Open Group Guide

The TOGAF® Leader's Guide to Establishing and Evolving an EA Capability

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Preface

The Open Group

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This Document

This document is the TOGAF® Leader's Guide to Establishing and Evolving an EA Capability. It has been developed and approved by The Open Group.

This Guide puts forward current thinking on establishing an Enterprise Architecture (EA) Capability that aligns to a set of requirements and expectations specific to each enterprise. It proposes an approach for the standing-up and enhancing of an enterprise's EA Capability based upon the established best practice contained within TOGAF®, an Open Group standard.

This Guide is structured to provide the context, content, and rationale behind choices and steps that an EA Leader can consult at any point in time to set up, operate, or improve the value extracted from the practice of EA in the organization.

The intended audience for this Guide is as follows:

- Professionals who have been tasked with establishing and evolving an enterprise's EA Capability
- Business Leaders who are contemplating an investment in EA as a strategy

- Strategy and technology advisors to an enterprise's Leaders
- Professionals and experts who are enthusiasts in the field of EA or organizational transformation

This Guide is written directly for the person who is tasked with developing, sustaining, and evolving an EA Capability that delivers what their enterprise needs.

A high-functioning EA Capability optimizes Boundaryless Information Flow™ within and between enterprises based on open standards and global interoperability.

Trademarks

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Part 1: Introduction

1 Introduction

This Guide presents current thinking on establishing an Enterprise Architecture (EA) Capability that aligns to a set of requirements and expectations that are specific to each enterprise.[1] It proposes an approach for the standing-up and enhancement of an enterprise's EA Capability based upon established best practices. This approach follows a configured path through the TOGAF® Architecture Development Method (ADM).

This Guide is written for the EA Capability Leader, the person who is tasked to lead the effort to establish or evolve an EA Capability. We have selected the term *Leader* deliberately to reflect the role rather than any one of the myriad titles in an enterprise the Leader may have. This Guide is structured to provide the context, content, and rationale behind choices and steps that an EA Leader can consult at any point in time to set up, operate, and improve the value extracted from the practice of EA in the organization. A high-functioning EA Capability optimizes Boundaryless Information Flow™ within and between enterprises based on open standards and global interoperability.

Practicing EA requires in-depth interaction with several specialized functions such as strategy development, HR policies, and corporate accounting. This Guide:

- Introduces key topics of concern
- Defines the terms related to the topic
- Shows the terms that are related to an EA Capability
- Discusses what the Leader needs to know
- Describes what the Leader should do with this knowledge

This Guide transitions its focus between setting up a new EA Capability practice and evolving or re-establishing the practice. It is presented this way to reflect the reality of the state of EA prevalent in the industry at the time of writing.

This Guide is divided into six parts.

Part 1 (this part) is the introduction, including an assessment of the state of EA, definitions, and key concepts used in this Guide.

Parts 2 and 3 present a narrative that leads the reader through a series of topics and related steps to assist in stepping back from the current operational context to seek a broader perspective. Ideally, the contents of these first two parts should form a companion to the TOGAF ADM or similar architecture development processes, methods, or frameworks that an enterprise may

[1] The terms *business*, *company*, *organization*, and *enterprise* are often used interchangeably in various texts. This Guide uses the term *Enterprise* to refer to a logical entity that is taking part in an economic activity; i.e., one that involves some kind of risk/reward or new way of solving socio-economic problems. Likewise, the term *organization* is in reference to a group of personnel brought together to perform a set of tasks and deliver the outcomes defined for them. The term *business* is used to refer to the team that formulates and manages the outcomes that the Enterprise is set to do. And the term *company* is used only when it improves readability, though the definition remains that of an Enterprise.

choose to adopt. This Guide takes this approach deliberately. It focuses on outcomes without being distracted by implementation or evolution. This is done by simply focusing on what must be done and what needs to be achieved out of the steps.

Part 4 covers adoption of the EA Capability. This includes preparation and initiation activities required to establish or enhance the EA Capability that would be relevant to an enterprise.

Part 5 shows a simple mapping of how the TOGAF ADM can be practically used. This follows a "configuration" of the TOGAF ADM for architecting and establishing an EA Capability. It serves as an example to show how the TOGAF ADM could be customized to address the purpose for which an EA Capability is being established.

Part 6 contains appendices.

Not all scenarios or related fields discussed in this Guide will be relevant for every enterprise, and especially in the first attempts at creating an EA Capability. Establishing any capability is an iterative process. This Guide is intended as a starting point to create or evolve an EA Capability, when the purpose for performing EA changes, or when the charter for a team changes.

Even though this Guide has a logical structure, it is not designed as a simple task-list. The depth and detail of every step taken by the EA Leader is iterative, and the only variable is time spent for each step. As with all change work, listing what you need to know is not the same as defining the level of detail in documentation. This Guide provides a concise summary of what you need to know to establish the EA Capability in Table 9.

It is the EA Leader's judgment to consider the level of depth and documentation and how to iterate in a manner that best suits an enterprise. The intent of this Guide is that you read Chapter 4 (Enterprise Context and EA Context) and Chapter 5 (Business Objectives for the EA Capability) before making any judgment call on the approach to building an EA Capability.

Experience has shown that there is *no one right* EA Capability model. There are numerous examples of EA Capability being focused on strategy or portfolio or project or a combination of these. EA Capability has been aligned to organizational change leaders, supporting specific transformation efforts, or has focused on continuous improvement and change or embedded within an IT organization. This Guide will help the Leader of an EA Capability to identify an approach that is:

- Appropriate to the enterprise
- Appropriate to the context of the EA Capability
- Appropriate to the purpose of the EA Capability

This Guide presents a tailored approach to establish and evolve EA Capability, aligned to the TOGAF Preliminary Phase. The EA Capability is designed to deliver architectures for a purpose and to drive effective change. However, when presenting the concepts supporting each of the steps, the Guide presents a few leading alternative techniques and approaches. It is up to the Leader to identify and employ concepts or school of thought that best meets the needs of the enterprise.

The importance of aligning an enterprise's context to its purpose is paramount. It is dubious to suggest that there is a single, correct approach to align context to purpose and this Guide makes no suppositions to that effect.

1.1 How to Use this Guide with the TOGAF Framework

The TOGAF framework provides essential universal scaffolding useful to a range of organizations, industries, and architectural styles. Customization of the TOGAF framework is necessary to align to the enterprise's requirements and expectations. The question is how to customize the TOGAF framework.

The TOGAF framework is written for the practitioner, the expert, and in general the professional that would take the role of EA Capability leader; the person who thinks about the structure and practice of EA. This Guide is an interpretation of the TOGAF framework to support the Leader to establish or evolve an EA Capability – the person who is not worried about the theory, but who is worried about how to structure or maintain an effective EA Capability.

This Guide provides advice for establishing or enhancing an EA Capability based upon the TOGAF framework. Establishing an EA Capability is the purpose of the TOGAF ADM Preliminary Phase. This Guide follows the Preliminary Phase and provides in-depth commentary and guidance for executing the Preliminary Phase. This includes guidance on customizing and configuring the TOGAF ADM; defining a Content Framework; selecting, configuring, and customizing appropriate tools and techniques; and selecting, configuring, and customizing appropriate architecture practices.

1.2 The State of Enterprise Architecture

Research and survey by the Association of Enterprise Architects (AEA), the Corporate Executive Board (CEB), and Forrester during 2014 and 2015 present a wide spectrum of positive and negative impressions on the impact EA Capability has had on any enterprise. The responses showcase different practice models for EA Capability as well as a range of maturity levels. There are instances of high-functioning EA teams that were formed several years ago, to continuous initiation and shutting-down of EA teams. The key message that EA Capability is a function of context and purpose is often lost, in practice and discussions.

To respond to the demands and needs of their stakeholders, organizations need to develop new and better ways of managing continuous change at ever-increasing pace to deliver significant value in a transparent manner. Organizations need an EA Capability as an integral capability to support continuous and transformational change processes. However, over the years, many organizations have attempted to set up EA practices only to see them fail after a few years. In spite of these previous failures, enterprises repeatedly try to establish a successful EA Capability.

This Guide discusses a pragmatic and tested approach to establish, manage, and evolve an EA Capability based upon established successful practices. This Guide also presents an approach to successfully apply the practice of EA to amplify the value realized or re-establish the practice. This Guide presents various factors that influence the success of EA Capability.

2 Definitions

The following terms are highlighted and defined to distinguish them from their common English usage. As such, the terms below are distinctly defined and capitalized wherever found in this Guide. The Open Group intends for these definitions to be assumed when referenced in this Guide.

2.1 Enterprise

The highest level of description of an organization used to identify the boundary encompassed by the Enterprise Architecture and EA Capability.

Note: This definition is deliberately flexible and not associated with an organization's legal or functional boundaries. It covers monolithic organizations and extended organizations that include separate organizations connected by a mission or supply chain, as well as to the operating entities within an organization. Examples include the outsourced partners that provide manufacturing, logistics, and other support to an organization; a multi-national peacekeeping force; and a multi-billion dollar division of a Fortune 50 firm. All are enterprises.

2.2 Enterprise Architecture (EA)

Gartner defines Enterprise Architecture as "the process of translating business vision and strategy into effective enterprise change by creating, communicating, and improving the key principles and models that describe the enterprise's future state and enable its evolution".[2]

2.3 Enterprise Architecture (EA) Capability

The enterprise's ability to develop, maintain, and evolve an enterprise Architecture as well as its ability to use the architecture to govern change activity in the enterprise.

2.4 Capability

A management concept that facilitates planning improvements in the ability to do something that leads to enhanced outcomes. It enables the ability to measure resources employed and outcomes or goals achieved within a specified context.

Note: Formal modeling often requires a crisp definition. Without the recurrent formal model definition debates we would not have defined the term and relied upon the simplest standard English definition as "the ability or potential for an indicated use" and "something that has the potential to be improved".

[2] Gartner Clarifies the Definition of the Term "Enterprise Architecture" (see References).

2.5 Leader

The person tasked to lead the establishment and/or evolution of an EA Capability.

Note: This term reflects the role, rather than one of the myriad titles, that may apply.

3 General Concepts

This chapter describes the general concepts used throughout this Guide.

3.1 Who is an EA Capability Leader?

This Guide is written for a Leader – the person tasked to lead the establishment and/or evolution of an EA Capability. We have selected the term Leader deliberately to reflect the role, rather than one of the myriad titles in an enterprise the Leader may have. Key to the successful establishment of an EA Capability is the Leader's ability to step back from his or her current operational context to seek broader perspective before making a decision and then following through with the decision to lead the change.

This type of Leader takes into account multiple dimensions, like business drivers, organizational culture, and maturity, as well as the context within which his or her enterprise operates. Such a Leader is cognizant of the fact that their decisions are likely to live longer than their tenure in their current role. This person understands that there are multiple systems in play that interact with each other.

3.2 What is an Enterprise?

The TOGAF framework defines "enterprise" in the context of formal modeling. This Guide applies a different definition focused on defining the boundary of interest and activity. For the purpose of this Guide, an enterprise is the highest level of description of an organization used to identify the boundary encompassed by the EA and EA Capability.

This definition is deliberately flexible and not associated with an organization's legal or functional boundaries. It covers monolithic organizations and extended organizations that include separate organizations connected by a mission or supply chain, as well as operating entities within an organization. Examples include the outsourced partners that provide manufacturing, logistics, and other support to an organization; a multi-national peacekeeping force; and a multi-billion dollar division of a Fortune 50 firm. All are enterprises.

A given EA will align with the defined boundary of an enterprise. Whether that boundary is an exact match for an organization, a subset, or superset is not material. It is assumed that the EA Capability will align with the boundary of the enterprise and be able to deliver the EA.

An enterprise exists within a context; it has an interaction with what happens outside the enterprise. The context is different for public, governmental, or defense enterprises and private or commercial enterprises. Political, economic, social, technological, environment, and legal forces provide a context for the enterprise.

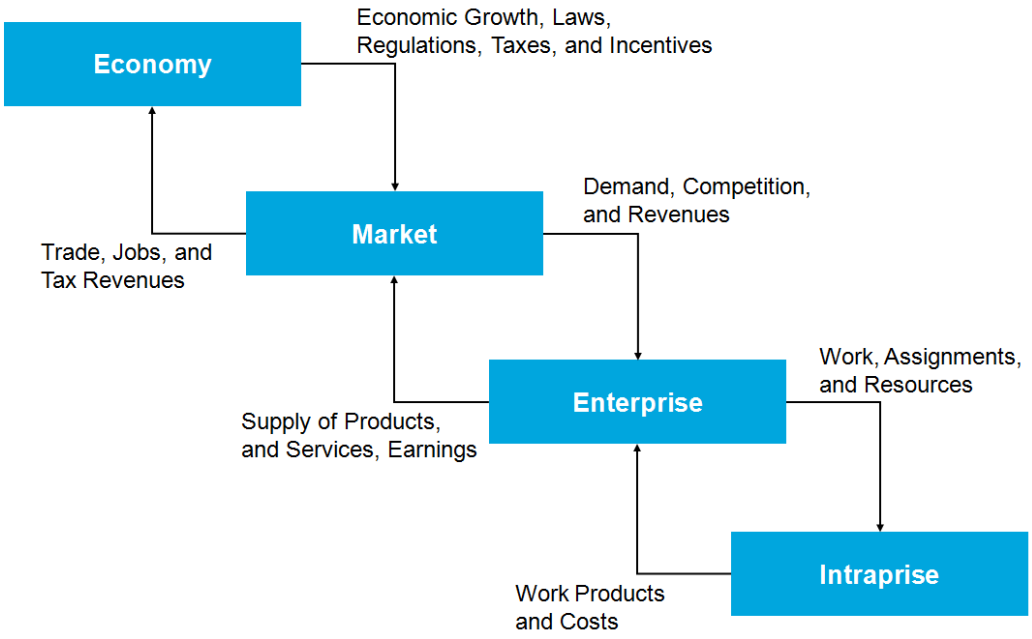


Figure 1: Context for Commercial Enterprise[3]

Public agencies, government, and defense organizations all benefit from EA. This Guide does not comprehensively address all nuances or outlier aspects for government, defense, or not-for-profit enterprises, mainly not to distract the reader with alternate methods or special focus. This Guide assumes that the reader is associated with a profit-making, publicly traded enterprise. The reader will have to make a few adjustments to context and motivation if otherwise. This Guide may in the future be updated to focus on the special needs of public organizations.

3.3 What is an EA Capability and EA?

In short, an EA Capability is the ability to develop, use, and sustain the architecture of a particular enterprise, and use the architecture to govern change.

This Guide discusses establishing and evolving an EA Capability; it explicitly does not discuss an EA department or any other organizational element. The term C*apability* is often defined tortuously, most commonly when it is used as part of a formal analysis technique when definition must be precise and constrained. This Guide uses EA Capability as a management concept that facilitates planning improvements in the ability to do something that leads to enhanced outcomes enabled by the Capability.

In its simplest terms, EA is used to describe the future state of an enterprise to guide the change to reach the future state. The description of the future state enables key people to understand what must be in their enterprise to meet the enterprise's goals, objective, mission, and vision in the context within which the enterprise operates. The gap between the enterprise's current state and future state guides what must change within the enterprise.

[3] Derived from a presentation entitled Enterprise Transformation – An Architecture-Based Approach, by William B Rouse at The Open Group Conference, January 2012.

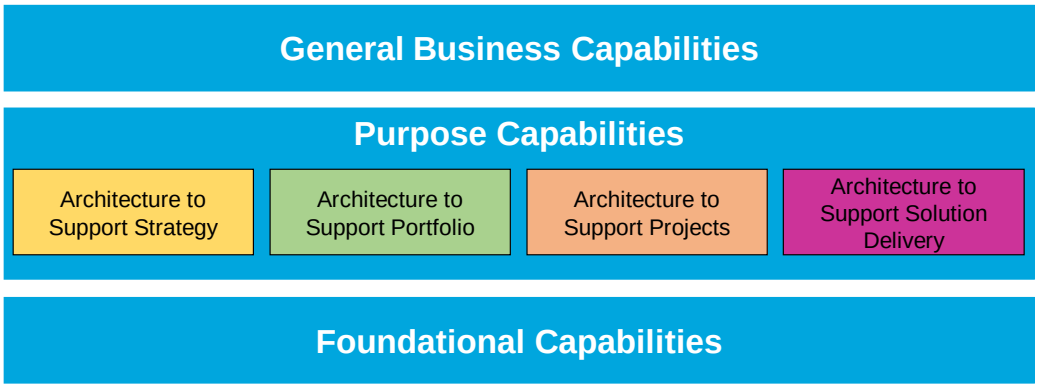


Figure 2: EA Capability Model[4]

Using the capability model in the World-Class Enterprise Architecture White Paper as a base, we assume that an EA Capability is established specifically to support one or more purposes. Typically, there are four broad purposes of an EA Capability:

- **EA to support Strategy**: Deliver EA to provide a target architecture, and develop roadmaps of change over a three to ten-year period. An architecture for this purpose will typically span many change programs or portfolios. In this context, architecture is used to identify change initiatives and supporting portfolio and programs. Set terms of reference, identify synergies, and govern execution of strategy via portfolio and programs.
- **EA to support Portfolio**: Deliver EA to support cross-functional, multi-phase, and multi-project change initiatives. An architecture for this purpose will typically span a single portfolio. In this context, architecture is used to identify projects, and set their terms of reference, align their approaches, identify synergies, and govern their execution of projects.
- **EA to support Project**: Deliver EA to support the enterprise's project delivery method. An architecture for this purpose will typically span a single project. In this context, the architecture is used to clarify the purpose and value of the project, identify requirements to address synergy and future dependency, assure compliance with architectural governance, and to support integration and alignment between projects.
- **EA to support Solution Delivery**: Deliver EA that is used to support the solution deployment.[5] An architecture for this purpose will typically be a single project or a significant part of it. In this context the architecture is used to define how the change will be designed and delivered, identify constraints, controls and architecture requirements to the design, and finally, act as a governance framework for change.

