcome metrics, and active optimization of its processes. Although not guaranteed, programs that adopt mature practices are likely to operate efficiently and effectively and achieve desired business outcomes on a repeatable basis.

In tandem with program maturity, is the maturity of the organization's enterprise architecture, or tangible architecture designs. Both the program and organization's architecture maturity are intimately intertwined. As the program capabilities mature, the tangible architecture will naturally mature as a result. EA maturity models allow organizations to evaluate its current position and better understand the right timing and approach for architecture transitions. Both program and architecture models offer structured levels that describe how the behaviors, practices and processes of an enterprise can be improved over time to increase maturity. Models can also be used as a benchmark for comparison with other enterprises and aid in the understanding of how to make improvements.

Further information regarding program maturity can be referenced in the statewide repository[6].

3.3 Program Components

Programs should perform, at minimum, the following key activities which will provide salient points for establishing an enterprise architecture. Minimum requirements and activities of the program include:

3.3.1 People

ACTION: Establish a permanent team or identify staff that together can formulate a virtual EA group, who can work together to create a comprehensive future state architecture of your organization and future state program capabilities. This is also known as the organization's EA Plan.

To facilitate a consistent and uniform implementation of EA methods across the state, CEAF recommends programs establish dedicated teams and charter them to provide

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[6] EA Communities Forum (Repository)

clearly defined services, deliver consistent and reusable work products, and foster EA methods and community collaboration. These dedicated/virtual groups strive to communicate a common understanding of EA and organizational domain/business segment components.

Programs with multiple architects are in a better position to deliver the anticipated organizational values described in this framework than in organizations where a single architect is assigned the EA title. Combining strengths and weaknesses of multiple architects round out your program with different focus expertise. For example – assembling a team of architects with broad understanding of strategy, business and technology but also encouraged to specialize in strategic planning, business process framework(s), solution design, security architecture, and data/information management is a complementary and highly valuable place to start.

3.3.2 Program Compatibility to a Framework

ACTION: Identify a framework that complements your program's ability to create a comprehensive architecture of your organization over time. These can be custom-made and/or designed around common internal services such as business processes.

Such frameworks refer to processes, or methods which inform how to create and use an enterprise architecture. Public and private sector framework use is plentiful. Examples include FEAF[7], TOGAF[8], and Zachman[9]. Some frameworks are designed to support a multitude of enterprises in multiple industries and include comprehensive methods and guidance for specific endeavors (i.e.: system development). Other frameworks are intended to simplify the initiation of an EA program. And some frameworks provide generic or sector-specific taxonomies. Requiring or enforcing a single framework is not a concern for CEAF, as each department should have the flexibility to choose the best fit framework for their needs, or they can custom-blend practices from multiple frameworks. It is not necessary to be restricted to a single framework if a hybrid or blended framework is appropriate.

CEAF is designed to meet the specific needs of California state entities. Consequently, your chosen framework should foster characteristics of your program's ability to be:

- Comprehensive – Cover aspects of an agency through current and future views of the strategic, business, information, application systems, and technology areas while supporting incremental development through lines of business, segments or domains, and projects.
- Integrated – Provide a mechanism (e.g., meta model) to identify relationships among organizational domains for business, information, application systems, and technology and their alignment to the organization's overall mission and strategic goals.

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[7] Federal Enterprise Architecture Framework
[8] The Open Group Framework
[9] Zachman

- Scalable – Support architecture practices at various organizational levels and scopes (e.g., state, agency, cross-program initiative, line of business, segment, and solution).
- Flexible – Provide the flexibility to support architecture practices using a business-driven approach, which is recommended. Or an approach that is initially driven by the need to improve IT efficiencies and standardization to enable teams to start small, demonstrate the value of sound EA, gain executive support, and expand over time.
- Consistent – Standards and best practice-based solutions (such as Reference Models) provide a base to build common business and/or technical capabilities, and other reusable assets to create effective and comparable target designs.

