California
DEPARTMENT OF TECHNOLOGY

California Enterprise Architecture Framework Views

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1 Executive Summary

Enterprise Architecture (EA) program architects rely on graphical models and diagrams, herein known as views, as fundamental resources to manage and communicate an organization's architectural concepts. They are essential since stakeholder perspectives vary depending on their goal orientation and respective viewpoints. Architects use them to manage the abstraction of a model so that relevant and information conversations with stakeholder can take place. EA provides comprehensive views of current capabilities and resources, as well as a set of plausible future operating scenarios to review needed changes in processes and resources. This document introduces the California Enterprise Architecture Framework (CEAF) Views that include an overview of the purpose of current and future state architecture views, organization domain focused views and architectural patterns and themes in business-driven solution design.

1.1 Purpose of Views and Viewpoints

Views are documented representations that present a perspective from a viewpoint or unique position. Views are usually graphics that depict multiple aspects of architecture components in a simplified or more attractive format.

Integrated and consistent EA views of strategic goals, mission and support services, and information, and systems, together enable the organization's business. Current views provide key inputs to strategic planning processes in terms of current strengths, weaknesses, opportunities, and threats. They enable organization-wide consistent understanding of program and service performance and opportunities to improve performance. Future views incorporate thorough analysis of opportunities and resulting solutions to improve program and service performance in accordance with the strategic goals and desired business outcomes. It provides the context and can be the source of standards for all levels of interoperability, for reuse of solutions and shared service models.

Regularly updated information provides decision-makers with near real-time access to various levels of architectural detail. For this purpose, EA programs that are integrated into the organization's internal management structure have direct links to other organizational areas of resources, (i.e.: project management, security, capital planning), and decision-makers can obtain coordinated information on operations, support, and development activities. The enterprise architect is the primary role to formulate and present these views.

1.2 Benefits of Graphical Language

Communicating through graphical language (i.e.: models and diagrams) can help people to both understand information and share ideas. It is purposeful in countless ways, from expressing abstract vision and explaining a circumstance, to showing how system information is used between various lines of business or organization segments. They help to translate architectural components into easily understood documentation more quickly.

Benefits of model and diagram language are to:

- Reduce the likelihood of adversely impactful architectural decisions. For example, they discover errors earlier and reduce system defects leading to exploring alternatives earlier in the solution development lifecycle.
- Gain and maintain executive sponsors and resources for EA and the program.
- Communicate high-level management-friendly views of scope.
- Show the boundaries of the scope and enterprise.
- Combine artifacts into information for action-oriented decision-making.

Models and diagrams are a central part of activities that lead up to the deployment of good systems. Architects use them to communicate the desired structure and behavior of systems and build them to visualize and control the system's architecture.

1.3 Fundamental Framework Views

Artifacts provided in the CEAF can be leveraged for a variety of uses. Available artifacts are comprised of action-oriented work products to support the creation of current and future state views of scope, and further support the transformation sequence roadmap to attain it. The roadmap and views provide a picture of the architecture in terms of what currently exists, is planned for the future, and which initiatives constitute a roadmap to transition to the future state. Since government operations and strategic goals are not static, these work products should be updated periodically to reflect new realities and changing directions.

CEAF recommends creating current and future state views that focus on a manageable number of key business outcomes and the underlying segments to provide quick value and gain executive support. This incremental approach allows the EA program to evolve over time.

CEAF provides views for reference that may expose opportunities for cross-program initiatives to share services and provide interoperable technology solutions for similar business goals. CEAF includes, but is not limited to:

- System architecture implementation patterns.
    - Reference Models
    - Enterprise Application Integration
- Common design patterns and themes.
- Common business planning scenarios.

2 Introduction

2.1 Background

Graphical artifacts (i.e.: models and diagrams) are important standardization elements that describe a part, or all, of an enterprise architecture. They provide the ability to see a hierarchy of organizational perspectives for further examination. With this intent an enterprise architecture model is not a single monolithic model, but rather a collection of related models and diagrams. Each with a description of some aspect of the enterprise. Some aspects are not modeled at all; it is the task of the program to determine how much of the enterprise must be modeled and for which purpose and when.

Upon consultation programs create views using implementation and design patterns, and service design standards to achieving resource optimization through common methods for analysis, design, documentation, and reporting.

In such cases both current and future state are two integrated views of the same architectural scope. They should take the form of a set of interconnected graphical artifacts that support better planning and management both within and across programs.

The current view provides the baseline for which change can occur, and the future state view provides the desired model for the same set of elements. Together they describe the relationship between an agency's strategic goals, business functions, information and/or enabling applications and technologies in an explicit and manageable way.

While current state models provide an awareness for a department/agency at a high level, they do not lead to the action that improves mission outcomes in accordance with strategic goals. A future state architecture and a roadmap, however, to get there are the primary deliverables that do. Creation of the future state architecture requires relevant information from the current state to analyze options and communicate alternatives and benefits to stakeholders.