3.4 EA Lifecycle

Whether the enterprise is embarking on establishing an EA Capability for the first time, is enhancing or re-booting an existing EA Capability, this Guide provides an approach to lead the

[4] Adapted from The Open Group White Paper: World-Class Enterprise Architecture and The Open Group White Paper: World-Class EA: A Leader's Approach to Establishing and Evolving an EA Capability (see References).
[5] Delivery is the act of taking something to a place. Deployment is organizing and sending people or things to be used for a particular purpose. Architecture is supporting the act of delivery. Value is realized upon deployment and use of a solution. Hence, the difference is use of terms.

EA Capability lifecycle and maturity. In all cases, the best practice is to establish a roadmap that provides an end-state and a set of capability increments.

At the time of writing, the most common EA Capability industry practice is a re-boot after a failed attempt to establish an EA Capability. When enhancing an existing EA Capability or performing a re-boot, it is recommended to perform the activities described in Chapter 4 (Enterprise Context and EA Context) and Chapter 5 (Business Objectives for the EA Capability). These activities assist in identifying the pitfalls prior efforts ran into, and strongly influence the external Communication Plan and Roadmap. The following questions exemplify oversimplified thinking in an EA lifecycle:

- Should the EA team be created first and then develop the capability with the team?
- Are charter and sponsorship good enough starting points?
- Is the best starting point for EA practice understanding the enterprise and its external interactions or understanding the team that chartered the EA Capability team?
- Is there a need for a formal toolset at the beginning of the initiative or is back-of-napkin documentation enough?

This Guide discusses such questions as pragmatically and generically as possible to frame a proper starting point. This Guide follows a best practice approach based upon work that has established some of the most successful long-lasting EA Capability teams.

3.5 EA and Other Fields

An EA Capability is normally established in an organization to bring about changes to the current method of operation. Achieving a transformation outcome demands analysis of the current state of the organization along with current industry trends. Implementation of recommendations from such analysis requires planning, funding, and monitoring. In the course of this journey, the EA enablers interact with business strategy, cash flow management, environmental and competitive sustainability, organizational design, information and physical security, and IT and operations management to name a few spaces. Within an enterprise, many of the functions of an EA Capability will be performed, even implicitly, by several organizations.

This Guide does not take the position that a specific EA organization will perform the process and provide resources and deliverables embedded within an EA Capability. However, this Guide, in the following chapters, introduces related resources and an approach to set, build, and evolve the practice of the EA Capability. Leaders frame a charter – the extent of overlap with related functions, sharing of responsibilities, and having the necessary organizational conversations at the enterprise.

3.6 Characteristics of EA

The World-Class Enterprise Architecture White Paper highlights that there is no single correct scope, level of detail, or purpose for an EA. Different enterprises will expect their EA to guide change at different levels within the enterprise.

Herein lies a pair of substantive challenges. First, recognizing that the range, scope, and scale of an EA are as broad as the scope and scale of enterprises and their change programs. Second, the ability to develop, use, and sustain the required EA will be equally as broad. Later in this Guide, various approaches to scope (strategy, portfolio, or project), the effort, and an approach to enhance the positive impact of EA are discussed.

The purpose of EA is to optimize the enterprise to realize a specific business strategy or mission. All optimization must be responsive to change. Optimizing an enterprise to best realize the business strategy or mission requires all components to work together. Achieving competitive advantage is possible when all components are optimized to the enterprise strategy or mission.

An EA that highlights the relationship between the components of an enterprise helps facilitate effective management and exploitation opportunities. EA provides a strategic context for the evolution of the enterprise in response to the constantly changing needs of the business environment.

Furthermore, a good EA enables the sponsors and the enterprise as a whole to achieve the right balance across conflicting demands. Without the EA, it is highly unlikely that all the concerns and requirements will be considered and addressed with an appropriate trade-off.

3.7 Referenced Techniques

Within this Guide, there are references to techniques and key literature created by thought leaders. This Guide is developed using reference materials that are freely available through standards organizations and academic publications. There is no promotion or reference to any commercial techniques or tools. There is often commercial material available for topics discussed in this Guide. It is up to the reader to seek them.

References to key literature and their techniques are intended only to be representative. The reader is expected to read and assimilate referenced publications for a full understanding of these related topics. This Guide only highlights why it is used and what outcome is expected. Further, this Guide does not intend to suggest that the referenced techniques and literature are definitive. Other techniques and key literature can readily be substituted. The literature referenced is part of a body of knowledge that continuously evolves, and the reader is advised to explore updates to literature and techniques referenced in this Guide.

This Guide provides a summary of EA Content Frameworks, many of which are industry-specific, as starting points that can accelerate development of a Content Framework. See Appendix A (Partial List of EA Content Frameworks), Chapter 13 (Mapping the EA Leader's Guide to the TOGAF Framework), and Chapter 8 (Customization of Architecture Contents and Metamodel) for the discussion.)

To summarize, this Guide offers guidance on what should be considered, how to customize a version of the ADM to an enterprise context, and when to seek use of automation tools. It also provides a commentary on successful approaches to continuously evolve and grow the application of EA Capability to meet the evolving nature of the enterprise context.

Part 2: Guidance on Context

4 Enterprise Context and EA Context

To develop an EA Capability requires an understanding of the enterprise in question. The understanding gained through this exercise is the foundation for tailoring, prioritizing, and building an EA Capability. The focus of this chapter is to gain an understanding of the context and the need for an EA Capability to be built for the enterprise.

Every enterprise has a different context – the circumstances that led to its creation and current setting must be fully understood and assessed. Without an explicit understanding of an enterprise's context, there is a risk of carrying an implicit or derived context into the analysis, usually based upon prior experience or an enterprise's recent past. Proceeding with derived context often results in failure of the EA Capability. Creation of an EA Capability is often associated with change events, and must be aligned with the current context.

Questions that must be answered to have clarity about the enterprise context and an EA context include:

- What is the enterprise?
- What is the enterprise's purpose or mission?
- What is the enterprise's strategic position and approach?
- What is the enterprise's environment?
- What is the special context of the EA Capability?
- What architecture principles will drive choices?

Strategic business architecture involves understanding what the enterprise is, analyzing the purpose for the enterprise and success measures, along with its environment. Operational business architecture is about analyzing, documenting, and refining how the parts of the enterprise execute their work on a day-to-day basis.

Providing context requires strategic business architecture. Developing other capabilities uses the same understanding. Developing these descriptions is iterative. This chapter will describe why it must be iterative. The first principle of being iterative is to obtain the level of detail necessary to answer the question at hand, and, as the questions become more precise, to increase the level of detail captured.

Always revisit existing material to simply confirm that the content is current. Refine or update only when necessary. When existing principles are available, review the existing architecture principles to understand how the EA Capability has been framed regarding purpose, role, and engagement. It is too early in the process to start creating principles.

4.1 What is the Enterprise and What is its Purpose?

The very first activity is to define the enterprise. The term is defined as "the highest level of description of an organization used to identify the boundary encompassed by the EA and EA Capability". In practice, the enterprise is a boundary that identifies the outer limit that the EA and the EA Capability must address. In some cases the boundary will align with a corporation; it can align with an extended enterprise, including business partners in an organization's value chain; it can align with a set of organizations joined by a common mission, such as a multi-national peacekeeping force; lastly it can limit the boundary to part of an organization. The term is used flexibly to identify the boundary of the EA and remit of the EA Capability. The size of the enterprise is not a consideration.

What is included and excluded from the boundary of the enterprise impacts every aspect of an EA Capability. The Leader must ensure that the EA Capability addresses the complete scope of what is included the enterprise, and all related governance.

The second is to understand the enterprise's purpose. Private, public, or social enterprises will have distinct purposes. Private enterprises exist to generate value for their shareholders. The purpose will be drawn from the product and service they provide, and the industry segment in which they operate. Mission, or vision, statements will typically describe a purpose. Public and social enterprises typically have a purpose described in their mission or mandate.

Note: This Guide will operate on the assumption that the enterprise is a profit-making, public organization. This Guide also assumes that the EA Capability team is chartered to define the target architecture by the highest decision-making body (like the Board or the CEO), covering all departments, divisions, and geographies.

4.2 What is the Enterprise's Strategic Position, Approach, and Environment?

Structuring the EA Capability requires an understanding of how the enterprise works. To play in the market context, the enterprise defines how it competes and serves customers in its market – also known as the *strategic statement*. Exploring the enterprise context and the strategic position is done by understanding the following:

- Business Model
- Operating Model
- Organization Model
- Econometric Model
- Accountability Model
- Risk Management Model

Even when a strategy statement is available, the spirit and intent can be better understood by exploring these models. Development of the strategy for the enterprise rests with the Executive Board, the Chief Executive Officer (CEO), or the Chairman. The EA Capability team or its Leader may be asked to facilitate the strategy development session. The EA Capability Leader or the EA Capability team should not create or own the strategy statement of the enterprise. When

an explicit strategy statement is not available, explore the models presented below to understand whether the enterprise is operating under implicit interpretation. When the strategy is not stated explicitly or implicitly, it is upon the EA Capability Leader to request the Executive Board, CEO, or the Chairman to define the strategy.

4.2.1 Business Model and Operating Model

The business model for an organization changes to stay current with the economy and environment within which it operates. Michael E. Porter, in his 1979 article titled How Competitive Forces Shape Strategy,[6] stressed the needs to track external and internal factors. As described by Alexander Osterwalder,[7] the business model can either be a visual representation (business model canvas) or a catalog of:

- Customer segments
- Channels to reach the customers
- Value propositions brought to the customers via the products and services created by the company
- Cost structures and how product or service development is funded
- Pricing and revenue generation models
- Key partners, suppliers, and resources required to develop and deliver the products and services

The business model is an indicator of the cash flow and cash reserve management approach of the enterprise, including how it plans to stay in business for a conceivable period in the future. The smaller the financial margins, the higher the need for operational efficiency capabilities – lean but effective architecture to sustain the business. A higher profit margin is one of the several factors that results in poor sponsorship for a dedicated EA function. There are other factors like compliance, governance and risk, and challenges with long-term planning that may instigate a need for EA Capability to be built. When the team providing the EA Capability is aligned to an organizational unit that is operating as a cost function, sponsorship for the EA Capability will not be dependent on the financial margins of the organizational unit.

Identify the business model for the enterprise "as-is" today or the direction for the next few years. Business models evolve with economic and social maturity. Alexander Osterwalder discussed how disruption to an industry or a business model can be caused by altering any one of these aspects. The business model drives the selection of the appropriate operating model. As the business model changes, the operating model will have to be adjusted. Over the past few decades, as the highly inter-dependent global economy emerged, the nature of external forces and their impact on the operating model evolved as well. Some of the key literature on these forces are (see also Appendix C):

- The Living Company, by Arie De Geus
- The Structuring of Organizations, by Henry Mintzberg
- The Delta Model, by Dean L. Wilde II and Arnoldo C. Hax

[6] How Competitive Forces Shape Strategy, by Michael E. Porter (see References).
[7] The Business Model Canvas, by Alexander Osterwalder (see References).

- The Core Competencies, by C.K. Prahalad, Allen Hammond, and Stuart L. Hart
- The Fortune at the Bottom of the Pyramid, by C.K. Prahalad and Stuart L. Hart

An operating model is the conceptual representation or a description of how the enterprise executes its broad functions to achieve its stated purpose. The rationale behind how the enterprise executes its functions to achieve the stated purpose is called a business model. A pivot for a business model is the ability to manage cash flow and profitability considering how it functions, whereas an operating model is just the description of how it functions.

For example, a philanthropic organization's business model is about the activity to achieve a social goal – like availability of clean water to people hit by floods. Distinct business models would be aimed at raising funds to provide this service, put people in the field to directly deliver the social goal, or both. The operating model for this organization defines how awareness is maintained to raise money, how to respond to such needs, and to show results that the need is being met efficiently and effectively.

To get started with documenting business and operating models, consider the following pivots:

- Ownership of design of products and services, and how it is transferred to end-users
- How the products and services are charged (tactics to acquire customers)
- Diversity of products and channels employed

Operating models bridge the detailed organizational design with the strategy, values, and purpose of the enterprise. In simple terms, the operating model describes the internal expertise required and how the resources are managed to provide the services to customers of the enterprise.

There are several templates and references available for documenting the operating model – differentiated by industry or geography or by public, private, or social incorporation. It should be noted that some of the industry verticals (e.g., retail, wholesale, online, digital) have their own versions of operating model classification. The Center for Information Systems Research (CISR) model shown in Figure 3 is industry-neutral and focuses on patterns for *how* business processes are handled by the enterprise for growth and sustainability.

It is possible for the same firm to have more than one operating model. Common examples can be found in financial services or the Engineering, Procurement, Construction, and Management (EPCM) industry. A global banking and insurance company operating in, say, the United States, Brazil, and Germany may have a replication model – each country unit operates as its independent entity offering insurance and banking products and meets the needs of local demography and laws. Product design and financial structuring of these three units may replicate best practices of one another across each unit. The global holding company may be performing a coordination function to assure viability of the organization's business model to its investors.

While capturing the operating model, it is essential to explore and document the value of products or services or both delivered by the enterprise, its target market, value chain, revenue generation model, and the strategic advantage of the enterprise. Another dimension to consider while creating the operating model is the core nature of the business such as a manufacturing, marketing, sales and distribution services, professional services, community business, or public utility core nature. Value chain and revenue generation models will be covered in detail later in this Guide.

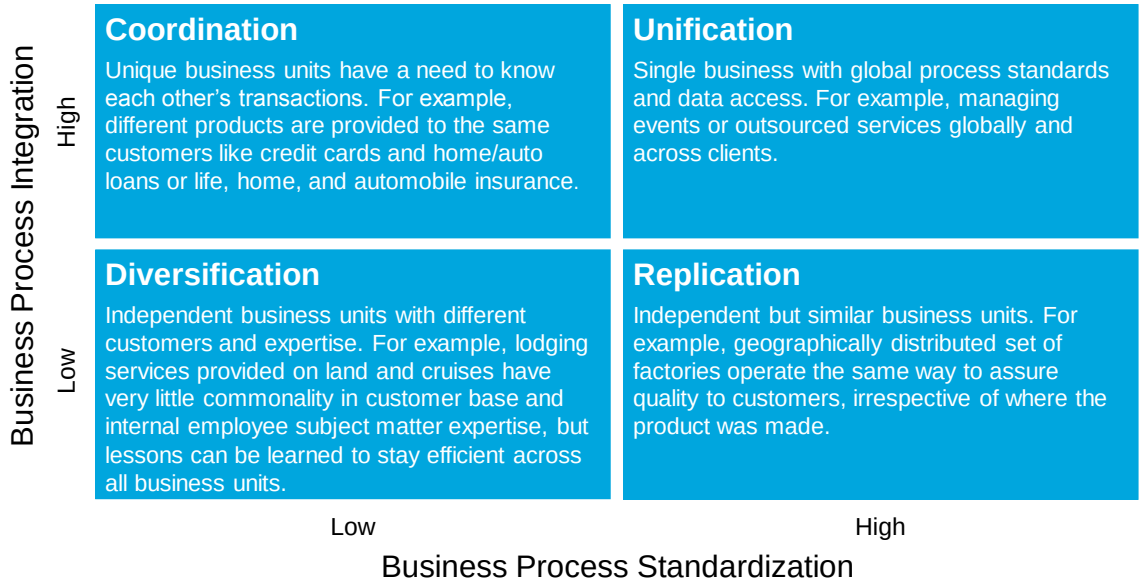


Figure 3: Operating Model[8]

The best way to capture and validate the operating model is by stakeholder analysis.

4.2.2 Operating Environment and Compliance, Regulations, Industry Standards

It is normal that the law catches up with practices of organizations to assure common good for the mass population. As innovations happen, the enterprise tends to believe that is it not under any compliance or regulatory restrictions. Though not apparent, functions like HR and finance always fall under some form of regulatory controls.

Simple research on some legal issues faced by the new enterprises disrupting global taxi operations in 2015 is an illustration of the tension between innovation, social balance, and law. An enterprise that is making new armor to protect human life is probably inventing new material for which no standards exist for mass production or testability. Just like medicinal drug formulation, this enterprise is also required to follow a protocol for development and validation before entering the live human trial phase. It is one of the responsibilities of the EA Capability Leader to educate the executives and other Leaders in the enterprise, where standards and compliance apply and where the enterprise is a pioneer if they are not acknowledging these needs easily.

It is a good practice to create a catalog of compliance needs, local and international regulations, and industry standards that apply to the enterprise.

4.2.3 Organization Model of the Enterprise

In most cases, the enterprise should have an organization model, and it is good enough for the EA Capability team to have it accessible. In the event the EA Capability's chartered scope is one business unit, product line, or geography, analysis discussed in the next few paragraphs should be limited to identifying dependencies and influences. Essentially, what the enterprise is must be defined in the context of what is being expected from the EA Capability effort.

[8] This diagram is adapted from Enterprise Architecture as Strategy: Creating a Foundation for Business Execution, by Ross et al. (see References).

An organization structure or organization model provides insights into leadership style, authority and center(s) of power, and values of the organization. It also informs lines of communication, local and global culture, segregation of duties, and resource allocations to achieve the stated mission and objectives of the enterprise. The model will provide insights into the kind of challenges the enterprise faces.