3.3.3 EA Services

ACTION: Define a core set of EA services cognizant of program and staff maturity, for which architects can provide value. Of the many capabilities in the CEAF, identify, augment, and create the services that best fit your organization's needs.

To facilitate consistent and uniform implementation of statewide EA methods, CEAF recommends that departments charter their programs to first prioritize, and then engage in these general services as their program maturity allows:

- Assist with Business and IT Strategy.
- Application/Service Portfolio Rationalization.
- Future State Planning and Actionable Roadmap Development.
- Realignment of Misguided In-Work Efforts.
- Assist with Project Prioritization to help Drive Business Forward and Improve Program Outcomes.
- Assist with Concept and Business Case Development.
- Standards Establishment and Governance.
- Solution Architecture Guidance and Oversight.
- Develop Reference Models and Reusable Assets.

Tools, templates, and guiding materials that support these services are available in the statewide repository[10]. Detailed explanation of state-level EA capabilities can be referenced in the California Enterprise Architecture Framework Portfolio[11].

3.3.4 Principles

ACTION: Define a set of principles, enterprise-level requirements and constraints for your program work and organization's architecture. Consider including caveats to enforce the concept that delivery requires support.

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[10] EA Communities Forum (Repository)
[11] CEAF Portfolio

EA is most effectively practiced when it is based on guiding principles during the analysis and design work that form the basis of architecture projects.

CEAF promotes the following six principles to serve as a guide for program work. These principles represent some criteria against which potential investment and decisions are weighed.

Table 2: CEAF Principles

Principle	Principle Description
Principle 1: Business Drives Information Technology	Rationale – Human-centered design thinking must drive technology direction. Business events represent the essential activities that define the boundaries of a good IT environment. Without knowing the business, IT may be over- or under- built, resulting in excessive complexity, cost, delays and/or gaps. This principle fosters a culture where the information environment changes in response to business needs, rather than business changing in response to information technology, thereby making it easier to identify technical impacts when business events change. Implications – • Recognize and start with consumer and business perspectives in the design process. • Minimize unintended effects on business due to IT changes. • Build what business needs, not what IT wants. • Apply human-centered design methods and use consumer experiential journeys to drive business needs.

Principle	Principle Description
Principle 2: Enterprise Awareness of Common Business Solutions	Rationale – Consider the impact and maximize the benefit to the whole enterprise in information management decisions. Decisions made from an enterprise perspective have greater long-term value than decisions made from a project perspective that only benefit individual organization segments. Duplicative solutions are expensive and proliferate conflicting data and data representations. Implications – • Integrated management that supports enterprise investment decision-making is important to being enterprise aware. • Application components should be shared across organizational boundaries. Organization segments should be discouraged from developing solutions for their own use that are similar or duplicative of a statewide solution or to that of similar or duplicative solutions within the same Agency and/or Department. In this way, expenditures of scarce resources to develop essentially the same capability in marginally different ways will be reduced. • Changes to legislation and government code to guide separate departments to act in a unified manner. • Achieving maximum enterprise benefit requires changes to the planning and management of information. Technology alone cannot bring about this change. • Some organization segments may have to concede their own preferences for the greater benefit of the enterprise. • Information management initiatives should align to statewide direction; they should conform to the blueprints and priorities established by the State. • A common technology and organization infrastructure will need to support common business solutions.

Principle	Principle Description
Principle 3: Common Design and Analysis	Rationale – EA is most effectively practiced in a common way at all levels of scope when based on common principles that guide the design and analysis work of projects. Design and analysis principles in strategy, business, and technology serve as a guide for programs and projects. Implications – Strategy • Enterprise IT strategy and an enterprise roadmap should be developed in close coordination with broader agency strategic planning efforts to ensure alignment of automation information management processes and investments with overall organization priority. • Specify enterprise-wide information sharing, and protection policies. Business • Organization business activities exist to meet strategic objectives are thoughtful and streamlined. • Services should be standardized within and between business lines and/or agencies where possible. Technology • Technology assets are more likely shared, implementation architectures are reused, investments are intentional and deliberate.