2.2 Purpose

CEAF Views discusses the basic architectural views and framework around the idea that views of organizational components from specific perspectives provide a common understanding amongst business and technology domains. The views of systems, organizations, resources, and skills are graphically portrayed and improve communication among cross-functional teams to significantly increase the chance of achieving results. Graphical communication tools help programs to stay integrated into the decision-making processes of organizational management.

2.3 Intended Audience

The primary audience for this document is California state employees seeking information and guidance of the community's past experiences. The audience may also be interested in referencing the already discovered stories of architects in their development of EA work products. Those who create architectures and roadmaps, are strategic thinkers, provide EA services, and/or choose to follow EA methods may benefit from the information herein. State employees involved in the planning, approval,

execution and oversight of state programs, and those employees in private industry who support these activities, can also benefit.

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 Portfolio

C. California Enterprise Architecture Framework Program

D. California Enterprise Architecture Framework Views (this document)

- **Section 1 Executive Summary** provides an overview of the importance of graphical models and diagrams (views), their benefits, and basic components.
- **Section 2 Introduction** provides a background of CEAF's basis for utilizing current and future state architectural views in organizational planning as well as intentions to flex for future government service trends.
- **Section 3 Framework Views** provides basic understanding of current, future and target views of architectural scope. It also explains the basic purpose of domain specific views present in state departments/agencies and sample tools that architects can use to analyze information.
- **Section 4 Architecture Patterns and Themes** provides the basic overview of CEAF's reference models, design patterns and themes and where architects can find references.
- **Section 5 Glossary of Terms** provides a list and definition of commonly used EA terms.

2.5 Future Directions

As the statewide program matures, reusable information such as reference models, use cases, and design patterns will be refined and published. In some cases, analyzed for statewide implementation and consideration for cross-program share-ability. Future revisions may include:

- Separate domain and/or reference models to address cross-domain aspects such as security depending on industry developments. Segment level architecture views that can then be developed and reused through Cross Agency Initiatives (CAIs) and/or through collaborative Communities of Interest (COIs).

- Models promoting multi-tenant platforms and solutions for state-level sharing and service management automation.
- Intra- and inter-agency collaboration to achieve higher levels of enterprise architecture maturity and realize the corresponding benefits.

Please note that the effort to create and maintain reference models, implementation design patterns, and service design standards is ongoing.

2.6 Deferred Decisions

It is likely that future reference models, for new digital service areas (including the areas of business), will be created and integrated into the state-level target architecture to progressively move towards higher levels of integration and cross-program sharing.

3 Framework Views

3.1 Build EA Iteratively

CEAF promotes placing the development of the enterprise architecture using a segment approach at the forefront. Taking this iterative approach elicits the following benefits:

- Provides more fast and frequent value and helps to gain executive support for a sustained program.
- Facilitates incremental development of an agency's enterprise architecture.
- Allows identification of crosscutting segments that serve several lines of business within or between programs that support similar mission areas.

An enterprise architecture segment is part of the enterprise's overall architecture and documents the architecture of one or more lines of business or business service capability. Segment components describe core mission areas, supporting processes, and distinct, common, and/or shared business and enterprise services. Segments can be defined either organizationally (e.g., as a business unit and per the organization chart) or functionally (e.g., as a vertical or crosscutting mission or support service or capability).

A crosscutting segment serves several lines of business within or between department/agencies such as the organizations Information Security program. Cross cutting segment components are components that include several lines of business, such as email systems that serve the whole enterprise, and financial systems.

Segment analysis focuses on a service area or business unit within a department/agency or between programs. The result is a detailed, results-oriented baseline and target architecture as well as any transitional strategies necessary for that portion or segment of the architecture.

3.2 Current State

Current state architecture views are important to an enterprise in that they establish or verify what business and technology resources are being used to support the achievement of strategic goals. This becomes a reference baseline, much like an inventory, that then supports planning for the future. The current view is intended to show business components and its enabling IT resources active in the operating environment. More specifically they provide documentation of existing strategic goals, business services, information flows, IT systems/services, and technology infrastructure, as well as common "threads" such as security and workforce.

Baselines consist of the following current state model and diagram artifacts:

- Business Architecture – describes the current state business capabilities and overlaying business process model.
- Information Architecture – describes the structure of the existing logical and physical data assets and data management resources supporting the business processes.

- Applications Architecture – describes the applications in place to manage the information and support the business processes including their key components and interactions.
- Technology Architecture – describes logical software and hardware capabilities and the networks providing communication paths to support the business, information, and application services.
- Security Architecture – describes information security and privacy controls within and between business, information, and application services that promote the confidentiality, integrity, and availability of the architecture.

It is in the documenting of these architectures views that reveal associations, dependencies, and performance gaps in meeting business expectations. The collection of baseline documents exposes strategic gaps for which transformation opportunities emerge.