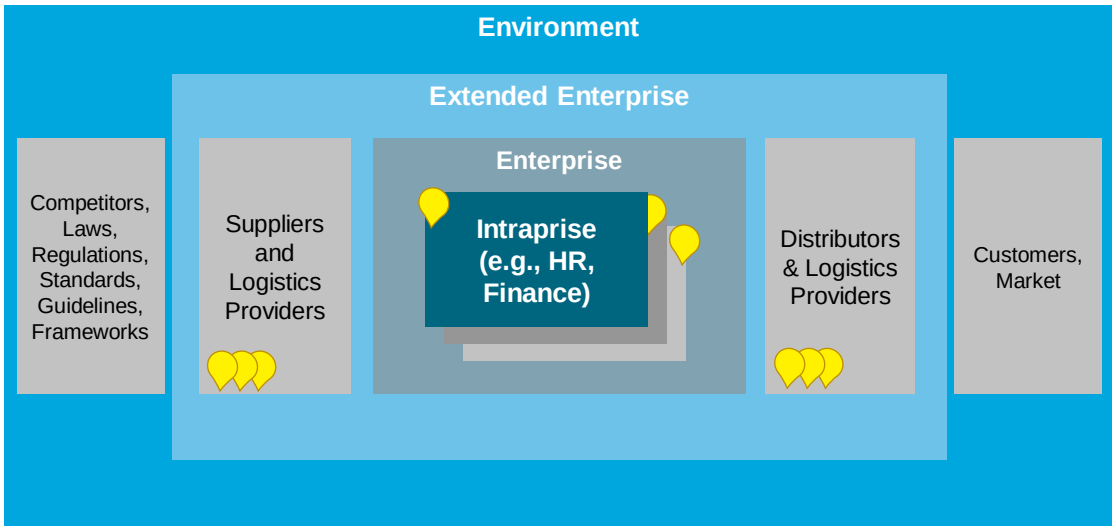


Figure 4: Extended Enterprise

Note: The yellow icons represent the geographical locations from where the teams could be operating.

Depending on the nature of business, the enterprise may be procuring raw materials or augmenting its work force via independent agents, partners, vendors, or all of the above. The Leader will have to create a catalog of key contacts and their locations for each type of "extension" to the enterprise. The version of organization model which needs to be documented may look like Figure 4, but this model is not an absolute reference.

The default organization model should reflect the lines of business or business units. Some of the other aspects to capture are locations, proximity to customer and interaction, value of innovation and data sovereignty (can employee, customer, partner, or revenue data be shared across geo-political boundaries), suppliers, and partners.

Performing an analysis of the current organization model informs how the enterprise prefers to employ human resources. Variants include grouping by skill set, by outcome, by line of business, or some by outsourcing non-essential functions. Understanding the mix of expertise and experience levels enables identification of intellectual property the enterprise wants to protect. Such analysis can be done in subsequent iterations of understanding the organization model. Creating an extended view as shown in Figure 4 will enable development of alternate viable options for business architecture or cost structure management.

A *functional organization* essentially follows Porter's value chain model: marketing, sales, order management, product design, manufacturing, customer support, finance, HR, working as separate vertical units, brought together by business processes and interface procedures. Utility service providers are likely to have this model.

A *product-based organization* is pivoted by specific product lines, and products may not overlap with each other. Common functions like HR, finance, and marketing may either be duplicated by each product line or segregated as common or shared functions of the enterprise. Each product line is likely to have its organization head, sales, order management, product design, and manufacturing functions. Governmental organizations or organizations like General Electric with diverse products are likely to follow this model.

Organizations that are heavy on *project-based* execution are likely to have a *matrix* structure – where functional skill set specialization and maturity are managed by separate Leaders and product and operational needs are championed by different sets of personnel. Each execution effort will require functional and product leaders to agree upon team size and composition to complete the task at hand.

With each iteration, understanding the organizational model, clarity will emerge about the stakeholders, decision-makers, implementers, and functions of each organization. In the first pass through of this discovery, analysis, and documentation process, insights will be directional and indicative. As the depth of understanding of the organization model increases, quality and quantity of data for organization and functions will improve exponentially. This knowledge will enable development of appropriate models and views.

4.2.4 Scope the Impacted Teams

- Identify the core – those who are most affected and achieve most value from the work
- Identify the softly associated elements – those who will see change to their capability and work with core units but are otherwise not directly affected
- Identify the extended enterprise – those units outside the scoped enterprise who will be affected in their EA
- Identify communities involved – those stakeholders who are outside the scoped enterprise, and will be affected by the outcome delivered by the EA Capability – grouped by communities of interest
- Identify governance involved – including legal frameworks and geographies

Planning horizons are discussed later, at which point this Guide will go into the details of how time impacts the depth and breadth of detailing.

The level of detail regarding motivations, goals, success measures, and operational elements like toolset, inventory, data catalog, and solution provider should be scoped to meet the purpose of the EA Capability (Strategy, Portfolio, Projects, or Solution Delivery), and the planning horizon.

If it is decided to follow the Balanced Scorecard method, it is preferable to have the financial perspective defined for the whole enterprise, although a customer perspective may differ by segment; i.e., it can carry some of the common goals for all segments. Process and learning/development perspectives should be specific to the departments or divisions with common objectives for people maturity.

As this Guide discusses the team delivering the EA Capability, it will deal with opportunities to pursue multiple capability architectures at the same time. As the transformation is executed via projects or programs, seams and glue within the enterprise will present themselves and parameters for trade-off decisions will be solidified. The process naturally becomes replicable and scalable.

4.2.5 Econometric Model

Econometrics provides empirical models to economic relations, applying observational and experimental methods. One of the areas of econometrics involves arriving at the right price for the products and services offered by the enterprise. For this Guide, discussions are limited to documenting how the enterprise defines economic value and cost of mitigating risks. Some of the sub-models that make up the econometric model include:

- **Accounting Model**: Total cash accrued = sum of sources of income – sum of all expenses.
- **Forecasting Model**: The estimation of future impact of current actions, with a given set of constrained variables or risks for income and expense. Some of the risks the company would be handling are interest rate fluctuations, currency exchange rate fluctuations, inflation, and cost of raw materials. For example, a leading low-cost airline in the US managed its operational cost by placing appropriate investments in future fuel cost.
- **Planning and Allocation**: What are the trade-off criteria applied by the enterprise to distribute its investments across the enterprise? For example, an enterprise has identified that IT investments should not be more than 3.5% of the enterprise's total operating expense to maintain its overall operational efficiency. This constraint forces a trade-off between strategic and operational IT investments.

When it comes to operational expenses and building awareness around optimizations, models like chargeback and showback can be used as needed. For example, a leading IT service management vendor suggests using a showback system as a necessary step in the path to adopting cloud services.

Therefore, from an accounting perspective, the EA Capability team should be aware of:

- Ownership of the company – privately held *versus* publicly owned
- For-profit, not-for-profit, or governmental accounting principles
- Sources of funds for the enterprise or the team that the EA effort is impacting
- Controls for spending the funds – for the enterprise, the impacted team, and the EA Capability team
- How the spending on EA is accounted for in Operating Expenditure (OPEX), cost of product development, and the Cost of Goods Sold (COGS)

Some of the other dimensions to document are how the enterprise generates revenue and profit. A few generic models are:

- Creating products using intellectual property, including leveraging others' products and services. For example, a paint manufacturer is creating a new product but uses machinery and products created by others. The formula for the paint is its intellectual property.
- Buying, stocking, and reselling products made by other enterprises. For example, a distributor sources paint and painting supplies in bulk and then distributes them to smaller businesses.

- Offering management, financial, legal, technical, or support services with thorough understanding of other organizations or industries. For example, business services organization providing logistics consulting and implementation projects.

There are other ways to look at the revenue model based on how the enterprise views itself – like commerce and retail, subscriptions and usage fees, licensing, auctions and bids, advertising, data, transactions, intermediation, and freemium. These views are variations of the first three models.

It is possible that the enterprise may handle more than one such revenue generation model. Internally, any single division never has more than one revenue model. However, it is possible for one division to generate revenue from its intellectual property while other divisions may generate revenue by offering services in technology, general management, or project management domains. In such scenarios, understanding and separating by operating models will help define the right boundaries for the enterprise impacted by the EA Capability.

Investment priorities and spending patterns for the EA Capability will depend on the appropriate revenue and accounting model of the sponsoring unit of the enterprise. As the recommendations are turned into projects or operational efforts, the business and economic model of the enterprise will play a huge part in prioritization and rollout. This Guide provides detailed insights while discussing the governance model and process model for the EA Capability.

4.2.6 Accountability Model and Decision Model

An accountability model provides a balance between the sponsorship for the EA Capability and the expectations set for the EA Capability. This understanding is key to performing trade-off decisions across the stakeholder community. For example, when a change is made in the Generally Accepted Accounting Principles (GAAP), and an expected date for compliance is set, the decision to adopt the change either on the expected date or earlier is jointly decided by the Chief Financial Officer (CFO) and Legal Counsel for the enterprise. Likewise, the decision to upgrade recommended security software on a specific machine is best decided jointly by the data center administrator and personnel from the information security team. The EA Capability team normally operates in between the layers mentioned in these examples.

There is detailed management literature and research on this subject. Every enterprise has an accountability model and decision model, and a pattern to exercise this model.

The existence of these models is often not apparent to those who are not observant. The key focus is to understand the empowerment, freedom, political, and financial support provided to different stakeholders, the Leader, and the EA Capability to navigate competing priorities.

Depending upon the inclination of the enterprise, models like SCORE and RACI can be used to identify and document roles and accountability. The Project Management Institute (PMI) proposes a 2x2 matrix shown in Figure 5, which accounts for expectations, interests, the role in EA, and the role in the EA Capability for various members within the enterprise.

Documenting the accountability matrix reflects and informs key decision-makers on various business and architectural decisions. An effective approach is to ensure the role and accountability are identified to concerns, not the project. Different aspects of the project, or concerns, will have different accountability. It is important to define the organizational and decision-making boundaries, as the EA Capability will interact with various existing disciplines.

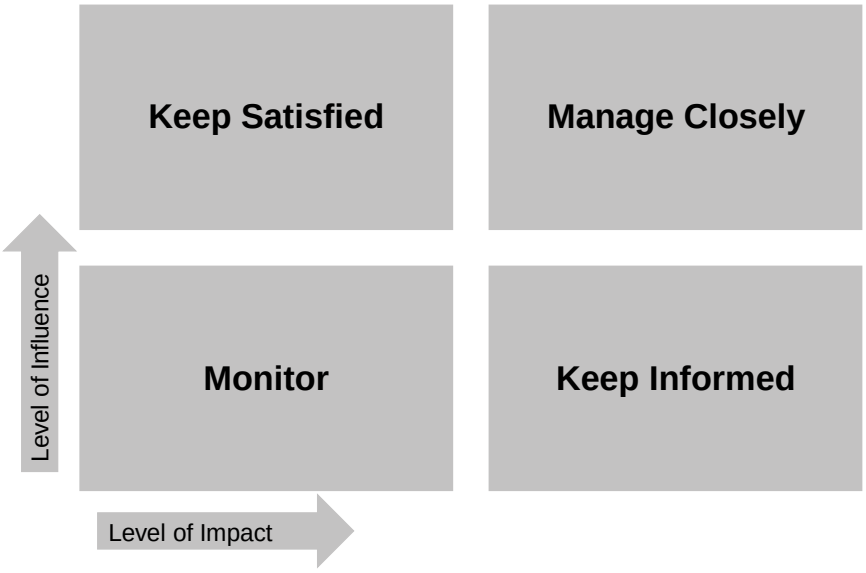


Figure 5: Project Management Institute Influence Matrix

This may be the right time to consider who would be the right person to evaluate the effectiveness and impact provided by the EA Capability.

4.2.7 Risk Management Model

Central to best practice Enterprise Risk Management (ERM) is a very precise definition of the term *risk*. Within the risk management profession, risk is understood to be the: "effect that uncertainty has on the achievement of business objectives". EA is one of the key tools that can be employed to:

- Support best practice ERM
- Reduce organizational risk
- Improve sustainability and profitability

Enterprises typically employ a formal or informal ERM framework to assess and manage risk at the enterprise level, increasing the visibility and transparency of risks to allow an enterprise's management to make decisions on how to manage risk at an acceptable level for the enterprise. One of the essential steps to set up the EA Capability is to identify the risk management framework employed by the enterprise. The risk management model employed by the enterprise may not be apparent and might require some level of investigation.

From the EA point of view, there is a need to identify the risk appetite of the enterprise. Risk is a complex area, and central to an effective EA Capability. Consider an automobile insurance provider that is exposed to anti-theft technology introduced by auto manufacturers. While accepting this new technology, the enterprise may face a reduction in auto theft, hence lower cost of claims, or it may not work, leaving the current exposure level as-is. It may choose to perform additional anti-theft research, or employ data exchange with law enforcement and its competitors to validate and mitigate the unknown impacts. Find the pattern that is used.

For example, when the architecture roadmap includes adoption of a new technology or initiates a transformation effort is accepted for implementation, how does the enterprise approach and answer the following questions:

- Using the Innovation Adoption Model shown in Figure 6, where does the enterprise fall in the bell curve? It is possible that different parts of the enterprise may fall differently in this picture. It is essential to identify and catalog them.
- What is the deviation from projected costs that is considered acceptable? (For example, 10% for the first year plan, 25% for the second and third years.)
- Which kinds and sizes of projects should go through additional layers of governance?
- If a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis is performed by the enterprise, what are the threat mitigation strategies and how are the efforts being quantified?
- Does the enterprise accept single-point failures such as vendor lock-in and interest rate variations?
- How often does the enterprise review the risks and effectiveness of mitigation efforts, and where in the enterprise are these addressed?

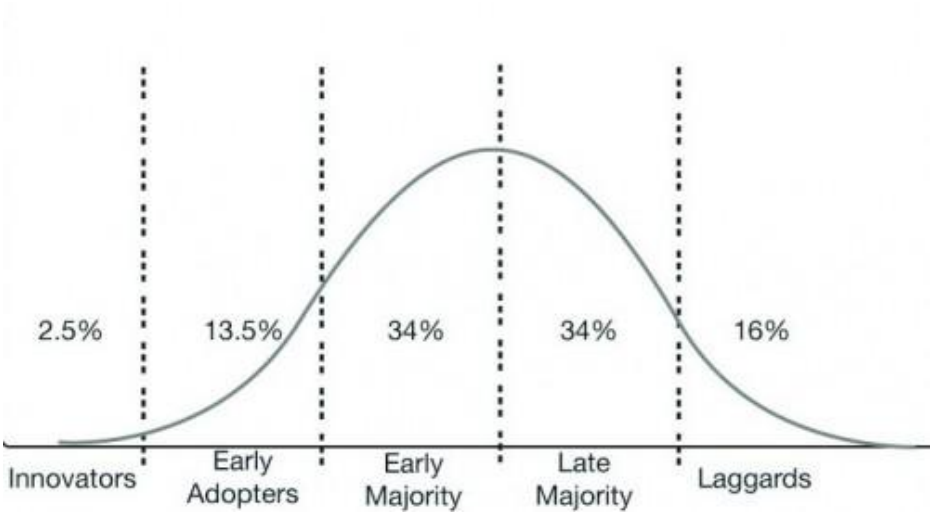


Figure 6: Everett Roger's Innovation Adoption Model (*aka* Technology Diffusion Model)

If the ERM approach at the enterprise is not clear, it is important to initiate an effort to define one. The ISO 31000 Risk Management standard and The Open Group Guide: Integrating Risk and Security within a TOGAF® Enterprise Architecture, a guide specifically developed by The Open Group Security Forum in collaboration with The SABSA Institute (see References), are starting points to do so. Through this chapter, the Leader has been advised to look at the broad enterprise context. Within the enterprise, the EA Capability will be heavily influenced by the context created by the:

- Financial Accounting Model
- Planning Horizon
- EA Principles

Understanding the enterprise's purpose evokes key dimensions to consider. These agents specifically evoke the business rhythm and delivery schedule and value proposition guidelines for transformation efforts. They are critical agents to the design of the EA organization model and what kind of expectation the enterprise has for the EA Capability.

4.3 What is the Special Context for the EA Capability?

4.3.1 Financial Accounting Model

A Leader must identify and document the financial accounting model for the enterprise. The financial accounting model supports the business model and econometric model. There are two purposes to understanding the accounting model for the enterprise. The first is that it is the model that supports the economic purpose of the enterprise. Second, the accounting model helps to understand how the EA Capability is viewed – cost *versus* revenue function, Capital Expenditure (CAPEX) *versus* Cost of Goods Sold (COGS) *versus* Operating Expenditure (OPEX), or customer acquisition function *versus* operational efficiency (risk mitigation or capacity management) function.

Some of the data points that can be derived from the accounting model are:

- An understanding of legal hierarchies – where credit-debit happens at the transactional level and where profits are accrued
- Silos and distribution of decision-makers and influencers
- Value measurement criteria for the EA Capability
- Investment amortization options while recommending projects
- Development of CAPEX versus OPEX, Return On Investment (ROI), Net Present Value (NPV), or Internal Rate of Return (IRR)-based trade-off guidelines

This list can keep growing depending on the enterprise's design, approach, and the depth of understanding of the team providing the EA Capability.

Any enterprise is likely to have more than one financial accounting model, to suit the geopolitical conditions of each of the locations. Identify the model, understand it, and leverage PMO and finance teams to formulate appropriate business case and ROI models.

4.3.2 Planning Horizon

The *planning horizon* is the number of years into the future the enterprise will project its business and investment strategies. Different enterprises will operate substantially different planning horizons for the same level of planning. Knowing that the enterprise will look one, three, five, or ten years into the future for change programs, improvement initiatives, or capital planning will directly inform the structure and process integration of the EA Capability. Aligned to purpose, the EA Capability will have to provide inputs to align with the horizon.

Each enterprise has a different appetite for its planning horizon. Keep in mind that if most of the time spent by the EA Capability is on improving the immediate future, this impairs the ability of the EA Capability to deliver value. Consider carefully the purpose and effectiveness of the EA Capability when establishing a planning horizon.

The planning horizon and refresh cycle need to meet multiple scenarios, and fidelity demands of content provides an indication of release cadence for EA work and the workload for the team providing the EA Capability. This Guide discusses some of the strategies for evolving the EA Capability to balance the effort on the planning horizon in a later chapter.