Principle	Principle Description
Principle 4: Ease-of-Use	Rationale – Ease-of-use is a positive incentive for application use and promotes the actor's ability to concentrate on tasks at hand. It encourages people to work within their provided environment instead of developing isolated workarounds to accomplish tasks outside of it. Keep underlying technology transparent and training about the technology to a minimum; people will be more productive. Implications – • Focus on human-centered design methods. • Require applications to have a common look-and-feel and support ergonomic and ADA requirements. • Applications should leverage standard reference models and required capabilities and should be implemented following proven implementation patterns for improved maintainability. • Actor interaction guidelines should not be constrained by narrow assumptions. Factors such as language, customer physical infirmities (visual acuity, ability to use keyboard/mouse), and technology proficiency have broad ramifications in determining an applications ease-of-use.

Principle	Principle Description
Principle 5: Control Technology Diversity	Rationale – Compliance with IT Agency direction to facilitate interoperability and consistency across solutions. Common technologies across the enterprise brings the benefits of economies of scale. Use of proven technology will simplify software design, reduce application development time, facilitate learning, improve systems maintenance, and support, and promote information-sharing among organizations, and thus reduce total cost of ownership. Limiting the number of supported components will simplify maintainability and reduce costs. The business advantages of minimum technical diversity include standard packaging of components; predictable implementation impact; predictable valuations and returns; utility status; and increased flexibility to accommodate technological advancements. Technical administration and support costs are better controlled when limited resources can focus on shared technology sets. Implications – • Setting, reviewing, and revising standards periodically, and granting exceptions. The process must be sufficiently agile to support business and design drivers. • Adhere to standards unless there is a compelling business reason to implement or support a non-standard solution. • Tie IT policy and procedures directly to this principle. • Fewer products and configurations simplify the IT environment. • The target architecture must be used in conjunction with the organization's investment review process and IT operations plans. Relying on the architecture as an integral component of IT decision making helps control the introduction of incompatible products. • Tie policies, standards, and procedures that govern acquisition of technology directly to this principle. • Technology choices will be constrained to availability within the technology blueprint. • The technology baseline cannot be frozen. Technology innovation will change the technology blueprint when compatibility with the current infrastructure, improvement in operational efficiency, or a required capability has been identified.

Principle	Principle Description
Principle 6: Secure Information and Comply with Laws	Rationale – Enterprise information will be secure from unauthorized access, modification, or destruction. With increasing threats to state systems, the State has a responsibility to maintain the public trust in its services by protecting these systems and protecting data integrity, confidentiality, and privacy. Enterprise information management processes comply with all relevant laws, policies, and regulations. Statewide policy is to abide by laws, policies, and regulations. This will not preclude business process improvements that may require or lead to changes in policies and regulations. Implications – • Identify and design security into IT of every business process from the beginning; adding security later is expensive, time-consuming, and unreliable. • Identify, publish, and keep applicable policies current. • Ensure security and privacy considerations enable, not impede, business. • Safeguard information against inadvertent or unauthorized alteration, sabotage, disaster, and disclosure. Compromised information could result in the loss of public trust. • Comply with laws, regulations, and external policies regarding the collection, retention, and management of data. Changes in the law and/or regulations may drive changes in processes or applications.

3.3.5 Methods (Techniques, Artifacts and Standards)

ACTION: Select and formalize effective analysis and design methods, tools, and guiding artifacts that consistently help you to drive and constrain scope.

The CEAF recommends chartered programs to at minimum:

- Analyze the business strategy and goals and understand the business operating model.
- Divide the enterprise architecture into segments and prioritize the work across these segments to incrementally develop the organizational architecture in accordance with the business priorities. Segmentation is usually accomplished through projects or an organization's functional units, rather than entire organization-wide domains.
- Determine target maturity levels across segments to support the business operating model and long-term business strategy. This is usually accomplished

one segment or project at a time, rather than through entire organization-wide domains.
- Apply best-practice-based solutions to build common business and/or technical capabilities.