3.3 Future State

Future state architecture views represent a modified "to be" vision of the baseline within the context of the strategic direction and operating model. Future state architecture views also identify the motivational elements driving the future state and relate them to other architecture elements.

When planning the future state architecture, architects should apply “enterprise thinking”. The intent of enterprise thinking is to architect basic IT capabilities as enterprise-wide multi-tenant enabled capabilities that can potentially be shared within the department and potentially cross-agency. Enterprise thinking requires incorporating standards, reference models and re-use implementation patterns as applicable.

To facilitate interoperability and service share-ability, future state views need to sufficiently describe the applicable components in each architecture domain and specify their key attributes. They consist of the following future state model and diagram artifacts:

- Business Architecture – describes the desired business capabilities and business process model.
- Information Architecture – describes the structure of the logical and physical data assets and data management resources required to support the desired business process model.
- Applications Architecture – describes the application systems necessary and relevant and how those multiple applications work together to support the desired business process model and manage the information.
- Technology Architecture – describes the desired technology capabilities and network communication paths will be necessary to support the desired business process model, information, and application services.

3.4 Target Architecture

The target architecture is an important part of the future state vision. It enables departments to realize synergies and efficiencies across diverse business units and allows for business unit autonomy when it is the best course of action. A target architecture should:

- Serve as a “model”, communication tool, and key input to creating the enterprise’s future vision.
- Depict how architectural patterns can be used as building blocks in cross-program solution design and shared services and systems.

Standardization and shared platforms illustrate the intent to communicate the position and applicability of architectural patterns. The drive to facilitate repeatable solutions, possibly leading to the identification and implementation of shared solutions, will continue to evolve.

The progression of a target architecture, as envisioned, is loosely described below:

1. As departments take steps to modernize business and operations where necessary, their special purpose applications and technology will be limited to distinct business operations. These do not require data sharing and coordination with other business operations but still share some business and technical services, such as common infrastructure. Department target architecture should strive for sharing/consolidating business processes and enabling technologies.
2. Agencies then will implement standardized solutions (architectural patterns and technologies) for common business capabilities and processes. When solutions and corresponding technology(s) are standardized, programs can share them thereby eliminating or reducing the need for duplicate investments and increasing their workforce capabilities to better support them.
3. Further maturity will lead to standardized core and support business processes within and among state Agencies. Business process management solutions at Agency and State level support sharing of processes and data within the departments and among Agencies. Intra- and inter-agency shared business services will increase, and interoperability will reach an optimal state.

The target architecture vision is a long-term view for evolving the organization’s enterprise architecture. It cannot be realized quickly, or without collaboration, core process ownership, and long-term support. Therefore, CEAF recommends EA programs focus on slices of department-level business operations before advancing to agency-level standardization.

3.4.1 Transformation Strategy Iteration

It is common for transformation strategies to execute many projects before the enterprise target architecture can be achieved, therefore an individual transformation initiative may result in the need for an intermediate architecture. When undertaking such initiatives, the intermediate architecture becomes the target architecture from the point of view of that initiative. Upon successful completion, its target architecture gets incorporated into the current view of the enterprise architecture. This iterative process

supports institutional learning that can be reused and change the fabric of how digital services are designed and implemented. To support the business case, subsequent investment review and approval processes, a detailed transition plan may be required that includes the current and future state architecture views from the project's viewpoint.

The following steps provide guidance to develop or align implementation strategies for transformation initiatives, and to facilitate maturity in the organization's enterprise architecture:

- Use architectural drivers, dependencies, and the capabilities of ongoing transformation initiatives to determine the architecture areas for which to create standardized solutions.
- Integrate design patterns into initiatives to guide solution efforts. Harvest, reusable assets based on best-practice implementations, the patterns for common capabilities. Apply principles-based decision-making in the creation of these implementation patterns. Doing so reduces conflict and helps progress by focusing discussions away from specific organization or technology preferences and by allowing supportable and consistent decisions.
- Collaborate with technology service providers to enhance the organization's capabilities to provide the above implementation patterns as standard services and multi-tenant consumers.
- Continually collaborate and analyze other organization's transformation roadmaps to identify and undertake cross-program initiatives that develop shared solutions and ultimately cost.

3.5 Architecture Motivation

Motivation are important elements of EA that is the basis for why the architecture is constructed the way that it is.

Motivation elements are the actual impetuses or inspirations (i.e., goals, principles, requirements, and constraints) and the forces (i.e., stakeholders, drivers, and assessments) that together affect the enterprise architecture. They are related to the organization's domains (i.e.: strategic, business, information, applications, and technology domains), and provide better integrated views across organizational and functional segments.