4.3.3 EA Principles

Years of experience reflect that a complete greenfield EA Capability is unlikely. Most enterprises have undertaken the initiative to establish an EA Capability more than once. In the event the enterprise has a greenfield EA Capability, the Leader should revisit this chapter after having read Chapter 5 (Business Objectives for the EA Capability). Whether EA Capability is being set up afresh or reinstated or evolved, one of the enduring guidelines is a set of EA principles.

Existing EA principles provide a special context for prior activity performed by an EA Capability. It is important to review the existing principles for two reasons. First, they provide a context of previous efforts to establish a successful EA Capability – they inform how the EA Capability was viewed, viewed itself, and what purpose it was explicitly, or implicitly, supporting. Second, to ensure that they align to the actual enterprise context for the current EA initiative. This review provides insights on how the EA Capability has been framed regarding purpose, role, and engagement.

Review questions to ask include:

- Do the existing architecture principles represent the enterprise context?
- Do they represent all organizational elements of the enterprise such as domestic and overseas, primary, and supporting activities?
- Do they represent the preferences of the organization to which the EA Capability team is, or was, aligned?

Principles will balance the enterprise context and purpose of the enterprise. Care must be taken to ensure that the principles used to inform the development of EA and change projects align to the organizational context. Care must be taken to ensure that the principles used to inform architecture development align to the organizational context.

Where the existing architecture principles do not reflect the current enterprise context nor any organizational elements of the enterprise, additional work will have to be performed in the roadmap to establish the EA Capability. At a minimum, a new set of architecture principles will have to be developed. Further, existing target architecture, compliance assessments, and roadmaps should be revisited and assessed against the new architecture principles.

A primary function of an EA Capability is to improve understanding, simplify complexity, and improve informed, consistent decision-making. By extension, architectural principles should be tied to the enterprise's values, goals, purpose, and strategies. These should inform, enable, and ground the enterprise on how to operate, transform, and grow. As a starting point, it is imperative that the team providing the EA Capability identifies and defines the situations when the consensus preference of the enterprise is to lean towards one trade-off. For example, the voice of the business outweighs the voice of the customer. Likewise, most decisions made in the context of EA are very difficult trade-off choices among two or more competing best, worst, or opposing options. A good set of architecture principles guides these choices and trade-offs.

There are four purposes for EA principles:

- **Enable decision-making** – It is important to set precedence during trade-off discussions and authority of tie-breaking if it must occur.
- **Align the enterprise** – Principles take subjectivity and bias out of the equation and drive critical conversations that are objective and aligned to the enterprise's values.
- **Governance** – How will the enterprise ensure that the right decisions are surfaced at the right time and with the right decision-makers? Moreover, how to monitor the decisions and approach taken to arrive at the decision?
- **Values and Culture** – Provide a better understanding about the enterprise's culture and values; provide an approach and insight into how well the enterprise reacts to change.

Keep in mind, anything the enterprise would perform during the normal course of business is not a principle. When the principle says "information is a valued asset", it is important to test the opposite statement "when information is not treated as a valued asset, informed decisions, and progress cannot be made", to validate whether the principle is valid.

5 Business Objectives for the EA Capability

In many regards, the two most important activities in establishing a successful EA Capability are understanding the enterprise context and the objective of the EA Capability. Too often, conversations about EA implicitly assume an enterprise context and a set of objectives. Participants in the conversation use the same words, with no common meaning, or shared expectations. Implicit assumptions invariably lead to failures. EA should endeavor to explicitly extract the enterprise context and set of objectives from the sponsor of the EA Capability, like the CEO or the CIO. Implicit deductions, though possible from certain documents, invariably misdirects the effort. Successful evolution of an EA Capability happens only when explicit alignment is continuously established and validated.

The purpose and objectives of the EA Capability will directly shape the EA organization model, the governance framework, the architecture contents, and the process model. Further, they will define whether the EA Capability is successful, or will follow the recurrent path of try, fail, and re-boot.

To have common understanding of the objectives and expectations, the following questions need to be answered:

- What is the EA Capability expected to achieve and why?
- What is the usage and application of the EA produced? For example, EA to support strategy, program, segment, capability, project, or third party.
- How is success going to be measured?
- Is the EA Capability doing the right thing for the enterprise context?
- What is the depth and breadth of the EA?
- What is the organization model of the EA Capability?

By approaching and answering questions, the purpose of the EA Capability and what it needs to be successful are framed. The Leader is in a position to separate wheat from chaff and focus on what is expected and what will be successful. Challenges regarding process integration and governance can be addressed. Challenges regarding organization model and existing resources are placed in stark relief.

Most sponsors for an EA Capability speak regarding financial goals or broad objectives (decrease cost of doing business, improve speed-to-market). Suyog Mahendra Shah[9] identifies that stakeholders may have different motivations and perspectives. The unaddressed gap between sponsors' objectives and stakeholder perspective results in failure. The thought process of stakeholders will have to be shifted from task-based or project-based to thinking regarding systems and enterprise level.

[9] The 2011 article Enterprise Architecture – Critical to Large Transformation Programs, by Suyog Mahendra Shah (see References).

A key first step for the EA Capability Leader is to play back the executive talk in explicit capabilities, go-to market approaches, or operational requirements. It is important to be specific to get alignment with the enterprise's values, goals, and strategies to have a common understanding of the objectives and expectations of the EA Capability.

5.1 What is Expected?

Where will the EA Capability team be engaged? How to validate that the EA Capability is doing the right thing?

A quick perusal of the literature on the role of an Enterprise Architect or EA Capability will leave no understanding of the role. At the extremes, the role is classified as an enabler of enterprise transformation or responsible for the selection of technical IT standards. This wide variance is responsible for most failures of an EA Capability. A mixed bag of expectations will result in improper scoping for work products and planning the evolution and development of the EA Capability.

In its simplest terms, EA is used to describe the future state of an enterprise to guide the change to reach the future state. The description of the future state enables key people to understand what must be in their enterprise to meet the enterprise's goals, objective, mission, and vision in the context within which the enterprise operates.

The gap between the enterprise's current state and future state highlights what must change within the enterprise. This gap is a function of the enterprise context and the scope of changes the enterprise sees.

5.2 What is the Depth and Breadth of EA?

Typically, there are four broad purposes[10] of an EA Capability:

- **EA to support Strategy**: Deliver EA to provide a target architecture, and develop roadmaps of change over a three to ten-year period. An architecture for this purpose will typically span many change programs or portfolios. In this context, architecture is used to identify change initiatives and supporting portfolio and programs. Set terms of reference, identify synergies, and govern execution of strategy via portfolio and programs.
- **EA to support Portfolio**: Deliver EA to support cross-functional, multi-phase, and multi-project change initiatives. An architecture for this purpose will typically span a single portfolio. In this context, architecture is used to identify projects, and set their terms of reference, align their approaches, identify synergies, and govern their execution of projects.
- **EA to support Project**: Deliver EA to support the enterprise's project delivery method. An architecture for this purpose will typically span a single project. In this context, the architecture is used to clarify the purpose and value of the project, identify requirements to

[10] Depth as used in this Guide relates to the level of detail each "purpose" architecture is scoped to explore based on its parent. Architecture for strategy scopes architecture for portfolio and cascades down. Architecture work for a particular purpose can be performed at any level of detail, although the extremes are rare. Always remember the distinction between scoping and outcome intent.

address synergy and future dependency, assure compliance with architectural governance, and support integration and alignment between projects.

- **EA to support Solution Delivery**: Deliver EA that is used to support the solution deployment. An architecture for this purpose will typically be a single project or a significant part of it. In this context the architecture is used to define how the change will be designed and delivered, identify constraints, controls, and architecture requirements to the design, and finally act as a governance framework for change.

These four purposes frame the depth and breadth of an EA Capability's operations and need to sustain an EA repository. Within the scope of the purpose, the Leader must understand what is expected from an EA Capability. Questions to ask include:

- Where in this hierarchy is the EA Capability expected to support decision-making?
- Where in this hierarchy is the EA Capability expected to support governing change activity?
- Is there a priority of focus; for example, solution deployment over strategy?
- Is there a concern that current change initiatives are failing to deliver expected value?

Consider that one EA Capability may support a strategist or functional Leader defining where the enterprise is going. Another EA Capability may take the strategist's output and support governance activity to realize the changes specified by the strategist. Questions such as the above list help clarify the nuances of the purposes mentioned above. Given that different architecture projects may address different levels of detail, the way the EA Landscape is filled will vary. If plotted on a three-dimensional graph, at any given point of time, work being executed will look like a scatter diagram.

5.3 What is the Organization Model for EA Capability?

Most enterprises have some functioning EA Capability. The EA Capability is either being purposefully evolved or re-booted. In either case, the existing EA Capability needs to be assessed against expected purpose and objectives.

Questions to ask include:

- Does the existing EA Capability deliver recommendations before the required type of decision (budget, charter/business case)?
- Does the existing EA Capability provide support for governing follow-on activity against the decision?
- Does the existing EA Capability support all the desired decisions and governance support? When an EA Capability has previously been IT-centric, it is common to have its support for decision and governance constrained to the IT domain and its involvement in decision-making artificially elevated.
- The outputs of these questions will directly impact the process alignment, governance framework, and architecture contents. The gap between the existing EA Capability and the desired EA Capability will directly feed the roadmap to evolve the EA Capability into what the enterprise desires.

The following tables, derived from the World-Class Enterprise Architecture White Paper, provide an indication of the engagement of different stakeholders with support for decision-making and governance.

Table 1 and Table 2 should be used diagnostically in conjunction with Section 10.1 (What are the Touch-Points with Existing Enterprise Processes?). The Leader will need to ensure that the EA Capability is properly aligned. The essential questions are:

- Does the EA Capability support the decision-making needs of key stakeholders?
- Does the EA Capability support the governance needs of key stakeholders?
- Does the EA Capability engage with the correct enterprise decision-maker and execution processes?

Table 1: EA Capability to Stakeholder Decision-Making Needs

Stakeholder Group	Relevance of EA Capability to the Stakeholder Group decision-making for the …			
	Strategy Purpose	Portfolio Purpose	Project Purpose	Solution Delivery Purpose
CEO	High	Low	Low	Low
Heads of Change	High	Medium	Low	Medium
Operational Executives	High	High	Low	Medium
CIO	High	High	Medium	High
Project Governance Bodies	Low	Medium	High	High
Program & Project Management	Low	Medium	High	High
Commercial & Financial Executives	Low	Medium	Low	High
Subject Matter Experts & Project Teams	Low	Low	Medium	Low
Chief Risk Officer	High	Medium	Medium	Low
Chief Compliance Officer	High	Medium	Medium	Low

Table 2: EA Capability to Stakeholder Governance Needs

Stakeholder Group	Relevance of EA Capability to the Governance activity for the …			
	Strategy Purpose	Portfolio Purpose	Project Purpose	Solution Delivery Purpose
CEO	High	Medium	Low	Medium
Heads of Change	High	Medium	Medium	Medium
Operational Executives	High	High	Medium	Medium
CIO	High	High	High	High
Project Governance Bodies	Low	Low	High	High
Program & Project Management	Low	High	High	High
Commercial & Financial Executives	Low	Low	High	High
Subject Matter Experts & Project Teams	Low	Low	Medium	Low
Chief Risk Officer	High	Medium	Medium	Medium
Chief Compliance Officer	High	Medium	Medium	Medium

As a rule, stakeholders will require different support for decision-making than for governance activity. An EA Capability that is not engaged in architecture to support strategy decision-making, but is engaged at the portfolio level, may provide support for governance activity against the strategy level. This Guide turns to the importance of alignment of the EA Capability team, given the expectations of outcomes at strategy, portfolio, project, or third-party engagement levels.

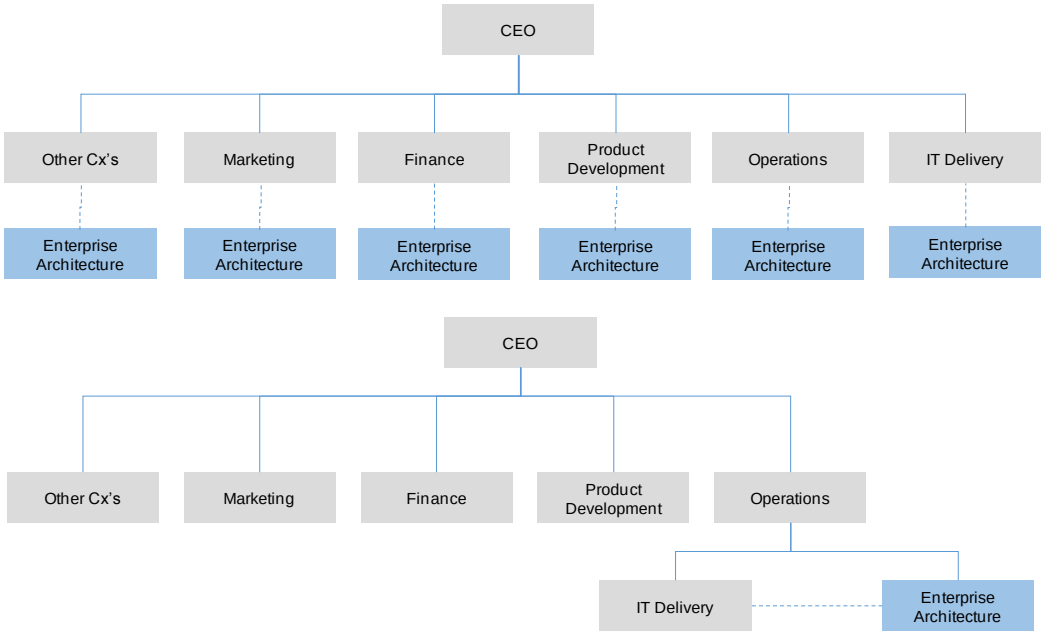
5.3.1 Alignment of EA Capability Team in the Organization Model

Most teams delivering an EA Capability today fall under one of the three variants – function-centric,[11] strategy-centric, or IT-centric, as shown in Figure 7. As with all conceptual models, there will be variations or hybrids specific to an enterprise. For example, participants in the team may be aligned to one team, and the contributing members may be aligned with line of business (function-centric) teams.

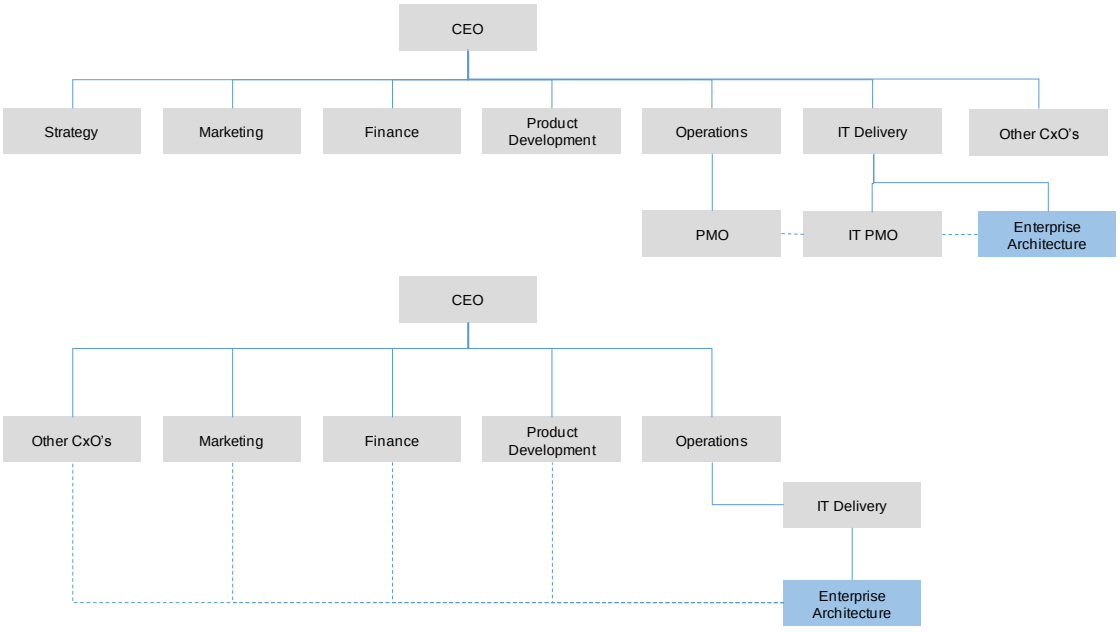
[11] Successful Leaders are linguistically nimble. Often particular techniques place extreme pressure on a word. Technique practitioners will instinctively defend the technique's value by defending the specialized use of key terminology. The term "function" is one such word.
This Guide distinguishes between words used in a general manner and when a specialized meaning is required. For "function", this Guide relies on a general meaning, referring to elements of an organization such as HR, Finance, Sales, Plant Management, and Operations as functions. See Section 4.2.3 on the function-based organization model or Merriam-Webster Dictionary's first meaning for function: "the special purpose or activity for which a thing exists or is used".
Successful Leaders need to be able to seamlessly switch back and forth between the specialized language of particular techniques and the generalized language of everyday communication.

The initial scope and impact of the EA Capability varies based on the model that is being followed in the enterprise. This alignment will impact the constitution of the architecture review board, governance model, and time to realize value.