Tools, templates, and guiding materials used to perform these activities are available in the statewide repository[12] and the California Enterprise Architecture Framework Portfolio[13].

3.3.5.1 Alignment to Federal Collaborative Planning Methodology

The CEAF adopts portions of the Collaborative Planning Methodology (CPM)[14] described in the Common Approach to Federal Enterprise Architecture[15] which is designed to support integrated planning, implementation, and measurement activities. It should be noted that the phases and steps encompass the overall planning and implementation at the enterprise level while allowing flexibility to tailor and integrate a detailed methodology. For example, your tailored, detailed architecture development methodology can include work such as analyzing the current state, determining adjustments, and planning the future state.

3.3.5.2 Power Tools

Eventually EA programs are faced with problems beyond the capabilities of general office productivity tools. Typical challenges include:

- Managing many artifacts.
- Capturing complex relationships between many elements across those artifacts.
- Performing gap analysis, impact analysis, scenario planning and modeling.
- Presenting appropriate information to stakeholders to support planning and decision-making.

Professional grade tools designed to address these challenges support your documentation and analysis activities. When used properly, they contribute to improved business outcomes by capturing, integrating, analyzing, and communicating information to strategically guide decisions. Consider these features when you select tools for use within your program:

- Visual representation support for standard business, information, applications and technology views and their relationships and ability to decompose the overall architecture and specific architectures into these views.
- Modeling capabilities, which support architecture views including business process models, physical and logical models of information and applications, and physical and logical models of infrastructure, networks, and cloud environments.

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[12] EA Communities Forum (Repository)
[13] CEAF Portfolio
[14] CPM
[15] Common Approach to Federal Enterprise Architecture

- Support for ArchiMate or similar modeling concepts and notation.
- Configurability capabilities that are extensive, simple, and straightforward to accomplish, while providing flexibility to modify the content meta model.
- Ability to link to strategic goals and transformation projects.
- Decision analysis capabilities, such as gap analysis, impact analysis, scenario planning and enterprise system thinking.
- Presentation capabilities, which are visual and/or interactive to meet the information needs of stakeholders to support planning and decision-making.
- Administration capabilities, which enable security, user management and other tasks, preferably in conjunction with the enterprise identity and access management system.
- Usability, including intuitive, flexible, and easy-to-learn interfaces. Web-based viewing capabilities are preferable.
- Built-in repository, configuration management and quality standards.

The EA Community has had experience with various tools. Visit the discussion board in the "EA Community" forum[16] for more information about EA tools.

3.3.5.3   Standards

Standards can apply to technology design as well as supporting processes with implications to technology. For example, common business process models with impacts to application development may require a standard framework to maintain a comprehensive, consistent, and accurate architecture view.

Design standards apply to all areas of an EA program and are essential to achieving interoperability and resource optimization through common methods for analysis, design, documentation, and reporting. Without standards, models and analyses will struggle to make "likewise comparisons" between capabilities, services, systems, lines of business, and organizations.

In addition to the applicable standards from leading bodies, including but not limited to the National Institute of Science and Technology (NIST), the Institute of Electrical and Electronics Engineers (IEEE), the International Organization for Standardization (ISO), and the European Committee on Standardization (CEN), you may develop additional standards to augment these standards. The EA Community appreciates your sharing these standards on the EA Community Forum so that all state entities can benefit from them.

The CEAF contain guidelines and best practices from which departments/agencies can benefit from and may include content meta models, reference models, implementation and information technology patterns, and other standards. See the California Enterprise Architecture Framework Views[17] for further information.

EA models and diagrams are important standardization elements. They describe all or parts of an enterprise architecture and provide hierarchical views of the organization

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[16] EA Community Forum
[17] CEAF Views

and/or lines of business that can be examined from several perspectives. Standardizing on a modeling language may be a valuable consideration for some programs.