Motivation also manifests itself in work activities and work products that drive architectural decisions. For example, stakeholder interviews, application assessments, state regulations are all motivations that influence future state architectures. The elements of motivation that are considered are critical to EA programs in their day-to-day work. Not only do motivating aspects inform progress, they also provide caveats or constraints so as to prevent over engineering.

3.6 Cross-Domain Elements

Cross-domain components are aspects of the enterprise architecture operating in multiple domains, rather than separately, such as security, skills, performance, or service-oriented architecture, etc. The terms used suggest that these areas are

enterprise architectural domains of their own. However, closer examination reveals that they are present in multiple domains – hence the label “cross-domain”.

CEAF identifies that motivation and cross-domain elements are discussed in each engagement, each domain, each initiative, rather than individually and separately.

3.7 Strategy

Strategic views, driven by motivation, are high-level direction perspectives that an enterprise or organizational segment sets for itself. Strategic views support strategic planning efforts by presenting linkages of organization domains and developing longer-range future state scenarios and goals. They also highlight impacts to business and technology roles and activities in achieving the goal within a given scenario.

Through the strategic planning process, one future state scenario is selected to represent what the enterprise or segment(s) is going to do. Organizations then adjust to accommodate its undertaking. Through this strategic planning process artifacts should be updated and officially published as changes are made to the strategic plan.

EA programs can assist in the formation of strategic planning and in doing so deliver value that:

- Results in an outcome within an operating scenario that is discernable and measurable.
- Does not reduce the enterprise’s flexibility so much that other operating scenarios cannot be pursued.

Examples of common artifacts that support strategic planning activities are identified in Table 2. Refer to the CEAF repository for such artifacts, as well as the EA Community for strategic-view contributions.

Table 1: Strategic View Artifacts

EA Components	Supporting Artifacts
Enterprise Strategic Plan IT Strategic Plan Capital Planning	Motivation Model Strategic Plan template SWOT Analysis Concept of Operations Scenario Journey Mapping Concept of Operations Diagram Roadmap Capability Map Portfolio Balanced Scorecard

3.8 Business

Understanding the organization's business architecture (BA) should be first and foremost. The CEAF places significant emphasis on the importance of understanding and accurately representing the organization's business architecture. Ultimately the technology domains operating within organizations run the risk of under or over delivering IT services if enterprise understanding of business services and processes are not clearly and concisely illustrated in a manner understood by all.[1]

Business context and business process views show the parts of a capability within an organization in a format that can be further decomposed and interrelated with other processes to show relationships. Architects can further identify inputs, controls, outputs, and mechanisms to provide context of the complete business capability's activities.

BA explanations, elements, future planning, and Business Reference Models are available in the statewide repository.

Examples of common supporting artifacts that contribute to the understanding of business architecture are identified in Table 3. Depending on need, supporting artifacts can provide valuable insight to multiple EA components. Refer to the CEAF repository for such artifacts, as well as the EA Community for BA focused contributions.

Table 2: Business View Artifacts

EA Components	Supporting Artifacts
Business Process Program Charter Customer Relationship Management Service(s) Stabilization	Business Model Canvas Business Capability Map Business Plan and Roadmap Business Concept/Business Case Business Impact Assessment Business Capability Maturity Assessment Business Intersection Connectivity Diagram 5-Whys Analysis Business Process/Service Model and Matrix User Journey Map Use Case Narrative and Diagram

3.9 Information

Information Architecture (IA) describes the fundamental organization of the data and information that support business processes and application systems. IA deals with the fundamental organization of data and information, and the principles guiding their detailed design and evolution. As such, information architecture in the EA context, is at

[1] EA[3] *An Introduction to Enterprise Architecture*. Scott Bernard. 2012

a high level and is mainly concerned with the overall coherence of data and information at the enterprise level.

Whereas BA describes the input information, output information, and shared or stored information used by the business processes, IA works with BA to organize this information and map data entities to BA business processes. Doing this represents the overall conceptual structure of the data, independent of any software or data storage structure and provides a visual representation of the high-level information entities needed to run an enterprise or provide a business capability.

Artifacts include identifying information structures and flows, and in that, it is important that artifacts show not only what is in each system, but also how systems interact with each other. Data can be analyzed using different methods, depending on how the resulting information is intended to be used and should reflect the processes that transform data within the information system. Data flows can be decomposed from a very high level to a basic process level, to several sub-levels that examine each process in greater detail. [2] The level of detail needed is dependent on the architect's participation and purpose of the artifact.

IA explanations, elements, future planning, and Data Reference Model are available in the statewide repository.

Examples of common supporting artifacts that contribute to the understanding of information architecture are identified in Table 4. Depending on need, supporting artifacts can provide valuable insight to multiple EA components. Refer to the CEAF repository for such artifacts, as well as the EA Community for IA focused contributions.