Function-Centric EA



IT-Centric EA



Strategy-Centric EA

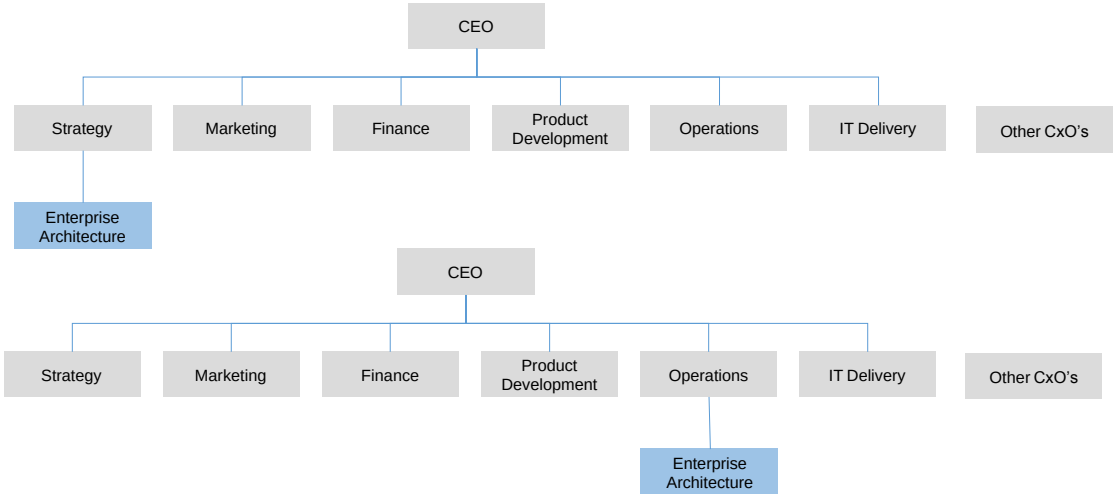


Figure 7: EA Team Common Organizational Placements

Each model supports a different set of objectives, empowerment, and constraints for the EA Capability team, as they are reflections of the outcome expectations from the EA. Having such a model does not preclude the charter for a team providing the EA Capability from addressing other aspects. When the expectation is such, there exists a possibility for alignment hierarchy for the EA Capability team to shift from one model to another as objectives and strategies change. The Leader must be cognizant of a coherent or mixed bag of expectations and charter to define appropriate execution methods.

A high-functioning EA Capability requires cross-discipline function behavior and engagement in other processes of the enterprise. These processes include corporate governance, fiscal control, customer and stakeholder engagement, and project management. Further, Martin van den Berg and Marlies van Steenbergen (2006)[12] highlight the need to cover individualistic architect functions like consulting, mentoring, commitment, motivation, and persistence. The EA Capability team must have sufficient capacity and diversity of domain knowledge, soft skills, and context to be successful.

5.4 How is Success Going to be Measured?

The enterprise's objectives directly translate into metrics for the EA Capability and are directly derived from the purpose of the EA Capability. Some metrics will be operational health while others will be derived from the enterprise's scorecard or strategy.

Recognize that not all EA Capability objectives are tangible and readily measurable. Consider an insurance company that says: "we need an architecture to make all of our customers be our promoters". This statement applies to the entire enterprise. Though it appears measurable, dimensions like type of customer (enterprise *versus* single human), neutrality, or cultural differences should be accounted for to arrive at specific measures. Likewise, it is possible that folks in the team providing the EA Capability, including the Leader, have some ideas that could appear relevant, immediately actionable, and to be common sense. Including such ideas in the

[12] Building an Enterprise Architecture Practice: Tools, Tips, Best Practices, Ready-to-Use Insights, by Martin van den Berg and Marlies van Steenbergen (see References).

list of objectives without validation is one of several death traps for EA Capability. Be prepared to embrace such objectives and classify them accordingly, before converting them into measures.

Some of the objectives may have to be met by other functions in the enterprise. Given the objectives and purpose, care must be taken to align processes, the organizational model, and governance. One of the many death traps for an EA Capability is confusing "supporting decision-making" with "decision-making". Consider an EA Capability that supports strategy: a team member lobbying to defund an effort considered risky has confused sound advice with ownership of the decision. This conflict is most common in IT-centric EA Capability and plays out in efforts to achieve elevated decision-making power without commensurate outcome responsibility. Confusing supporting a decision with empowerment and governance is simply wishful thinking.

Define success measures that reflect the level of empowerment, quality of outcome delivered, and impact expectations of the sponsor. For example, Gartner signals that EA Capability should present leadership with signature-ready recommendations. What kind of measure should a Leader attach to such an execution model?

Some questions that yield a wealth of insights to define the measures are:

- What would the enterprise do if the EA Capability did not exist?
- How will the enterprise track benefits realized at different levels of decision-making?
- Executive management is a directive function, and EA Capability is an advisory function. How do we measure the value of good advice?
- What would happen when EA Capabilities have a limited ability to deliver? In general, increased risk and lower levels of value created. Measures may be instability within the business, lower profits, poor investment success track record.
- How will benefits from mature EA Capabilities be realized at different levels of decision-making? How many recommendations have been accepted by decision authorities? What is the track record of risk identification and mitigation? Has the level of governance been commensurate with the business benefits to be realized?

Further, is the EA Capability being set up in response to a problem? The success measures will vary with the nature of the problem being solved. Common examples of problems to be solved include:

- Struggling expansion via Mergers and Acquisitions (M&A) and divestitures
- Stalled strategic growth in a specific market segment
- Impact of disruption
- Restructuring or retooling the enterprise
- Investor confidence problems from operational cost or unrealized R&D spend
- Inability to decide through information, communication, and technology complexity
- Inability to decide the balance of future gains against compromising business-as-usual
- Fear of recurrence of recent upheavals in supply chain, security, or IT project

- Perceived disruptive changes in operational practice (automation, cloud, outsourcing)

5.4.1 Revivalist and Bottom-Up EA Capability

It is easy to get caught in recurrent cycles of trial and error which ultimately repeat themselves when attempting to re-boot an EA Capability. In a re-boot or bottom-up scenario for EA Capability, it may often seem that the Leader is given the luxury to obtain answers to the questions the sponsors are identifying, albeit without budgetary support. Sometimes a change Leader gives the explicit sponsorship to make the enterprise a better place.

With bottom-up approaches, the challenge is to identify and deliver value to key decision-makers who have a passion to change the organization. If this is not accomplished from the outset, it is better to wait for decision-maker interest to align in the future. Attempting to deliver value before buy-in, in a bottom-up or self-initiation, though prevalent models, has wrought many challenges, as the Leader must act upon interpretation and assumption. When what is delivered is not valued by the potential sponsor, not only has the EA Capability team failed again, the team has wasted valuable resource. At a minimum, it is strongly recommended to understand the enterprise context and develop a value proposition to those in the enterprise who will sponsor a reviving EA Capability. It is strongly recommended to get proper buy-in, including financial allocation and resource commitments, before attempting to pursue a bottom-up approach to establish the EA practice. The Leader has to dig deeper for the reasons that prompted a need to re-initiate the effort. Consider the questions and answers about enterprise needs very carefully. Most of all, assume that the goal is to make the enterprise a better place.

The following are themes that can be used to deliver value and make the charter clear:

- Theme of "*foundations for future scale*": Creating an implementable effort – like integrating disparate systems or enabling flexibility to update systems and applications independent of each other with a well-defined investment and timeline.
- Theme of "*function clarity*": EA is about enablement and realization of alignment of business and technology functions. EA is not about monopolizing any one function. It is about collaborative success. Create a charter and communicate terms of collaboration and collective success.
- Theme of "*risk reduction*": The very act of involvement in an economic activity is risky. The probability of occurrence and impact is what constitutes outcome. Building a story from a recent "incident" that could have been avoided with the EA Capability, articulating a pattern providing cost avoidance, and minimizing impact on future occurrence.

It is imperative that the Leader validates the enterprise context and objectives of the EA Capability periodically. Every enterprise exists in a dynamic environment. It is important to check the purpose for each planning cycle that the EA Capability team supports. It is essential that the Leader checks the objectives and context once in the planning cycle and again in the middle of the cycle. Best practice EA is a continuous, adaptive, incremental, and iterative process.

Carve out an EA Capability that can succeed and thrive in the enterprise. Use the knowledge from understanding the context for the enterprise. If failure happens in the first attempt to make the business case, consider rebuilding the case after reading through Section 11.2 (Linking the EA Value Map to the Enterprise Value Map) and Chapter 12 (Establishing and Evolving the EA Capability).

Part 3: Guidance on Structure

6 Architecture Governance

The development and use of EA must be governed.

This Guide now turns to the enterprise's approach to decision-making, direction, and control. It discusses the process of governance, roles, and responsibilities as they pertain to the architecture process model in Chapter 10 (Process Model). Governance (decision-making, direction setting, and control) is addressed so early in this Guide to have clarity on the objectives. From this point onward, every action a Leader takes should be validated against this objective to stay relevant and focused on the outcome – not the ceremony of activities to be performed. A Leader should be very clear on what to report and to whom.

It is likely that the existing governance and support models of an enterprise will need to change to obtain the most value from the EA Capability. Understanding the enterprise's required architecture governance requires the following questions to be answered:

- What is the reporting framework?
- What is the decision-making approach?
- What is the risk management approach?
- What is the enterprise's approach to governance?

It is important to understand that governance applies to the development of a target architecture, how that target architecture governs change, and how the target architecture evolves.

6.1 Introduction to Governance

ISO/IEC 38500:2015[13] defines governance as: "a system that directs and controls the current and future state". The process by which direction and control is provided should take into account equality of concern and transparency, protecting the rights and interests of the business.

Governance is a decision-making process with a defined structure of relationships to direct and control the enterprise to achieve stated goals. The key difference between governance and management rests on the cornerstone of fiduciary and sustainable responsibility. To define a customized governance approach, let us start to define the following:

- What is to be governed?
- Why should something be governed?
- When and who should decide on the recommended alternatives?
- How does this link to the EA process discussed in Chapter 10 (Process Model)?

[13] ISO/IEC 38500:2015: Information Technology – Governance of IT for the Organization (see References).

Common mistakes to avoid are "fixing the blame" and "warned you before" processes and allowing weak policies that are focused on narrow-minded interests instead of securing the interests of the enterprise.

6.1.1 Key Characteristics

The following characteristics have been adapted from Corporate Governance by Ramani Naidoo[14] and are positioned here to highlight both the value and necessity for governance as an approach to be adopted within organizations and their dealings with all involved parties:

- **Discipline**: All involved parties will have a commitment to adhere to procedures, processes, and authority structures established by the enterprise.
- **Transparency**: All actions implemented and their decision support will be available for inspection by authorized enterprise and provider parties.
- **Independence**: All processes, decision-making, and mechanisms used will be established so as to minimize or avoid potential conflicts of interest.
- **Accountability**: Identifiable groups within the enterprise – e.g., governance boards who take actions or make decisions – are authorized and accountable for their actions.
- **Responsibility**: Each contracted party is required to act responsibly to the enterprise and its stakeholders.
- **Fairness**: All decisions taken, processes used, and their implementation will not be allowed to create unfair advantages to any one particular party.

Governance is about a hierarchy of decision-making that everyone commits to. Governance can be used to drive a set of behaviors. The act of observation by the governance team should not change the fact or how something is done. An observation results in some form of measurement. Define a set of measurements and metrics that can be used to achieve organizational objectives. Being transparent about why the measurement is being made and what mitigation options are available will drive positive behavior. Revisit the previous chapter to fine tune what to measure and why that measurement is needed.

Identify and define appropriate governance tiers to align what, how, when, and which tier gets escalated for relief. Absence of relief within each tier will result in loss of effective control and local autonomy. In general, lower tiers tend to be tactical in scope. Cross-cutting or higher tiers constrain lower tiers.

It is likely that the enterprise already has processes defined for some or all of the tiers shown in Figure 8.

[14] Corporate Governance: An Essential Guide for South African Companies, by Ramani Naidoo (see References).

Figure 8: Potential Governance Tiers

6.2 Essential Governance

A common failure pattern is to establish an EA governance board that believes it maintains decision rights about the target architecture, change to the architecture, relief, and enforcement. Decision rights about the target architecture, relief, and enforcement are always vested in the architecture's stakeholders. Successful teams providing the EA Capability make sure that even within the lowest tier (technology architecture governance), stakeholders own the decision rights. An EA governance board owns process, and a recommendation regarding completeness and confidence in the work that led to the target architecture.

The short decision-tree checklist for an EA board to require an architect to answer when assessing a target architecture is given below. Note that it may sound natural to start anywhere on this checklist or pursue answers to these questions simultaneously. Experience has shown this approach to create more work than making governance invisible; however, it has proved to be effective. Notice the choice of words at the beginning of the paragraph. This is a "decision-tree" presented in free flow text format for readability. All questions are mandatory. As in any decision-tree, a negative response may force you to re-enter the tree at a higher level.

1. Were the correct stakeholders identified? Y/N
    a. If yes, proceed.
    b. If no, direct the architect to engage with the stakeholders appropriate to the scope of the architecture being developed.

2. Were constraints and guidance from superior architecture taken into account? Y/N

    a. If yes, proceed.

    b. If no, either exercise architecture governance to change superior architecture, obtain relief, or enforce the architecture by directing the architect to take into account guidance and constraints from superior architecture.

3. Do appropriate subject matter experts agree with the facts and interpretation of the facts in the architecture? Y/N

    a. If yes, proceed.

    b. If no, either direct the architect to engage with the subject matter experts or develop a recommendation for the stakeholders that they should have limitations in confidence.

4. Do any constraints or guidance produced reflect the views produced for stakeholders and any underpinning architecture models and analysis? Y/N

    a. If yes, proceed.

    b. If no, direct the architect to do their job.

5. Do the views produced for the stakeholders reflect their concerns and reflect any underpinning architecture models and analysis? Y/N

    a. If yes, proceed to the stakeholders for approval.

    b. If no, direct the architect to develop appropriate views.

6. Do the stakeholders understand the value, and any uncertainty in achieving the value, provided by reaching the target state? Y/N

    a. If yes, proceed.

    b. If no, direct the architect to develop appropriate views and return to the stakeholders.

7. Do the stakeholders understand the work necessary to reach the target state and any uncertainty in successfully accomplishing the work? Y/N

    a. If yes, proceed.

    b. If no, direct the architect to develop appropriate views and return to the stakeholders.

8. Do the stakeholders understand any limitations in confidence they should have in the target architecture? Y/N

    a. If yes, proceed.

    b. If no, direct the architect to develop appropriate views and return to the stakeholders.

9. Have the stakeholders approved the views? Y/N

If the answer to the last question is yes, the EA board should approve the architecture for publication in the EA repository as the approved target architecture. Because the failure pattern

is so embedded in practice we will re-iterate: there is no role for the EA governance board to debate, or approve, the contents of the target architecture and its constraints or guidance.

If the answer to the last question is no, the EA board should make a decision to either direct the architect to re-work the architecture usually through more advanced trade-off, or more often embracing the stakeholders' preferences, or cancel the architecture initiative.

When the architecture is being used, changes to the enterprise are being guided, or constrained. Two factors impact governance of change. First, organizations operate in a dynamic environment, and the analysis of the target architecture cannot have assessed every circumstance or change option possible. Second, the target was produced for a purpose and may not have been developed to the level of detail required for the current use. The governance process requires the ability to change the architecture, provide relief from constraint, and enforce the architecture.

The role of EA governance is to manage the process of assessing compliance. All change is subject to compliance reviews against the constraints and guidance in the target architecture. Typically, these assessments are performed on a periodic basis to assess the operationally changing current state, and associated with a project to assess project-driven change. Where there is non-compliance, the stakeholders have three choices: first, enforce compliance; second, provide relief; and third, change the target architecture.

The short checklist for an EA board to require an architect to answer when assessing a non-compliance report is:

1. Did the organization embarking on a change reasonably interpret the target architecture's guidance and constraints? Y/N
    a. If yes, their interpretation should be accepted as compliance and any issues addressed through a change to the architecture.
    b. If no, proceed.
2. Do appropriate subject matter experts agree with the facts and interpretation of the facts in the impact assessment? Y/N
    a. If yes, proceed.
    b. If no, either direct the architect to engage with the subject matter experts or develop a recommendation for the stakeholders that they should have limitations in confidence.
3. Do appropriate subject matter experts agree with the recommendation to enforce the target, grant time-bound relief, or change the architecture? Y/N
    a. If yes, proceed.
    b. If no, either direct the architect to engage with the subject matter experts or develop a recommendation for the stakeholders that they should have limitations in confidence.
4. Do the views produced for the stakeholders reflect the impact assessment and reflect any underpinning architecture models and analysis? Y/N
    a. If yes, proceed to the stakeholders for approval.
    b. If no, direct the architect to develop appropriate views.

5. Do the stakeholders understand any limitations in confidence they should have in the impact assessment? Y/N

    a. If yes, proceed.

    b. If no, direct the architect to develop appropriate views and return to the stakeholders.

6. Do the stakeholders understand the impact on prior expected value, and any change in certainty in achieving the value, provided by reaching the target state? Y/N

    a. If yes, proceed.

    b. If no, direct the architect to develop appropriate views and return to the stakeholders.

7. Have the stakeholders approved the recommendation to enforce the target, grant relief, or change the architecture? Y/N

If the answer to the last questions is yes, the EA board should approve the non-compliance action recommendation for publication in the EA repository. Because the failure pattern is so embedded in practice, we will re-iterate: there is no role for the EA governance board to debate, or approve, the recommendation. Lastly, where relief is provided, the EA board should ensure that future compliance assessment and reporting take place to review time-bound relief. Without this step the enterprise has simply agreed to change the target architecture without the bother of an approval.

If the answer is no, the EA governance board has a difficult decision. In short, either the architect must be directed to expand the information provided to the stakeholders, or re-work the recommendation to embrace the stakeholders' preferences.

Design of the EA governance two essential practices must be done in the context of the enterprise's existing governance, reporting, and ERM practices.

6.3 What is the Current Reporting Framework?

Redrawing the existing processes to showcase various interactions happening in an enterprise will help identify what should be governed. Figure 9 shows possible governance boards that exist in an enterprise to manage internal and external interactions. These interactions impact the business and hence the EA. These interactions result in exchange of information within and outside the enterprise, brokered via different mediums. Each kind of information dissemination or consumption could enable value or pose risk. The governance framework defines who will direct and control what kind of information exchange and when.