3.3.6 Repository

ACTION: Create a repository, or echo the statewide repository, for the organization of artifacts. Example artifacts are work products, reference materials, models and diagrams, guides, and tools. It is suggested that state entities establish a repository content management process before the program begins populating it to avoid impeding its integrity.

The repository is intended to provide a single place for storing and accessing artifacts. Ideally artifacts are created using EA tools, however many artifacts may be custom developed for particular use. A repository works best if it is easy to access and use, and the repository structure should facilitate the management of artifacts. California's EA repository is available for reference and contribution in the EA Community Forum[18].

The framework recommends the repository at minimum provide:

- A methodical structure that promotes the practice of EA thinking and teams (Note: The statewide repository is structured after the FEAF "EA Cube"[19]).
- "Read" access to organization staff.
- Firm artifact owner, editor, and librarian role assignments.

3.4 Program Responsibilities in Governance

ACTION: Identify the planning, decision-making, and oversight processes and people that influence how the scope is developed, verified, versioned, used, and sustained over time. This is conducted with respect to measures of completeness, consistency, coherence, and accuracy from the stakeholder perspective. Where possible, your program should participate in the organization's integrated management process as a vital contributor.

Program responsibilities include recommendations to:

- Structure for the development and management of a department's EA work.
- Structure for the development and management of cross-program initiatives.
- A framework and support for initiatives, policies, standards, and related processes.

Stakeholder roles in enterprise architecture are described in the Appendix Section 4.3 Decision-Maker Roles & Relationship with EAs.

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[18] EA Community Forum
[19] EA Cube

3.4.1 Standards Development Process

ACTION: Develop a workflow for which your program can accept, process, and inform decisions surrounding architectural change. Communicate your desire to partner with stakeholders to deliver the IT support they need. Remain unbiased and offer constructive proposals that will meet business needs.

The following example describes a simplistic, principle-driven process for developing and maintaining standards and corresponding roles and responsibilities:

- Researching Status - An area for a new EA standard or modification to an existing standard is identified through several mechanisms including unexpected external forces, industry trends or technology advancements, executive direction, stakeholder requests, or other forums. Preliminary research is performed and a determination if the standard should be pursued or not is reached.
- Proposed Status - The program forms a working group and develops a draft standard and supporting documentation.
- Review Status - The proposed standard is then reviewed by the department/agency governance body and policy group (if the standard is identified to be enforced through policy).
- Approved Status - When the governance body approves the standard. Otherwise, the above two steps are repeated until the standard is approved or rejected. An approved standard should be communicated to everyone who need be made aware of the standard.
- Publish Status - The standard is published through department/agency Policy processes.

3.4.2 Waivers

Many organizations exercise governance processes when augmenting standards. Your program may opt to institute a "waiver" in the standards development process. A waiver is valuable to programs when following research and proposal steps where risks or recommendations to not proceed are disregarded by superior groups or stakeholders. Waivers can provide historical documentation of the analysis, recommendation, and rationale of decisions and its implications. Your program will want to file, maintain, and revisit these waivers for future consideration and/or repair.

3.4.3 Reporting

ACTION: Develop and regularly communicate your target EA plan including its incremental/scaled approach, and gain stakeholder buy-in. Use a framework that provides effective EA governance that complements your organization. These aspects will progress your program value from "Noise" to "Influential" as explained in the CA Enterprise Architecture Framework Digest[20], Section 1.4 Organization Placement of EA.

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[20] CEAF Digest

Program reporting is important for maintaining an understanding of current and future capabilities. Providing a repository of architecture artifacts, plans, solutions, and other information is not enough for effective reporting. Periodic reporting on capabilities, options and progression of the organization's architecture and the program producing it, in a standardized way, is important to demonstrate value and sustain support for the program.

Examples of effective reporting can be based on EA services, outcomes that matter to decision-makers, requirements of project approvals and governance. Reporting should integrate with internal program communications.