Table 3: Information View Artifacts

EA Components	Supporting Artifacts
Database Data Warehouse / Data Mart Knowledge Warehouse Information System	Information Exchange Matrix Knowledge Management Plan Conceptual / Logical / Physical Data Models Data Profiling Entity Relationship Diagram Data Dictionary / Object Library

3.10 Application

Applications Architecture (AA) describes the structure and behavior of the major kinds of application systems and their key components necessary to support business process information. AA represents how applications interact with each other, how users interact with them, and what data get utilized, manipulated, or created.

[2] EA[3] *An Introduction to Enterprise Architecture*. Scott Bernard. 2012

Within CEAF, AA is concerned with managing how multiple applications are positioned to work together to support the business. AA at this level is not concerned with the detailed design of application systems, rather the goal here is to define enterprise-relevant application systems and what they need to manage data and present information.

Application views should identify an accurate picture of the enterprise's software applications. Unfortunately, since applications are commonly developed independently, views at the application level show a lack of integration in areas with requirements for exchanges of information, duplication of functions, and little or lots of vendor diversity and or where business requirements are not being met. Due to this, architects can create enterprise application views through combining smaller scoped engagements.

System level views of software applications that an enterprise uses to support business, office automation, and other functions are often varied in their design, programming languages, interface points, and source vendors. It can be helpful for architects to create a view(s) of these support applications to show what application flow and system interactions are present in the context of the application. Secondarily helpful is the general types of business functions being supported as well as active front/back office services and operations systems that the enterprise has in its IT operating environment.[3]

AA explanations, elements, future planning, and Service Component Reference Models are available in the statewide repository.

Examples of common supporting artifacts that contribute to the understanding of application architecture are identified in Table 5. Depending on need, supporting artifacts can provide valuable insight to multiple EA components. Refer to the CEAF repository for such artifacts, as well as the EA Community for AA focused contributions.

Table 4: Application View Artifacts

EA Components	Supporting Artifacts
Enterprise Resource Planning Solutions	System Interface Inventory
Hosted Applications	System Communication Diagram
Software Applications	System Operations Matrix
Web Services	Web Application Diagram
Service Bus and Middleware	System Performance Matrix
Operating System	Application Flow Diagram
	System Architecture Assessment

[3] EA3 *An Introduction to Enterprise Architecture*. Scott Bernard. 2012

3.11 Technology

Technology Architecture (TA) describes the logical software, hardware, and communication capabilities (also known as infrastructure) that are required to support the deployment of application and data components. This includes hardware devices and system software, and the communication networks of these devices. TA also describes the structure and interaction of the platform services provided by the computational resources and networks, and the technology components that enable these platform services.

Within the CEAF, the TA defines what nodes (i.e.: network device), host which application and data artifacts, as well as what devices and system software comprise each node. TA also defines the types of network communication paths that host the devices and transport information. Lastly, TA defines the infrastructure interfaces/services used by the application components or functions. Thus, the focus of TA is the infrastructure-level components and services necessary to provide integrated infrastructure support of the business rather than be internal specification and configuration details.

At the infrastructure level view, networks, backbones, routers/switches/hubs, equipment rooms, wiring, and security appliances are described to show logical and physical designs. Each should be documented so that decisions around operations and maintenance is supported. This topic leads to the discussion of configuration changes and hardware/software inventories. And yet both of those topics feed directly back into the discussion of governance and integrated governance structures within the organization. Technology architecture and engineering activities will progressively detail all aspects of the TA over time. [4]

TA explanations, elements, future planning, and Technology Reference Models are available in the statewide repository.

Examples of common supporting artifacts that contribute to the understanding technology architecture are identified in Table 6. Depending on need, supporting artifacts can provide valuable insight to multiple EA components. Refer to the CEAF repository for such artifacts, as well as the EA Community for TA focused contributions.

Table 5: Technology View Artifacts

EA Components	Supporting Artifacts
Data Networks	Network Connectivity Diagram / Inventory
Cloud Computing	Cloud Connectivity Diagram
Telecommunication Networks	Building Blueprint
Security Solutions	Cable Diagram
Video Networks	Rack Diagram
	Equipment Inventory

[4] EA3 *An Introduction to Enterprise Architecture*. Scott Bernard. 2012

4 Architecture Patterns and Themes

An IT pattern identifies how a set of technology elements should interact and deploy to best deliver a solution that supports an application or system. One pattern, reference models are patterns used to define how technology elements (computational resources, networks, and system software) work together to best meet the needs of the application or system in a cohesive and interoperable manner.

In CEAF, information technology patterns are based on defined architecture implementations and are expected to provide the following benefits:

1. Ensure individual technology elements and corresponding standards are interoperable and work together in the context of a larger application, system, or a system-of-systems.
2. Improve consolidation and standardization of data and reduce data redundancies.
3. Validate standards are relevant; if a standard/technology is never used in a pattern, perhaps it is not needed.
4. Reduce technical complexity by reusing patterns and technology components within and across organizations.
5. Enhance ability to leverage solutions across state agencies.
6. Progresses enterprise architecture by creating standardized capabilities for interoperability through cross-program application and information integration platforms, and business objects.
7. Reduce risk, improve deployment speed, and reduce support and maintenance costs.
8. Provide a mechanism for a more accurate estimation of capital and operational expenses.
9. Simplify information technology purchasing, training needs, and increase widespread skills that promote institutional learning.
10. Position the state to leverage self-service provisioning capabilities.