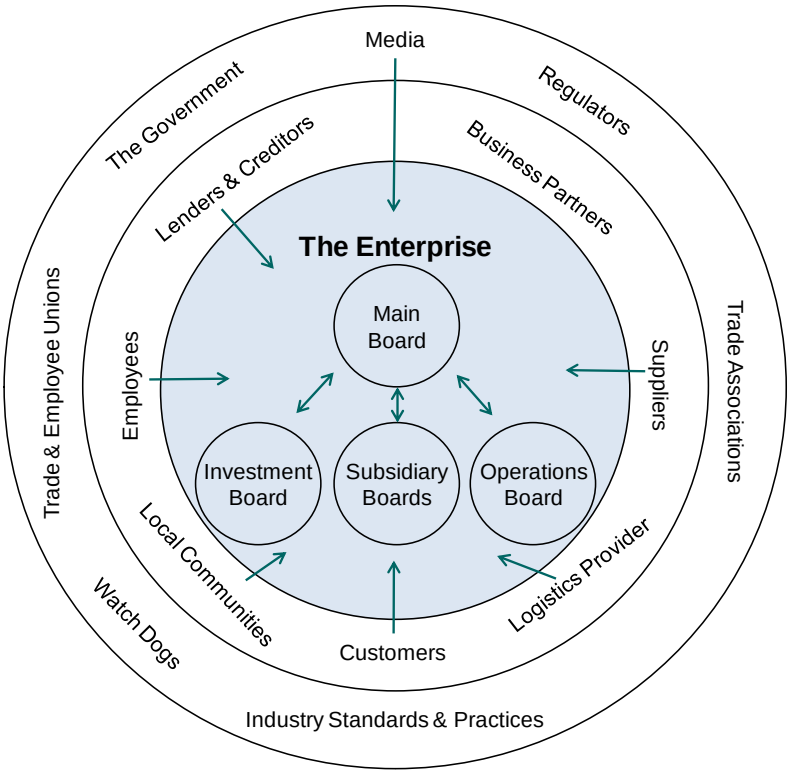


Figure 9: External and Internal Interactions Affecting Governance[15]

The governance framework should balance the needs of tactical and strategic operations of the enterprise. The enforcement responsibility and organizational level where enforcement happens will vary based on the charter for the EA Capability. The first step is to confirm the existence of existing governance mechanisms as shown in Figure 9, and determine which can be leveraged to include EA governance. At times, it may be possible to change the charter of an existing governance body to include architecture governance. In TOGAF terms, the architecture governance body is called the architecture board. The rest of the discussion in this chapter applies whether a Leader is creating a new or leveraging an existing body.

Governance is comprised of mechanisms, processes, and teams through which architects and stakeholders articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences. The objective is to create a sustainable environment for inclusive and responsive processes to achieve the goals of the enterprise, mitigating all risks. To govern effectively and efficiently, basic policies, principles, and rules should be identified, created, and published. Having a set of architecture principles, standards, reference architectures, and best practice defined is useful. The principles defined should be commensurate with the size, complexity, structure, economic significance, and risk profile of the enterprise's operations.

6.4 What is the Current Risk Management Approach?

A central role of the EA Capability is to facilitate creation of an environment where operational risk can be optimized for maximum business benefit and minimum business loss. This requires close integration with the enterprise's risk management approach and an understanding of the

[15] Adapted from Applied Corporate Governance (see References).

scope and interests of Enterprise Risk Management (ERM). Tight integration with ERM facilitates tilting the EA to improve realization of objectives, and the reduction of uncertainty.

Consideration of ERM in the context of governance is driven by the foundation that governance is a decision-making process, with a defined structure of relationships to direct and control the enterprise to achieve stated goals. The process by which direction and control is provided should imbibe equality of concern and transparency, protecting the rights and interests of the business.

The most common understanding of risk is derived from Information Security Management (ISM), which is largely focused on mitigating threat and vulnerability. While ISM is important, a broad understanding of ERM is required. Detailed understanding of risk and risk management can be gained from The Open Group White Paper: TOGAF® and SABSA® Integration.[16]

Central questions that need to be answered are:

- What is the enterprise's risk appetite?
- What is the enterprise's risk tolerance?

Associated governance questions include:

- Who agrees to a risk assessment?
- Who agrees to a risk treatment plan?

6.4.1 What is Risk?

The heart of effective risk management is managing to the expected objective. Every activity, operational activity, and change activity has an element of risk that needs to be managed, and every outcome is uncertain. Risk management is about reducing uncertainty. The ISO 31000 Risk Management standard definition of risk is the "effect of uncertainty on objectives". The effect of uncertainty is any deviation from what is expected.

Uncertainty typically involves a deficiency of information and leads to inadequate or incomplete knowledge or understanding. In the context of risk management, uncertainty exists whenever the knowledge or understanding of an event, consequence, or likelihood is inadequate or incomplete.

The EA Capability is focused on where the enterprise is going, and its path to change. A different future, and the changes required to realize such a future, are intertwined with the "effect of uncertainty on objectives". This requires close integration with the enterprise's ERM approach. Inherent in strong risk management is striking the balance between positive and negative outcomes resulting from the realization of either.

6.4.2 Core Concepts of Enterprise Risk Management (ERM)

The definitive standard for Enterprise Risk Management (ERM) – the ISO 31000 standard – outlines a risk management approach to aiding decision-making by taking account of uncertainty and the effect of this uncertainty reaching the enterprise's objectives. Following the ISO 31000 standard approach ensures that risk management is embedded deeply and firmly in all business activities. It also states that it is a continuous lifecycle rather than an isolated activity.

[16] TOGAF® and SABSA® Integration (see References).

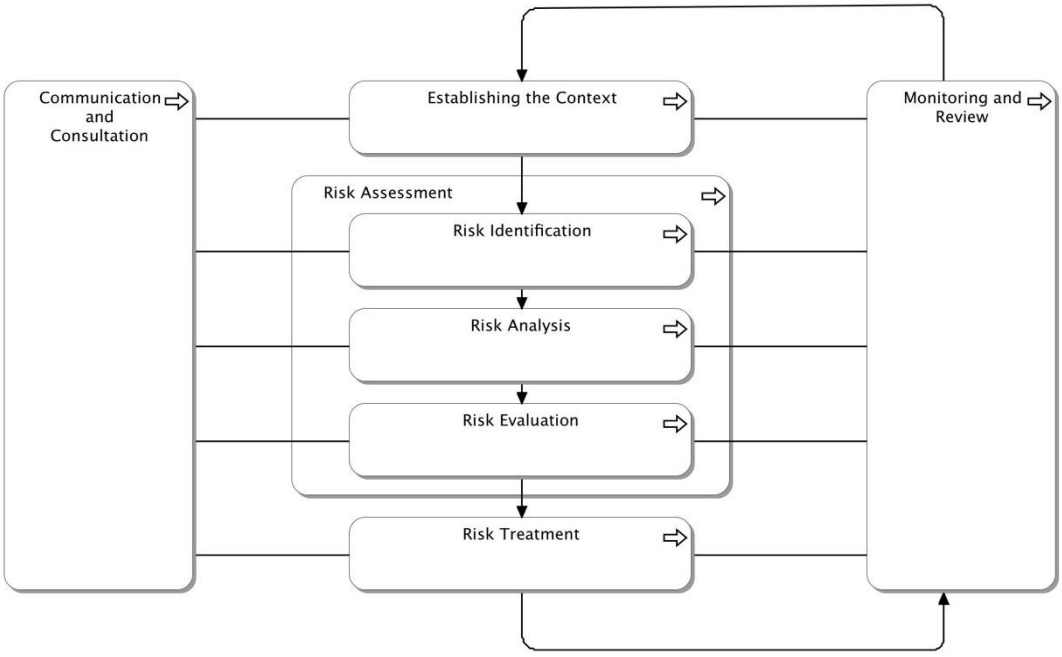


Figure 10: The ISO 31000 Standard Model for Risk Management[17]

6.5 Existing Governance Process

The process should be documented in such a way that information about when and which approval, enforcement, and relief mechanisms should be deployed should be as self-explanatory, transparent, and effective as needed. In selecting an existing governance body, consider the simplicity of process and its effectiveness.

At all levels of the governance process, it is essential that measurements, metrics, and rationale for relief be defined in business terms. Governing a portfolio by number of machines eliminated does not relate itself to a business outcome. Translate to something like cost optimization for the same operational capacity.

It is possible for a perception to exist in the enterprise that EA exists as an ivory tower or as an overhead organization, especially when EA is being re-booted after a failure. To not follow the rules in the first paragraph of this chapter would probably provide the reasons for such a perception. It is OK to go to market with full awareness and a plan for risk mitigation within the context of the enterprise's appetite and tolerance for risk instead of recommending "stoppage" of work against a theoretically risk-free approach. It is better to be ahead of the curve and influence the selection of better and viable alternatives during the feasibility study or initiation of an effort. Define the governance process so that it can achieve delivery proactively.

Governance often results in a change, either to current effort or future efforts. Organizational and architecture change management should account for triggers and provide a timeline to implement the change from governance decisions. Imagine opening a faucet for hot water in the morning. Other control mechanisms sense the opening of the faucet, and it takes a while for the hot water to start flowing out of the faucet – flushing out the cold water in the line. Governance

[17] Derived from the ISO 31000 Risk Management standard (see References).

operates in a similar way at times, and its process should also account for long lead times for corrective actions to take effect.

All governance decisions and scope are not the same – for example, business architecture decisions will impact operational processes and cost, or when the goal has to be restated, scope of impact and governance decisions are the same. Nor will the level of decision-making – operational to strategic – impact the scope of change.

6.5.1 Definition of Roles

Roles define those who get to participate and their span of control in which tier should be identified and defined. Just like the differences in skill set and approach to developing architecture and managing architecture, there are differences in execution style between architecture governance and management. Architecture management involves the development of policies and standards and the recommendation of scenarios under which they should be applied. This keeps the governance body informed of the context of the impact of architecture in a concise format.

There is an important distinction in practice. The governance body approves the policies, standards, and rules recommended by the architecture management team for the EA Capability, but does not approve the architecture. Only the set of stakeholders can approve an architecture and roadmap. An EA Capability governance body focuses on ensuring the process was followed; the appropriate stakeholders were engaged, and the materials produced are internally consistent. It is the responsibility of the EA Capability Leader to differentiate the role of these functions and identify qualified personnel. It is common that the functional head of an EA Capability is not the head of the architecture governance body.

7 Alignment with Other Frameworks

The TOGAF framework is one of several major frameworks used by most enterprises for architecture development. Alignment and interaction with other major enterprise frameworks is required for assurance of outcome and governance. These enterprise frameworks approach the enterprise with a different focus, purpose, and terminology.

This step requires the following questions to be answered:

- Is there a precedence of enterprise frameworks?
- What is the depth of commitment to different enterprise frameworks?
- How does the TOGAF framework fit in?

Getting stuck on semantics between definition of a framework, method, and technique at this point has stalled several EA Capability improvement initiatives. Avoid this pitfall and focus on creating a mapping to answer the questions above. The purpose of this activity is to identify how the enterprise approaches planning, execution, and governance functions and how committed the enterprise is to these approaches, how established the approaches are, and how it thinks about itself.

7.1 Create a Catalog of Frameworks

The first step is to create a catalog of such frameworks and their area of focus. This catalog should focus on planning and execution (Project Management Institute (PMI), PRINCE2, Six Sigma), information systems governance and operation (Lean, COBIT, ITIL), and management and measurement frameworks (Balanced Scorecard and SABSA Enterprise Risk). It is important to also include industry-specific frameworks (SCOR and eTOM) and industry-specific architecture content frameworks (BIAN, DoDAF, DNDAF) that provide a view of business process and capability and an architecture description.

Group the frameworks against the econometric, accountability, and execution models like risk, accounting, and planning. The grouping may create an overlap view similar to Figure 11. Rationalize what is needed from each framework, method, or technique for effective operationalization of recommendations from the EA Capability (attaining the target state).

All mapping exercises require understanding of an enterprise's depth of commitment to an approach. Many enterprises pay lip-service to a framework, adopting a few terminology elements and skipping substantive change. Focus all analysis and alignment on frameworks to which the enterprise is committed.

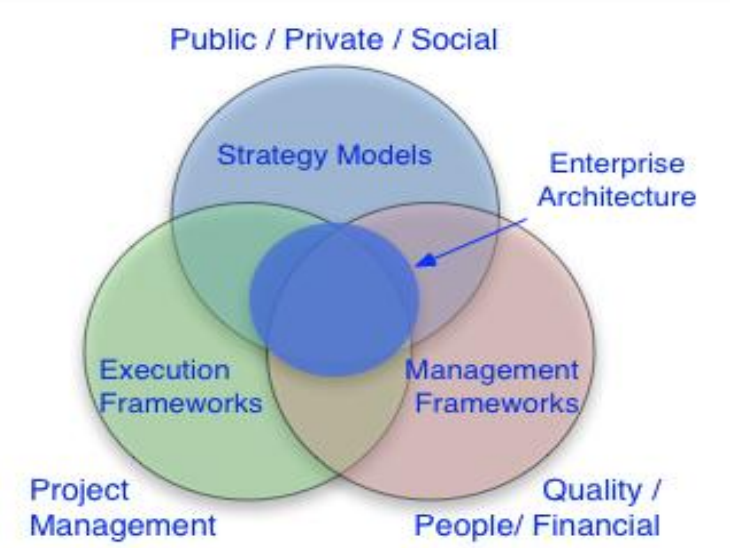


Figure 11: Relationships Across Framework Families

7.2 Intersection with EA Capability

EA provides value in planning, change governance, and purposeful benefits realization. The depth of commitment to different frameworks will define how to adapt the EA Capability and the TOGAF framework.

This is an important concept. All of the outcomes that different frameworks provide regarding planning, change management, and benefits realization are required for a high-functioning EA Capability. Where they are provided, the EA Capability must fit in. Should there be a gap, the EA Capability must fill in. Adjust the roadmap to either fit the EA Capability into an existing capability or extend the EA Capability to fill a gap.

The next exercise is to understand the organizational dynamics to sequence the steps from one or more of these frameworks. As a starting point, The Open Group has published a set of mapping documents and White Papers to map the frameworks, methods, and techniques (see under "TOGAF" at www.opengroup.org/whitepapers).

The scope of describing detailed fitting-in and filling-out options is beyond the scope of this Guide, as any reasonable exercise will vary dramatically across organizations. Further, the level of work explodes exponentially as differences in purpose and enterprise context are considered. This exercise provides an understanding of where the enterprise has gaps to effect best practice for change. The rest of the chapters in this Guide provide an insight into which touch-point from any of these frameworks should be considered for customizing the TOGAF ADM and aligning to an organization's culture.

8 Customization of Architecture Contents and Metamodel

The TOGAF framework identifies two central concepts: a Content Framework and a Content Metamodel. The TOGAF Content Framework describes the types of work products that will be consumed and produced by an EA Capability. A subset of these will be a formal description or architecture description of a system including the components and their inter-relationships. This subset is the Content Metamodel. Both must be customized based upon the purpose of the EA Capability and the enterprise context.

An EA Capability focused on supporting decision-making for strategy will use a different set of work products than an EA Capability chartered to support governance of projects. This is a critical distinction. The Content Framework and Content Metamodel should be adjusted to align with the charter of the EA Capability. Further, the links between an EA Capability and other functions within an enterprise, such as finance, compliance, and operations aspects, require the EA Capability to fit-in and fill-out.

The TOGAF Content Framework identifies two sets of work products. First, work products that are used by others that impact planning, change governance, and purposeful benefits realization. Second, work products that are used within the EA Capability to produce the first set. An EA Capability produces value in direct relation to the consumed work products that improve planning, change governance, and purposeful benefits realization.

Understanding the EA Capability's information requirements requires the following questions to be answered:

- What is the EA Capability's purpose supporting decision-making and governance?
- What is the enterprise Content Metamodel?
- What is the structure of the architecture repository?
- Are there any other considerations pertinent to the enterprise?
- What are the authority, access, and planning divisions for the EA Capability?
- How formal should the documentation and work products of the EA Capability be?

For Leaders working for an enterprise that has a well-established Content Framework, such as defense with DoDAF, this chapter may not add value. Apart from the question of formality, all of the decisions regarding Content Metamodel and Content Framework have been made by DoDAF.

8.1 What is the EA Capability's Purpose Supporting Decision-Making and Governance?

With the understanding of the outcomes expected from the EA Capability, consider the information the EA Capability requires.

As a rule-of-thumb, the more high-level decision-making the EA Capability supports, the less detail and consistency are required in documentation and supporting information. The more it focuses on governance of change project and solution delivery activity, the more detail and consistency are required in supporting information and documentation.

The level of detail required will directly impact the choices on the structure of the architecture repository and how formal the team delivering the EA Capability needs to be. The need for detail and consistency drives formal architecture modeling techniques for traceability and consistent documentation stored in a well-structured repository.

Consider that detail and consistency come at a price regarding tooling, process integration, and skill within the team that delivers the EA Capability.

8.2 Are there Specific Questions to be Addressed?

EA Capability is established for a purpose. That purpose helps define the questions that the EA Capability is expected to answer.

Keep in mind that this Guide deliberately does not refer to an EA team or organization. It is very common that organizationally associated resources answer many of the questions asked of an EA Capability.

Some of the typical questions asked of the team delivering the EA Capability to support decision-making at a portfolio level include:

1. To execute on strategy "A", what are the the size and scope of impact on organizational changes, process, procedures, and technologies?
2. What if the enterprise switched the service provider from "A" to "B"? How soon can change be initiated and completed? Who should be involved? And so on.
3. What should be done in response to one of the technology suppliers changing its product?
4. A vulnerability has been identified in the product sourced from a key supplier. The supplier has provided a mitigation option. What is the exposure from the vulnerability? How soon should the fix be applied? What would be the potential impact during and after the mitigation process has been operationalized?
5. What are the possible root causes of complaints from the customers regarding product "A"?
6. How should the delivery against the portfolio be aligned to optimize operational cost?
7. How can the enterprise maximize differentiation by aligning delivery of the portfolio?
8. How can the enterprise minimize time-to-market by modifying delivery options on the portfolio?
9. How can the efforts on innovation be maximized by adjusting delivery against the portfolio?
10. What is the optimal level and ease of communication amongst technology and material suppliers to maintain the operational stability of the enterprise?