Reporting elements to consider are:

- An Annual EA Plan, detailing how the overall organizational architecture aligns and informs Strategic Plans.
- Potential Digital Innovation Opportunities.
- Marketing of EA Services to Project Sponsors.
- Enterprise Roadmap (partial, complete for a segment, or complete for the organization).
- Project Consultation work products and Outcome Presentations.
- EA Program Maturity Scorecard.
- Business Process Maturity Scorecard.
- Portfolio Rationalization Results.
- Catalog of Reusable Services and Assets.
- Technology Standards Matrices.
- Candidate Reference and Implementation Models.

Outlets to reporting may be existing leadership, project, and team meetings. Enrichment and education of your deliverables and outcomes to organizational teams, is essential to increasing your program value.

3.4.4 Value Metrics

ACTION: Position your impact on business outcomes in terms of your influence on which transformation projects are identified, initiated, and how these transformation projects are directed in alignment with the target state and roadmap.

One of the top challenges for programs and practitioners is demonstrating the business value of EA to the organization.

Most programs and practitioners focus metrics on operational activities which measure business value in terms of EA activities or "*doing EA*". For example, simply being busy performing work or producing artifacts does not denote value. Effective and valued programs communicate and demonstrate their value by focusing on how they enable the organization to meet business outcomes that matter to decision-makers. The difficulty in communicating and demonstrating EA value in terms of business outcomes arises from the fact that these business outcomes are achieved by the transformation projects rather than by EA directly. EA's impact on business outcomes is indirect and

business value metrics that communicate and demonstrate the value of EA is an "enabler" of business outcomes.

Organizations with successful programs often say that "Because of EA I was able to…." These types of statements confirm that an EA program is achieving its desired value and is positively impacting stakeholders.

4 Appendix

4.1 Decision-Maker Roles & Relationship with EAs

State Chief Information Officer (SCIO)

Theoretically is the senior advisor to the Governor with full responsibility and authority for statewide technology vision, strategic planning and coordination, technology policies and standards for secure technology solutions, technology architecture, technology implementation, project management and defining a streamlined technology project review and approval process.

Role within Enterprise Architecture

- Provides strategic direction to the Office of Enterprise Architecture.
- Advocates information technology stakeholders (Agency heads, Legislature, Governor's office) on enterprise architecture benefits.
- Markets enterprise architecture benefits via collaborative forums.
- Obtains participatory commitment from state executives.
- Leads the California Information Technology Executive Council (ITEC) and Technology Operations Advisory Council (TOAC).
- In collaboration with ITEC, decides which statewide initiatives to undertake and selects an Executive Sponsor for those initiatives.
- Approves all enterprise architecture policies.

Information Technology Executive Council (ITEC) and Technology Operations Advisory Council (TOAC)

ITEC and TOAC advise the SCIO on matters related to information technology in the California Executive Branch, including the development of statewide technology strategic plans and the adoption of enterprise-wide information technology standards and policies.

Role in Enterprise Architecture

- May charter the Enterprise Architecture Community participation.
- Ensures alignment with the California State Technology Strategic Plan.
- Identifies policy gaps and recommends areas for enterprise architecture policy development and/or standards.
- May review statewide enterprise architecture policies.

Composition of ITEC and TOAC membership represent stakeholders in the Executive Branch's IT community, including stakeholders from several constitutional offices, the state's support agencies, Agency Information Officers, departmental Chief Information Officers, the judiciary, and local governments.

State Office of Enterprise Architecture (OEA)

The OEA is responsible for the California enterprise architecture framework, processes, reference models, investment reviews for alignment to statewide architecture standards and vision, and the EA Community.

<u>Role in Enterprise Architecture</u>

- Create, maintain, and socialize the California Enterprise Architecture Framework, Principles, Methods and Statewide EA Repository.
- Create and maintain statewide EA-related Policies.
- Educate California Enterprise Architecture Framework, Methods and Policies.
- Lead the EAC and facilitate adoption of California Enterprise Architecture Framework, Methods and Policies.
- Facilitate creation and maintenance of reference models and reusable assets.
- Serve as state's lead advisor on Enterprise Architecture and applicable Information Technology Initiatives.
- Facilitates statewide architectural collaboration through the EAC and other communities of interest.
- May lead architecture development for cross-agency/cross-program initiatives.