CEAF recommends a bottom-up approach for creating these IT patterns. Using the CEAF reference models, departments/agencies can create implementation patterns based on their projects, recently created or modernized application systems. When architects recognize their organizations' technology patterns, they can formulate the architecture that represents the whole of the enterprise, and then refer to the start of any new initiative. Beyond the organization boarder, those patterns may be reviewed for consideration as a cross-program or statewide standards and proposed to the appropriate groups (Enterprise Architecture Community, Information Technology executive Council and/or Technology Operations Advisory Council) for consideration and action.

4.1 Distinct, Common, and Core Elements

Developing patterns requires a common nomenclature for both common and unique elements. Variances in modeling exist among distinct, common, and core elements of the architecture scope and can exist in both business and technology. For instance, when considering business operations, the distinction helps analyze existing business

processes – they can be classified into distinct, common, and core processes based on the business drivers and strategic goals:

- Distinct business processes are specific to a business unit with little to no integration or coordination with the processes of other business units.
- Common business processes are those that are common to some, not all, business units. Note that in contrast, enterprise applications focus on sharing all components of the underlying architecture (business processes, applications, data sources and technology) while protecting access to information based on “ownership” rules.
- Core business processes are those that are common to all business units. In target architectures, these core business processes will usually be supported by shared enterprise applications at agency and/or state levels.

When considering technical operations, the distinction helps analyze current state architecture – they can be classified into distinct, common, and core infrastructure services based on business operations:

- Distinct architecture is specific to a capability, process, or segment with little to no integration or coordination with other architectures.
- Common architecture is that which are common to some, not all, capability, process, or segment.
- Core architecture are those that are common to the entire organization architecture. (i.e.: email, document management). They are usually shared enterprise applications at agency and/or state levels.

The goal is not to impose that everything must be standardized, centralized and/or shared. Although the future state enables more of standard and shared solutions at the common or core levels of organizations, the decisions as to which solutions should be treated as standardized, shared, or common, should be driven by the business operating model, the business strategy, and the desired business outcomes.

4.2 Reference Models

A reference model is a template design for a defined architectural purpose. It is an abstraction of multiple solution designed and implemented to solve a specific and recurring business or technical problem. They incorporate knowledge, patterns, and best practices gained from multiple successful implementations and serve as a key input when creating target architectures. They guide and constrain the instantiations of multiple designs and solutions.

Standards play a significant role to augment and drive the reference models describing how specific products can be combined to deliver a cohesive, effective, and sustainable solution. The standards should promote controlled innovation to balance advancements in technology with an organized, business-oriented technology planning and governance effort.

Reference models:

- Incorporate knowledge, patterns, and best practices gained from multiple successful implementations.

- Guide and constrain the instance of multiple designs and solutions.
- Provide risk mitigation, simplify decision-making, improve deployment speed, and reduce cost.
- Explain the context, goals, purpose, problem being solved and major foundational components (e.g., architecture components) of the architecture scope at multiple levels of abstraction (conceptual, logical, and physical).
- Serve as a reference foundation for architectures and solutions and may also be used for comparison and alignment purposes.
- Provide a key mechanism to prevent unchecked acceptance of disparate solutions, diluting the talent pool, and increasing support and maintenance costs.
- Facilitate repeatable solutions across departments that support shared solutions. Reduce challenges in the ability to leverage solutions across state entities.

Reference models are key contributors to IT solution design. Today state initiatives often identify with these eight models however are changing as the industry's technology services modernize. Each of these logical model views, along with others, are available in the statewide repository[5]. The following logical reference models have been created:

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

In recent years, more state solutions are migrating to cloud-based implementations and is gaining popularity. Implementation architectures can be informed and built from reference model components. The models depict how technological and system software services can be implemented in conjunction with your overall IT landscape.

4.3 Common Business Scenarios

California's IT community participates in business operating scenarios common amongst most departments/agencies. CEAF recognizes these as common business scenarios. They are functions, processes or activities that are exercised in very similar ways by most state entities that usually adhere to or are supported by policy or some other recognized compliance framework. As mentioned in the CEAF Program and Portfolio, EA programs are more likely to provide consistent services more often in these situations. These common scenarios are widespread and demand higher frequency of consultation. Consistent architectural service patterns for each scenario offers a high-level view from the perspective of the enterprise, business, and/or technology viewpoints. Specified artifact templates and guidelines act as the launching point to facilitate meaningful output to be used as input(s) to the work of the scenario.