11. Is there any wasteful work done or latency introduced with any process flow related to delivery of products and services to customers?

Each of these questions requires the EA Capability to have different information. The different expectations from the team providing the EA Capability will shape the information that is required and the different work products to be produced. In short, these questions will identify the concerns that the EA Capability must address.

Successful, high-functioning EA Capability teams maintain a viewpoint library that identifies such questions, and the information the team providing the EA Capability must have to answer. The information to which the EA Capability team must have ready access will define the Content Metamodel and repository approach.

One of the steps in establishing a high-functioning EA Capability is defining the viewpoint library. Consider the purpose the EA Capability is being established to serve. This purpose will likely highlight classes of stakeholders and their consistent concerns. This set of consistent stakeholders and concerns will identify the information the EA Capability must have to answer stakeholder concerns. This will drive the design of the Content Framework, Content Metamodel, and the formality of the EA repository.

8.3 What Constitutes the Content Metamodel?

Regarding information management, the purpose defines what information the EA Capability must have at hand. In practical terms, information needs are derived from the viewpoint library and the information that supports the viewpoints. Consider what information is required to answer these two questions:

- How can the enterprise maximize the differentiation by aligning delivery of the portfolio?
- What should be done in response to one of the technology suppliers changing its product?

The Content Metamodel is used to structure architectural information in an orderly way so that it can be processed to meet stakeholder needs. The majority of architecture stakeholders do not actually need to know what the architecture Content Metamodel is and are only concerned with specific issues, such as: "How can the enterprise maximize differentiation by aligning delivery of the portfolio?".

The difficulty comes when, to answer this question, the EA Capability may need to answer:

- Which processes are orchestrated by the differentiating capability?
- Which processes require an application change?
- What functionality does an application support?
- What is the impact of using cloud infrastructure for the application on information security?

There are two approaches to defining the Content Metamodel. The most successful practice ensures that the central questions the EA Capability is established to address concern the focus. In this case, look at the questions the EA Capability is established to answer, and identify the concerns and the viewpoints that address these concerns. *The resulting viewpoint library defines the Content Metamodel.* Anything more is noise and results in unnecessary work in future.

Following this approach leads to smaller information demands and crisply focuses the EA Capability on expected value. Any expansion in the range of critical questions the EA Capability is expected to answer will expand the information requirements. The majority of Enterprise Architects and analysts who have gone ahead to capture more information than what is required have consistently failed.

An alternative practice is to use an established Content Metamodel. This approach enables the EA Capability to address a broader set of questions. However, this approach typically leads to a great deal of superfluous model development and information management. One of the key pitfalls to avoid is assuming that an existing Content Framework is complete and will answer the questions the enterprise is asking of the EA Capability. If you undertake to use an established Content Metamodel, in order to minimize information management, identify the minimum information the EA Capability requires.

In either case, it is important to keep in mind that the information needed is infinite, and resources are finite. Minimize the information the EA Capability must maintain and focus on the purpose for which the EA Capability was formed. Address just those key questions. Take comfort in the fact that development of the Content Metamodel and viewpoint library will feed the evolution of each other.

Every component that is added to the enterprise's Content Metamodel comes with relationships that must be maintained and comes with attributes that must be tracked. The number of interim architecture states and options multiplies the amount of information that must be maintained. To succeed, the Leader should identify and define the absolute minimum information the EA Capability must maintain to deliver the stated purpose.

Recommendation from collective experience of The Open Group is that the Leader should start with the most likely set of questions from sponsors and stakeholders based upon the enterprise context and the purpose of the EA Capability to build the viewpoint library.

Explore the minimum information needed to answer the most pressing and recurrent questions. When the questions appear to be hard to answer, refer to other models used in the enterprise like strategy development, operating model, business capability, process model, project management model, and systems development lifecycle model to validate whether they would provide the answers. Add only those additional reference models that are required to answer the new set of questions. As stated before, keep the scope limited to what is necessary and nothing more.

Consider what minimum information the EA Capability must have at hand, and what information it will need to gather upon demand. The information required at hand is the mandatory minimum. For the other information, ensure that there is a consistent way to gather and relate them to the mandatory minimum. This allows for traceability across more aspects of the enterprise.

The exercise is not to fill out all the information that might be needed in the future, but rather to identify the information that must be available to describe an EA to address the stakeholders' questions. Test the kind of catalogs, matrices, and diagrams required to capture, analyze, and answer the questions asked of the EA Capability.

The TOGAF Content Metamodel provides a good starting point for examining the information the EA Capability requires. It provides a list of common components and common possible relationships the EA Capability may want to keep track of (motivation, role, event, activity, location, resource, platform services) and a set of relationships. Explore the alternative Content

Frameworks listed in Appendix A (Partial List of EA Content Frameworks). They are designed to address different purposes that may better align with the EA Capability's purpose.

To answer these stakeholder questions, the EA Capability will have to employ more than one technique and approach, to collate, classify, and represent back visually, verbally, and with appropriate context. To answer these questions requires an understanding and maintenance of capability, process, and application functionality models and a roadmap with appropriate intersections.

It is rare, but possible, to have a narrow scope for the EA Capability that leads to deployment of a narrow-domain approach like UML and BPMN or a pre-packaged Content Metamodel. Keep in mind that value questions supporting decision-making for strategy and portfolio require understanding cross-domain and multiple dimensions. They preclude use of narrow domain and pre-packaged metamodels.

8.4 Information Managed by the EA Capability

Managing an EA repository is often performed with EA modeling tools. Each item that is being produced should have a lineage to the question that demands a response. The need for a formal modeling technique is directly related to the level of detail required.

The needs of the data collated and the decisions to be taken dictate the needs and approach of the repository and analytic tools. To manage and analyze large volumes of complex sets of data requires automation. It is prudent to have the Content Framework and Content Metamodel suitable for the enterprise and then look for formal tools that support the EA Capability. A high-functioning EA Capability will be asked questions that demand use of automation tools. Use the tools to provide defendable analytics to support decision-making and traceability to support governance.

It is normal that the EA Capability will not manage all of the information required to support the purpose for the EA Capability. Interlinking all the necessary information via information governance channels will reduce the effort required to collect and manage the information. The EA Capability team needs to maintain the catalog and taxonomy only. Using a taxonomy and catalog of items, analysis about the landscape of processes and technology can be performed consistently, providing consistent and rich insights.

Respective disciplines manage detailed data like project financials and technical specification of a robotic arm. To operationalize the ability to mine such varied, in-depth data, it may be necessary to automate the capturing, management, and visualization of insights.

In most cases, assumptions and constraints are time-bound. Depending on the organizational structure, EA may hold the entire repository of data required for analysis or it may just link the structures that enable business operations effectiveness analysis.

The EA Capability should ensure that the notations, vocabulary, and concepts reflected in the work products can be employed to communicate within and outside the enterprise. The demand for alignment to a common vocabulary and framework arises from a need to promptly answer decision-making questions and support governance decision-making.

See Chapter 13 (Mapping the EA Leader's Guide to the TOGAF Framework) to understand how answering questions raised in this Guide results in the population of the TOGAF Content

Metamodel and broader Content Framework. This mapping is provided as an example of how the types of information required, and the iteration of the TOGAF ADM, can be structured.

8.5 Managing the Enterprise Repository

Information management is a critical task for an EA Capability. It is all too easy for an EA Capability to drown in a flood of unintegrated information, usually separated into divergent documents. Effectively managing the EA repository is dependent on effectively limiting the information needed to manage, automate, and apply appropriate standardization.

The priority is to minimize the information collected and maintained. See Section 8.2 (Are there Specific Questions to be Addressed?), and Section 8.3 (What Constitutes the Content Metamodel?). Including nice-to-have information will pose a substantive sustainability burden on the EA Capability team. This burden is particularly troublesome for an EA Capability that is IT-oriented and structured for the purpose of supporting projects. For these, a common pitfall is attempting to include design and operational information as part of the EA repository. If the information is not required to support the purpose, the essential questions, or any mandatory viewpoints, what is the value in collecting it? Design and operational information does not help to answer architecture or governance decision-making questions.

The second priority is determining the level of standardization and automation. Standardization is distinct from automation. Standardization can be performed with appropriate templates and a document repository. Automation requires implementation of an EA modeling tool.

Before any effort is made to capture information, define acceptance criteria for the content regarding completeness, integrity, flexibility, understandability, and ease of sustainment.

Key factors to consider are the purpose, size, and geographic and organizational distribution of the EA Capability team and its stakeholders. The purpose of the EA Capability will drive the required level of repeatability of process, analysis, and representation, which in turn drives the level of standardization of the Content Framework. The geographic and organizational distribution of the EA Capability has the largest impact on the need for automation. A co-located organizationally unified EA Capability can rely far more upon informal collaboration than those who are organizationally and geographically dispersed. The need for automation drives deployment of multi-user model management and analytic tools.

Table 3: EA Repository Standardization Factors (Process *versus* Presentation)

How Repeatability Influences Standardization of the EA Content Framework			
EA to Support …	**Process**	**Analysis**	**Presentation**
Strategy	Low	Low	Low
Portfolio	Medium	Medium	Medium
Project	High	High	Very High
Solution Delivery	Very High	High	Very High

It is common to assume a high-functioning EA Capability requires a high level of repeatability. Purpose heavily impacts repeatability. Architecture to support strategy and portfolio has a strong tendency to be addressing unique questions, using divergent information, and not be tightly tied to predictable execution patterns. This is especially true for EA supporting portfolio. Where there is a low need for repeatability, high levels of standardization are a barrier to value creation.

Conversely, an EA Capability supporting solution delivery engagement requires an extremely high level of standardization. Effective engagement with a solution provider must be predictable to the enterprise and the solution provider. Repeatability will not be possible without a consistently used viewpoint library, information gathering and analysis, and mandated use of reference models and reference architecture.

Table 4: EA Repository Standardization Factors (Team Model *versus* Analysis Needs)

How the EA Tem Organization Model and Analysis Needs Influence EA Repository Standardization			
EA to Support …	**Impact of Geographic Distribution**	**Impact of Federated Organization Model**	**Impact of Level of Complex Analysis**
Strategy	Limited Impact	Very Limited Impact	Very High
Portfolio	Some Impact	Significant Impact	Very High
Project	Significant Impact	Significant Impact	Low
Solution Delivery	Significant Impact	Massive Impact	Limited

There are EA Capability teams serving the entire spectrum – from supporting strategy to engaging with a solution provider (internal and external to the enterprise). Mostly, such teams are federated. These teams may be responding to financial planning questions, alignment with organizational goals, lifecycle tracking (project and operational management), and asset inventory tracking. Two kinds of EA team (Federated EA and Dedicated EA) have a significant need to standardize on taxonomy and data flow and be integrated across all toolsets (financial planning, contract management, project management, and asset tracking).

IT delivery is only part of the solution for the enterprise challenges. IT solutions alter enterprise processes and impact other organizations. Hence, an IT-focused team may require some level of continuity between portfolio planning and solution architecture development. Why an IT solution is being developed or modified and how the change is going to be absorbed by the enterprise are foundations the EA team must know.

In a well-run, creative organization many good ideas are not derived from gaps identified in architecture. In these organizations, a Request for Architecture Work comes from someone with a good idea for improving the organization. We call this the "Request from the Wild". Normally such a request will be proxied by a champion for the stakeholder. The champion may not have visibility into all aspects of the request. Such requests demand a great deal of critical thinking to identify the appropriate spot within the EA Landscape. The EA repository is the most important tool to accelerate the analysis and subsequent conversation with the stakeholder regarding the impact of this request on the EA Landscape and the portfolio.

Evaluate the charter and EA team model before embarking on automation of the EA repository. Consider the tax on team capacity due to lack of automation or limited automation, but do not overemphasize ease of governance. Automation should focus on productivity and collaboration, not control or decision-making.

It is good practice to focus formal modeling to supporting analysis. This drives the use of catalogs and matrices, with a very strong use of component attributes. Normally a graphical model is a barrier to strong analytics and the development of a strong architecture specification. In fact, the current and target states often have the same graphical objects and connections, while the attributes that define the characteristics of the components and relationships are different. Useful visualization routinely requires far more involved techniques than diagrams showing boxes and connections. Evolving the EA Capability and identifying transition states are highly dependent on data analytics work.

Utilizing budding architects and analysts to maintain and manage the EA repository is recommended both from a development standpoint and capacity management standpoint. It is beneficial to employ specialized graphic design resources to support the creation of effective diagram viewpoints in comparison to using out-of-the-box visualizations from EA tools.

9 Organization Model for the EA Team

Keep in mind that this Guide discusses establishing and evolving an EA Capability. This Guide does not suggest that creation of such a team would guarantee a successful outcome from the EA Capability. This Guide does not explicitly discuss an organizational element that could be designated as an EA department.

The required EA Capability must be supported by the correct organization, roles, and responsibilities. Of particular importance is the definition of boundaries between different EA practitioners and creating the organizational model that realizes the governance framework.

Creating an EA Capability team requires the following questions to be answered:

- How will the EA Capability be organized?
- What is the existing enterprise capability and EA Capability, on change planning and execution?
- What are the organizational gaps?
- What are the budget requirements?
- What are the key roles and responsibilities?

This chapter is about considerations to create the team structure for the EA Capability. This should not be confused with Organization Model of the Enterprise (Section 4.2.3), which is all about capturing the existing structure of the enterprise as a whole. At this point, if an EA Capability organization does not exist at the enterprise, reset this thinking – it is now an organization of one – composed of the Leader. When initiated by an executive sponsor, it is a team of two. How to go about building the rest of the team? The rest of this chapter is about factors to consider while creating a new team:

- What skill set should the team providing the EA Capability possess?
- What skill sets can be shared?
- How to approach roles and responsibilities?
- Should sub-teams be created? If yes, how to align all teams?
- What should be the team size and which factors influence alignment?
- How do we measure success and promote the team?
- What is needed to build the team or the value delivered?

9.1 Shared Roles and Alignment

Developing, implementing, and managing an EA practice requires multi-discipline engagement. To define the structure and capacity for the EA Capability, involvement of personnel executing

business strategy development, project, program and portfolio management (both operations and IT), quality management (process and product), governance (financial, legal, others), and IT delivery functions should be defined. Rationale and engagement levels with other disciplines are discussed in Chapter 6 (Architecture Governance) and Chapter 10 (Process Model). It is more than likely that the enterprise already has individual people or teams that perform these functions embedded in other broader functions. To build cross-team alignment, it is necessary to identify the teams or individuals who perform strategy development and program management.

9.2 Alignment

Most likely, the sponsor of the EA Capability has already defined how the team interfaces with the rest of the enterprise. Figure 12 through Figure 14 below show some of the variants of organizational alignment of a team providing the EA Capability in the industry. They are used to convey an idea and do not account for preferences like customer segment, product lines, or country and geography an enterprise may have. It is likely that the enterprise is experimenting with EA and has chartered the Leader to work with external consultants and service providers. This Guide does not take into account where the professionals come from.

Table 5: Examples of Management Systems Integrating/Interoperating with the EA Capability

Examples of Management Systems with which the EA Capability must Integrate and Interoperate	
Business Strategy and Planning	Application Portfolio Management
Solutions Delivery	Finance
Business Intelligence	Technology Planning and Management
Security	Systems Planning, Management, Operations
Business Process Management	…

Its context provides an important part of the requirements and constraints on an EA Capability. In the case of the EA Capability, its interactions will be with the other management systems that support or govern the work of enterprise transformation.

To keep the visualizations simple, teams like project management and quality are not called out explicitly. As they are also shared functions like EA, it is fair to assume they will also follow a model very similar to EA.

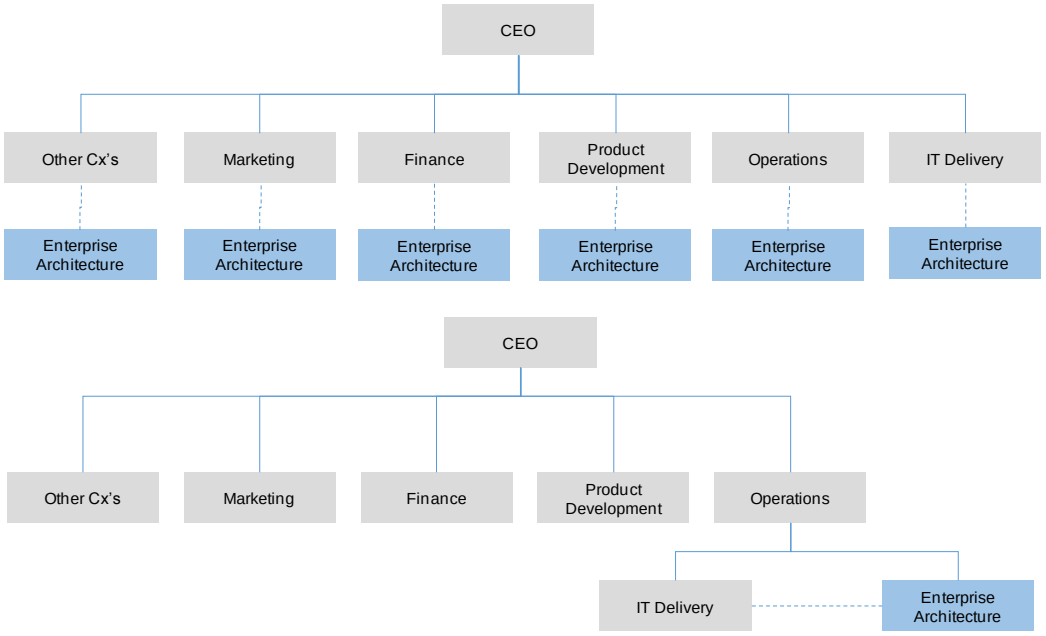
In a strategy-centric model, EA can be aligned with corporate strategy, overall operations, or finance. The team providing the EA Capability extends its services to the rest of the enterprise based on the charter (sustained growth, operational efficiency, cost and risk reduction).