Enterprise Architecture Community (EAC)

The EAC promotes the CEAF and strives to execute statewide enterprise architecture framework alignment that promote comparable architectures and design method consistency across California state entities. The EAC aims to be influential in informing change and enabling mission success with a lower total cost of ownership, faster time to delivery, and reduced duplication. The EAC participants manage their respective department/agency enterprise architecture program, however, as a community strive to make California's IT landscape more efficient. Members are statewide and consist of architects, IT, and business subject matter experts.

<u>Role in Enterprise Architecture</u>

- Review and present enterprise architecture work products for community collaboration and education.
- Provide experiences of professional methods, techniques, and tools.
- Support and promote alignment to CEAF and policies within their own department/agency.
- Serve as a conduit for collaboration with the EAC to identify improvements to CEAF based on lessons learned and experiences.
- Assist with the creation of statewide EA policies.
- Perform internal reviews of EA policies and revisions thereof.
- Present EA-related policies to and coordinate reviews with the EAC.

Communities of Interest (COI)

The COIs are volunteer groups of architects and other information technology and business subject matter experts that have common interest in an area which may include an architecture domain, standard or reference models, segment, line of business or initiative.

COIs collaborate on architecture areas including best practices and lessons learned to help advance that architecture area so all state agencies can benefit from it.

Role in Enterprise Architecture

- Work with EAC or subset of EAC members on specific architecture areas.
- Help advance an enterprise architecture area through collaboration, so all state departments can benefit from those advancements.

Department/Agency Architecture Review Board (ARB)

ARBs review enterprise architecture work products and ensure that work is completed to achieve the organization's strategic-level goals and architecture vision. They should also monitor the organization's transformation projects to ensure the solution and domain architectures are aligned with the target enterprise architecture and applicable standards.

Role in Enterprise Architecture

The Department/Agency Architect may include these responsibilities:

- Manage the EA Program.
- Coordinate the organization's architecture projects.
- Chair the Department ARB.
- Ensure the Department ARB contains members with appropriate skill sets depending on architecture need.
- Promote alignment to CEAF and its methods including applicable reference models in the organization.
- Collaborate with the OEA to expand reference models, methods, and other reusable assets, so all state entities can benefit from them.
- Support the department/agency EA program and intergroup collaboration.

Multi-Disciplinary Team (MDT)

MDTs are generally composed of staff in various roles and with various skill sets brought together for an architectural purpose. MDT size depends on the mission scope, size, and complexity of the architecture. Key roles often include the Enterprise Architect, Business Architect, Solution Architect, and other Domain Architects. Other IT and business subject matter experts assist this team in one or more specific technologies and/or business processes. Together they solve problems and research opportunities however the work of the team should be organized and led by the EA program or architect.

Role in Enterprise Architecture

MDTs responsibilities may include:

- Develop the needed architecture work products.
- Work with executives, managers, and subject matter experts to identify scoped requirements and enterprise-level architectural solutions.
- Collaborate with stakeholders and other architects to create, improve, or re-engineer business processes. Act as the primary interface between business leaders and the architecture team.

- Serve as a conduit to communicate business needs and goals to the MDT and architecture capabilities to improve business processes and program outcomes to the business leaders.
- Work collaboratively with stakeholders and other architects to create detailed solutions to meet business and technical requirements for a specific program, project, or initiative.
- Coordinate with the MDT and collaborate with stakeholders to perform analysis and provide designs in their domains (e.g., Data, Technology, Infrastructure, Security).
- Although not directly part of the architecture team, subject matter experts contribute to the MDT deliverables by providing expertise to the team in one or more specific technologies and/or business processes.