[5] EA Statewide Repository

The CEAF will adjust as the EA community collaborates and gains awareness in work stream patterns, resulting in new or modified EA services to meet common state business needs.

Currently CEAF identifies the four common business scenarios – Project Planning, EA Program Planning, Governance Planning, and Work Stream Transformation Planning. A foundational set of materials is provided in the statewide repository[6], as a launching point for organizations working in these scenarios.

4.3.1 Project Planning

Regardless of the project planning framework methodology or oversight processes of state IT initiatives, EA plays a significant role in the architectural planning of the proposed project solution. Enterprise architects facilitate and support a common understanding of needs and help formulate recommendations to meet those needs. They contribute to the development of a plan-of-action that is grounded in an integrated view of not just technology planning, but the full spectrum of planning to include motivation, business planning, application portfolio planning, security planning, infrastructure planning, capital and human capital planning elements.

A high-level view of one project planning work stream scenario from the architect viewpoint is provided in the statewide repository[7]. The view ensures enterprise alignment between strategy, business and technology is at the forefront of project planning. CEAF recommends programs consider overlaying department EA program activities over the state IT project lifecycle for alignment and greatest value to departments.

4.3.2 EA Program Planning

Successfully delivering EA services as are described in CEAF is nearly impossible without the establishment of a dedicated team to apply the methods and framework to mission tasks. Establishing a program, much like other concentrated management functions within organizations, possess components that should be considered in relative sequence. A program development roadmap is provided in the statewide repository[8] to assist organizations that wish to take strategic steps to establish a program or enhance an existing one.

CEAF provides a high-level view of the program planning work stream scenario from the architect viewpoint to ensure programs are consistently structured to provide the greatest value possible.

[6] EA Statewide Repository
[7] EA Statewide Repository
[8] EA Statewide Repository

4.3.3 Governance Planning

EA programs actively participate in the organization's governance activities at both the enterprise and project levels as architectural advisors and stewards. The governance provided by EA programs requires that the strategic and investment decisions of organizational leaders be complementary to the future state and target architectures. Architects advise the organizations governing or internal management body(s) based on current and future state architectural information that have potential impacts to mission, purpose, direction, priorities, and strategies. This role should not be confused with oversight, but rather informational to the decision-making body(s).

In project focused governance, the relationship between the solution architecture and EA, and the need to provide guidance, oversight and/or facilitation in the solution design requires the tactical and consistent involvement of the EA program. This allows architects to:

- Ensure the project specific solution architectures align with the target architecture, reference architectures and implementation patterns.
- Be aware of required capabilities in individual solutions to promote controlled innovation while taking those innovations back to the reference architectures for reuse.
- Contribute to complex or otherwise architecturally significant solutions when EA skills enhance the success of the projects.
- Ensure the transformation projects are best positioned to deliver their assigned outcomes, and business and IT objectives.

Program involvement in solution architecture design and consultation is also intended to assist the specific project management team to achieve predictable project success. It helps balance project management and technical leadership; a balance that is key for transformation project success.

CEAF provides a high-level view of a governance planning work stream scenario from the architect viewpoint in the statewide repository[9] to ensure the program is consistently represented in internal management activities within the enterprise.

4.3.4 Fast and Frequent Work Stream Planning

With the fast-paced advancement of technology and service delivery trends, architects may find they need to meet professional service demands with faster and narrower analysis cycles to provide informed inputs more quickly. The organization's urgency to react may not allow time to perform traditional analysis and design activities, however, maintaining expected value. In these situations, architects can be prepared with a toolkit of purposeful artifacts that support the facilitation of these fast-paced transformation initiatives. Whether transformation be capability or technology focused, architects

[9] EA Statewide Repository

should be poised and ready to consult pulling on a finite set of artifacts that drive to conclusions quickly.

CEAF provides a high-level view of a work stream transformation scenario from the architect viewpoint in the statewide repository[10] to ensure EA is meeting the fast-paced demands in reactive times.

[10] EA Statewide Repository

5 Glossary of Terms

Term	Definition
Application Architecture	Describes the structure and behavior of the major kinds of application systems, their key components, their interactions, and their relationships to the core business processes.
Architecture	A set of design artifacts, or descriptive representations, that is relevant for describing an object such that it can be produced to requirements (quality) as well as maintained over the period of its useful life (change) [John Zachman & adopted by the Federal Chief Information Officer Council].
Architectural Patterns	These solutions include Business Intelligence, Enterprise Content Management, and Master Data Management.
Architecture Segment	Focus on a subset or a specific business area within the enterprise. It can be considered an event-driven process, such as grants, that crosses the enterprise and has commonality of process, data, components, and technology. Each architecture segment is composed of current and target architectures, limited in scope by the focus of the segment.
Artifacts	A documentation product that represents an EA component.
Assessment	The outcome of some analysis of a driver. An assessment may reveal strengths, weaknesses, opportunities, or threats for an area of interest. These outcomes need to be addressed by adjusting existing goals or by setting new goals.
Business Architecture	Defines the business strategy, organization, business capabilities and key business processes which realize those business capabilities.
Business Capabilities	An expression and representation of what business does and has an ability to do.
Constraint	A restriction on the way in which a system is realized. This may be a restriction on the implementation (e.g., specific technology to be used) or other restriction such

Term	Definition
	as the budget constraint. Like requirements, CEAF relates constraints to the following domain elements: ○ Business Processes ○ Information Objects ○ Application Services ○ Infrastructure Services
Common Business Scenarios	State functions, processes or activities that are practiced in the same way by most state entities and that usually adhere to or are supported by policy or some other recognized compliance framework.
Current Architecture	Represents the baseline architecture for the enterprise. In terms of the California Enterprise Architecture Framework, the current architecture includes business, information, application, and technology.
Current View	An EA artifact that represents an EA component or process that currently exists in the enterprise.
Diagrams	A pictorial representation of feature-rich graphical depictions. Often full of ambiguities and not semantics are not well defined.
Driver	Something that fuels the change in an organization. Drivers may be internal; in which case they are usually associated with a stakeholder. Some internal drivers are “customer satisfaction”, “compliance to legislation” and “operational expenses”. Drivers may also be external, e.g., “changing legislation”.
Enterprise	An organization supporting a defined business scope and mission. An enterprise is comprised of interdependent resources (people, organizations, and technology) that should coordinate their functions and share information in support of a common mission (or set of related missions) [Treasury Enterprise Architecture Framework].
Enterprise Architecture	A strategic information asset base, which defines the mission; the information necessary to perform the mission, the technologies necessary to perform the

Term	Definition
	mission, and the transitional processes for implementing new technologies in response to changing mission needs; and includes a baseline architecture, a target architecture, and a sequencing plan [Federal Enterprise Architecture Framework].
Future View	An EA artifact that represents an EA component or process that does not yet exist in the enterprise.
Framework	A logical structure for classifying and organizing complex information [Federal Enterprise Architecture Framework].
Goal	An end state that a stakeholder intends to achieve. Goals are generally expressed using qualitative words; e.g., “increase”, “improve”, “reduce”. It is also common to associate concrete objectives to goals; e.g., “increase real-time electronic ID verifications to 99%”. Due to varying practices in writing goals and related objectives among state agencies, CEAF treats both goals and objectives as goals.
Information Architecture	Describes the fundamental organization of the data assets and data management resources that support an enterprise’s business processes and enabling application systems.
IT Patterns	Identifies how a set of technology elements should interact and be deployed to best deliver particular types of applications or systems.
Line of Business	The purpose of government in functional terms and the support functions the government must conduct to deliver services to citizens.
Methodology	A documented approach for performing activities in a coherent, consistent, accountable, and repeatable manner [Treasury Enterprise Architecture Framework].
Models	A specification of a system or part of a system using formal methods (precise descriptive notation).
Motivational Elements	They are the actual motivations or intentions (i.e., goals, principles, requirements, and constraints) and the sources of those motivations or intentions (i.e.,

Term	Definition
	stakeholders, drivers, and assessments) that together affect the enterprise architecture.
Nodes	A device or data point in a larger network.
Principles	The way in which system context is realized; they are related to requirements and goals.
Reference Model	A classification taxonomy for understanding significant relationships among the entities of some environment, and for the development of consistent standards or specifications supporting that environment. A reference model is based on a small number of unifying concepts and may be used as a basis for education and explaining standards to a non-specialist [Federal Chief Information Officer Council].
Requirement	High level enterprise statement of need realized from a system derived from the goals and principles, not detailed software requirements. As such, a requirement relates to almost any of the domain architecture elements. CEAF relates requirements to the following domain elements: ○ Business Processes ○ Information Objects ○ Application Services ○ Infrastructure Services Requirements model the properties of the domain elements that are needed to achieve the end state represented by the goals.
Stakeholder	An individual, team, or organization (or classes thereof) that represents their interests in, or concerns relative to, the outcome of the architecture. To direct efforts to these interests and concerns, stakeholders set, change, and emphasize goals.
System	A collection of components organized to accomplish a specific function or set of functions [IEEE STD 610.12].
Target Architecture	Represents a desired future state or "to be built" architecture for the enterprise within the context of the strategic direction. In terms of the California Enterprise

Term	Definition
	Architecture Framework, the target architecture includes business, information, application, and technology.
Technology Architecture	Describes the logical software and hardware capabilities that are required to support the deployment of business, information, and application services. This includes IT infrastructure, middleware, networks, communications, processing, and standards.
Views	The ability to see something from a specific vantage point.
Viewpoints	The position from which a view is observed. A viewpoint is a collection of patterns, templates, and conventions for constructing one type of view.