5   Glossary of Terms

Applications Architecture	Applications Architecture is a blueprint for structuring and deploying application systems and in accordance with business goals, other organizational frameworks and all core business processes.
Architectural Scope	Organizational components included in or impacted by the work's view in regard to relevance to the future state architecture.
Architecture Views / CEAF Views	An architectural view is a representation of one or more aspects of an architecture that illustrates how the architecture addresses the concerns held by one or more of its stakeholders.
As Is Enterprise Architecture	Same as Current State Enterprise Architecture
Business Architecture	Business Architecture includes information on business strategy, governance, organization and how to adapt any existing processes within the organization.
CDT	California Department of Technology
CEAF	California Enterprise Architecture Framework
COI	Communities of Interest
Current State Enterprise Architecture	AS IS Enterprise Architecture that represents an organization's architecture in its current state.
Domain	Segments or layers of an enterprise architecture. Typical domains are Business, Information/Data, Systems/Applications, Technology/Infrastructure, and Security.
EA	Enterprise Architecture is the practice of analyzing, designing, planning, and implementing enterprise analysis to successfully execute on business strategies. Enterprise Architecture is a comprehensive operational framework that explores all an organizations functional area while defining how technology benefits and serves the organization's overall mission. The technological aspect of EA defines the hardware, operating systems, programming, and networking solutions a business employs and how those may be used to achieve its current and future objectives.
EA Plan	An EA plan is the blueprint for defining architecture in support of the business, and the plan for implementing this architecture.

EA Practice	May refer to a formal EA Program, but may also refer to an informal group of EA Practitioners.
EA Practitioner	A person actively engaged in performing EA work, but not necessary an Enterprise Architect. For example, a business analysis may perform EA work within the Business Architecture domain.
EA Program	An EA program is an organization's plan of action aimed at accomplishing a clear Enterprise Architecture objective, with details on what work is to be done, by whom, when, and what means, or resources will be used.
EAC	Enterprise Architecture Community
Enterprise	A business or company made of the organization(s), stakeholders, and culture.
Enterprise Architect	An Enterprise Architect is an enterprise architecture specialist that works closely with stakeholders, including management and subject matter experts, to develop a view of an organization's strategy, information, processes, and IT assets. An EA is responsible for using this knowledge to ensure IT and business alignment. An Enterprise Architect connects an organization's business mission, methodology and processes to its IT strategy and established in-depth documentation with the help of an array of architectural models, or views, which provide a picture of how an organization's existing and future requirements may be accomplished in an effective, agile, sustainable and flexible manner.
Enterprise Roadmap	An Enterprise Architecture Roadmap is a ordered sequence of EA initiatives that are required in order to make the transition from the current enterprise Architecture baseline to the future target Enterprise Architecture vision.
Framework	A logical structure for classifying and organizing complex information [Federal Enterprise Architecture Framework].
FEAF	Federal Enterprise Architecture Framework
Future State Enterprise Architecture	To-be Enterprise Architecture that represents an organization's architecture in its desired future state. Intentional change can be achieved through future state architectures that effectively align strategies and goals with your IT capabilities.
ITEC	Information Technology Executive Council
NASCIO	National Association of State Chief Information Officers

OEA	CA Department of Technology, Office of Enterprise Architecture
Organizational Scope	The scope that the architecture is addressing. For example, enterprise, segment, line of business, etc.
Program Maturity	An assessment of an EA program's capability level.
Segment / Organization Segments, Lines of Business	Segment architecture drives decisions for a business case or group of business cases supporting a core mission area or common or shared service.
Target Enterprise Architecture	Same as Future State Enterprise Architecture
TOAC	Technology Operations Advisory Council
TOGAF	The Open Group Architecture Framework is a framework for enterprise architecture that provides an approach for designing, planning, implementing, and governing an enterprise information technology architecture.
Views	The ability to see something from a specific vantage point.
Viewpoint	The position from which a view is observed. A viewpoint is a collection of patterns, templates, and conventions for constructing one type of view.
Zachman	The Zachman Framework is an enterprise ontology and is a fundamental structure for Enterprise Architecture which provides a formal and structured way of viewing and defining an enterprise.