The charter of the EA Capability will determine the coordination and reporting structure the shared teams will have. Business objectives and empowerment provided by the sponsor are sources that will help to identify the alignment model. Variants of the alignment model shown below are not intended to suggest that all activities within an EA Capability should exist within one functional unit.

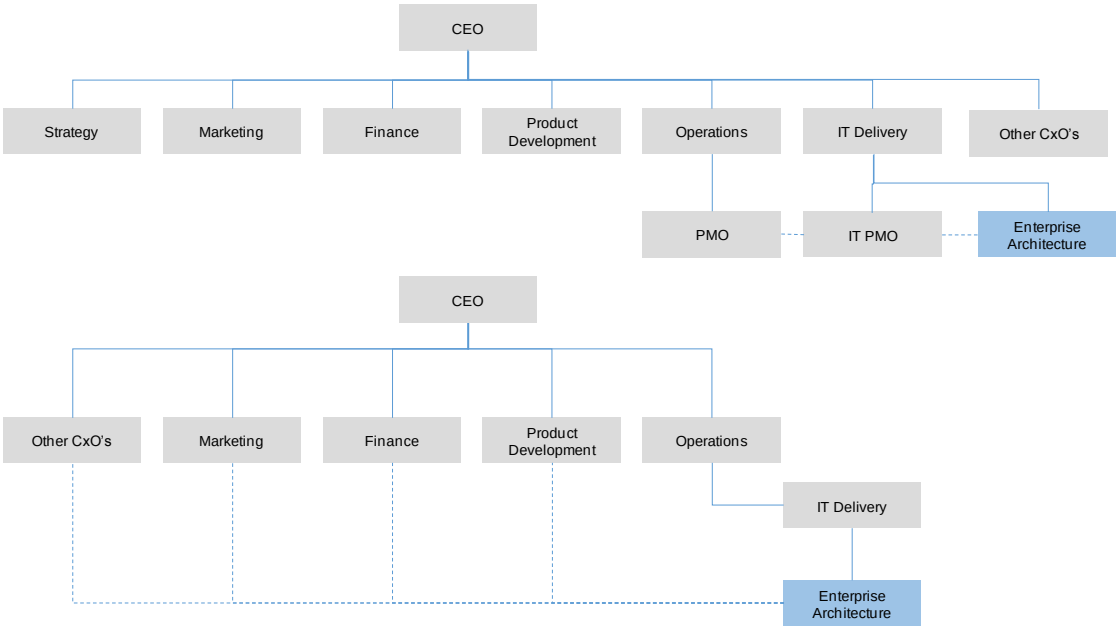
In a function-centric model, it is possible that EA is part of each of the functional verticals and one of the teams consolidates all EA activities. Another variant is EA could be part of the dominant or key function of the enterprise. In this variant, it may be prudent to draw members of the team providing the EA Capability from each of the functional units having extended

responsibility for a common goal, from an HR management perspective, and report to respective functional or regional business leaders.

Function-Centric EA



IT-Centric EA



Strategy-Centric EA

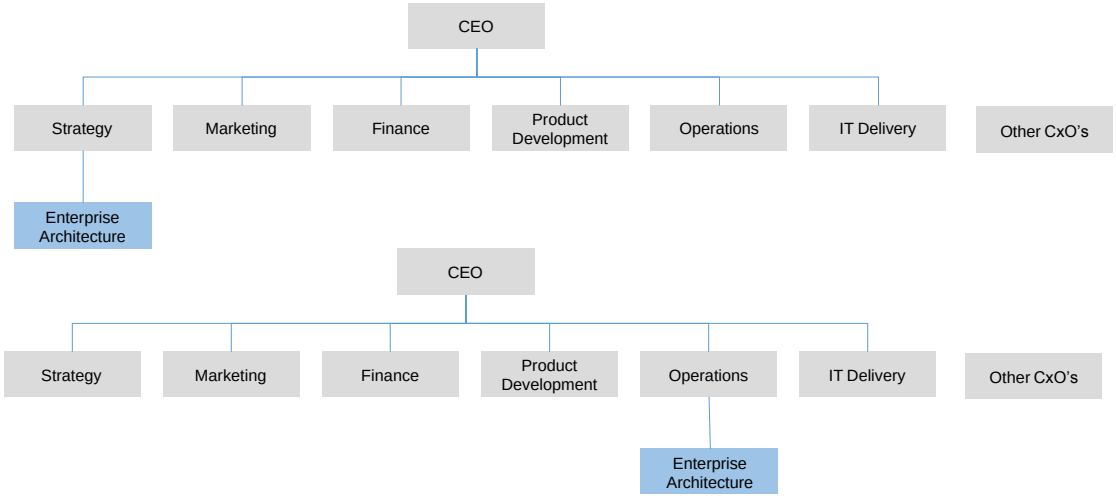


Figure 12: Possibilities for EA Team Alignment

In an IT-centric model, EA is normally aligned to IT organization, irrespective of how it is named. The charter for the team may vary depending upon how IT is structured within the organization. When IT is aligned to the CFO, the charter for the EA team may be driving operational efficiency and cost control. When IT is aligned to delivery or marketing, the charter is more likely to focus on agility and efficiency. Understand the context, and draw members with process analysis and cost management expertise or deep functional knowledge of operations.

When there are multiple EA teams, there is one EA Capability and there should be one Leader. All teams should work under the guidance of this Leader and collaborate. The reporting and funding hierarchies of the teams can be separated from alignment and execution against EA Capability objectives.

9.3 Structure

The structure of the team providing the EA Capability depends on the activities to be performed against the charter. Figure 13 summarizes a high-level view of activities and suggests some of their relationships to each other. Skills required to build and use have different requirements with few overlaps.

The EA Capability must run efficiently, effectively, and in line with changing operational and financial practices. It is conceptually similar to operating any function in the organization. It consists of EA-specific activities and activities that are general to any business.

EA-specific activities are either foundational or purpose-specific. The nature of work done by the team providing the EA Capability invariably places them as a shared function. The team needs continuous input from impacted teams on relevance, efficiency, effectiveness, and growth – it is imperative to have common foundational elements of the EA Capability.

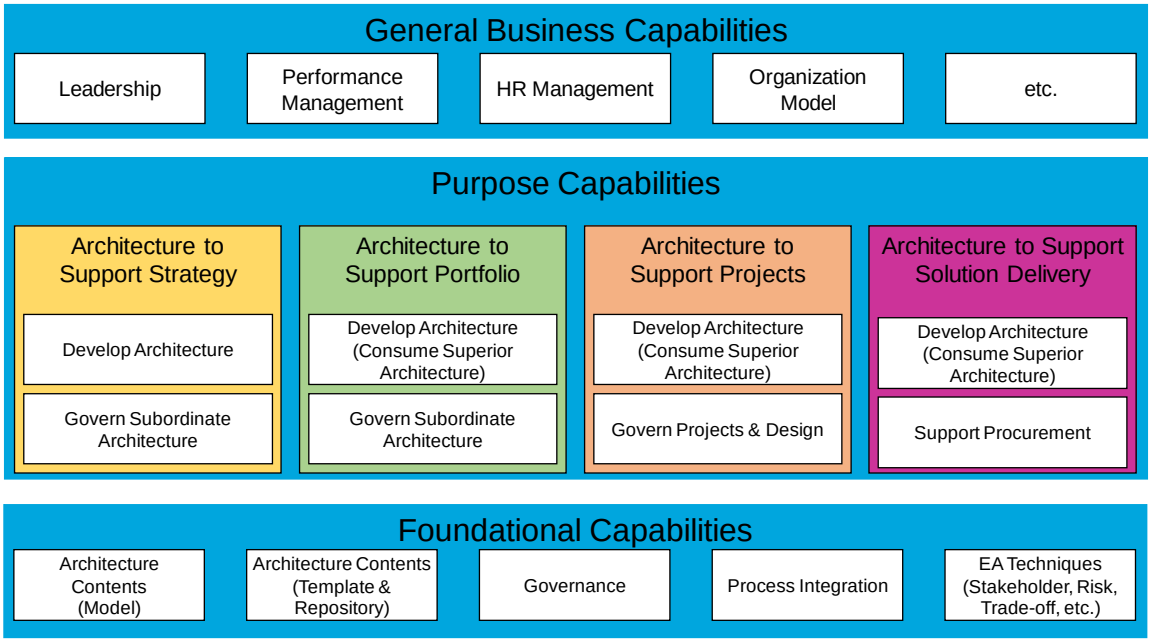


Figure 13: Decomposition of EA Capability Model

An interesting aspect of leading an EA Capability is the need to apply EA services to the EA Capability. This Guide is based upon the premise that a properly architected EA Capability out-performs an *ad hoc* organizational design. In fact, this Guide follows an approach applicable to architecture to support portfolio to define and describe the required EA Capability. The EA Capability will create and revise a unified EA strategy and accompanying EA plans, and will produce an integrated EA roadmap. This activity must grasp the current state and future direction of the business and its supporting systems, and have ongoing interactions with the people who are responsible for achieving the target state across several enterprise functions.

A certain amount of the EA Capability must be in place before architecture work can start; consequently, boot-strapping is necessary. For a budding EA Capability team, there will be an expectation to build a roadmap to develop the capability and to produce usable architecture. The Leader will have to pay attention and track these as separate efforts.

Well-formed EA Capability teams have specialists in each of the main domains like business, information, applications, technology, and security. Depending on organizational alignment, sponsorship, and funding, the team providing the EA Capability may employ specialists per suite of solution areas like enterprise resource planning, customer relationship management, sales force automation, core banking, and treasury. Other cross-disciplines to consider are strategic planners, financial and market analysts, line of business leaders, or subject matter experts, and service or support personnel. It is advisable to keep such functional specialists as part of an extended EA team. The core team is focused on strategies, processes, and advice.

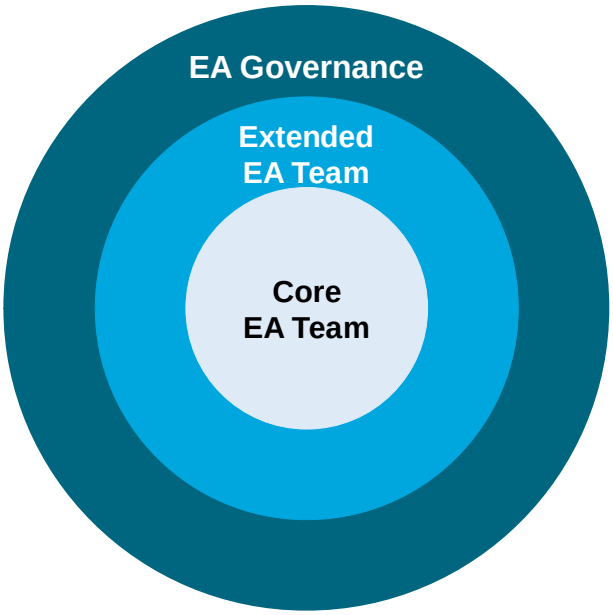


Figure 14: Teams Executing the EA Capability

This Guide now addresses the matter of having an architecture board or a governance council. Chapter 6 (Architecture Governance) discussed the composition of the team and its functions. Regarding the purpose and approach to staffing the architecture board, apply the separation of duties principle. The architecture board is equivalent to the "board of directors" of the EA Capability's business-in-a-business. Members of the governance team should have direct influence over the direction of the business or the outcome of the initiatives architected by the EA. This body sets and manages overall direction for the enterprise. It is not a successful pattern to embed rights for certain classes of architecture decisions in this body. For example, defining the constitution of an architecture building block, solution building block, or a trade-off decision around directory services or assembly line layouts is better decided at the extended EA team level.

The EA Capability, like any other business, must carry out a basic set of general actions. This includes things like finance and budgeting, team development, risk management, and performance management. All of these must be adapted to the specific EA Capability and enterprise. In most enterprises these functions are shared, and EA should benefit from tapping into these teams. Occasionally, to scale the reach of the EA functions, it may be necessary to franchise some of the activities to teams outside the team providing the EA Capability.

9.3.1 Roles and Responsibilities

Every enterprise has a predefined set of roles and responsibilities. If one already exists, use it, test waters, and refine it. While refining, start with defining roles and then think of titles. From a simple people portability and recruitment point of view, it is imperative that you keep the functional titles and roles in common with industry standard titles. It is best practice to separate functional titles from pay grades.

Consider context, charter, culture, clarity of expectations, collaboration, communication and co-ordination, separation of concerns, control, competence, and creative innovation while defining each of the roles and responsibilities.

There is sufficient literature in organization theory and design. Here are some quick pointers (see References):

- Policy Governance Model (ownership, accountability, authority, delegation), in Reinventing your Board: A Step-by-Step Guide to Implementing Policy Governance, by John Carver
- Star Model (strategy, people, structure, processes, and rewards – driving behavior, culture, performance), in Organization Design, by Jay R. Galbraith
- Six Box Model (purpose, structure, rewards, helpful mechanisms, relationships, and leadership), in Organizational Diagnosis: Six Places to Look for Trouble With or Without a Theory, by Marvin R. Weisbord
- Congruence Model (inputs, outputs, informal and formal organizations, people and work), in Managing Organizations, by David A. Nadler, Michael Tushman, and Nina Hatvany
- Multi-Relation Model, in A Causal Model of Organization Performance and Change, by Burke and Litwin

It is likely that the enterprise may not have a team model specifically for EA or for any architecture role. In such a case, consider the catalog of models (organization, process, information flow, infrastructure topography) to be created for the enterprise. If no one has been formally building and maintaining an organization model, the team providing the EA Capability should assume the responsibility until a formal owner is identified. Lack of such ownership is an architectural gap and should be part of the work packages to address.

When forward-looking technology research is not conducted (or it is being conducted, but not operationalized), the team providing the EA Capability should assume ownership until it can be moved to an appropriate owner. These activities may include validating vendor-supplied solutions, component design to be deployed on board an automobile, or be as complex as joint development of a tamper-proof credit card and Point of Sale (POS) solution.

9.3.2 Skills Framework

Governments and private forums within government like the US Department of Labor Occupational Outlook Handbook, the Skills Framework for the Information Age (SFIA), and The Open Group Certified Architect (Open CA) Program Conformance Requirements (see References) have defined detailed expectations for various architect roles. Some of these frameworks also provide a career and certification progression from beginner level architect to industry leading roles. Use these models before inventing one for the enterprise. It will simplify the engagement with the HR team.

9.3.3 Performance Evaluation (of the EA Capability)

The absence of an approach to evaluate architects has been a common hindrance to growth for many in this profession. In most organizations, the existing HR framework is likely to have value measurement and communication approaches. When an evaluation criteria does exist, it is invariably a measure of models, documents, and visualizations produced (local to efficiency of building the EA Capability). These are inadequate to communicate value delivered by the architects.

Some of the major categories to consider for defining value metrics are financial, risk reduction, benefit realization, growth and innovation, proactive readiness, development of organizational capability, and ease of change management. To be specific, consider how the professionals:

- Identify, define, and apply alternatives
- Tailor the basis for estimation of risk, controlling factors and assumptions, and extrapolations
- Eliminate waste; balance agility with innovation, operational stability, and sustainability
- Direct capital expenses planning
- Create a health map and propose corrective actions
- Perform the role of trusted advisor, mentor, or a sales person who expands the scope of the engagement
- Perform consistent enterprise impact assessments

9.4 Capacity

Architect skill growth invariably starts with domain-level specialization and branches into cross-domain expertise. Organizational structure, dynamics, or funding level may force the Leader to create capacity via federated or virtual teams. If the EA Capability is being resurrected, it would be difficult to discern qualified and semi-qualified architects embedded in various parts of the enterprise. Focusing on measures like adherence to objectives, EA process, and value creation approach have proven to surface the right talent to acquire both internally and externally.

Refer to the sample EA Capability models shown in Figure 22 and Figure 23. Develop a model to assess how many architects would be required to cover development of these EA Capabilities or apply parts of these EA Capabilities to achieve the business. Team members will be spending time to keep the architecture repository current or managing changes to the EA Capability and the enterprise. In addition to the skills framework, consider the talent mix to perform these activities while maintaining deep engagement with all stakeholders.

One of the most common mistakes in building capacity relates to the time required to coach and mentor. The architecture discipline is partly about delivery. Driving change in the thought process of leadership and delivery teams that everything is a trade-off, including that sub-optimization exists in the short term, consumes time. Such coaching invariably results in random disruptions inhibiting members of the EA Capability team to meet their schedule. Likewise, it takes time to mentor aspiring candidates. Mentors may be mostly productive, but mentee time should not be accounted as "available". Estimate overhead time before committing to delivery schedule or capacity.

Members of the EA Capability team may possess a level of maturity and capability to deliver against the business objectives and timelines. Experience has shown that organizational maturity is needed to understand and execute on the roadmap, and, if this is not understood, it can result in failure and over committing the team. Like performance criteria, define capacity assessment criteria like time, specialization, and maturity. If there is no measurement, there is no way to identify the need to add more or adjust focus.

As mentioned in the previous chapter, it is advisable to have a set of analysts as resources who can manage and curate the EA repository. It is advisable to employ a graphic designer, on an as-needed basis. While budgeting for the total spend on the EA Capability team, consider such part-time resource needs.

9.4.1 Recruiting to Build Capacity

When the EA Capability is being re-booted or the team providing the EA Capability is federated, it is likely that existing pools of architects would be inherited. It may be baggage or a bonus. There is value to institutional knowledge and rapport – only when balanced against tenure, awareness, and institutional bias. Irrespective of the latitude given to the Leader to build the team, a good approach to recruiting members of the EA Capability team is to follow the knowledge, skill, and talent framework. Also, pay attention to the personal growth path desire of the individual and balance it against the financial accounting model of the team providing the EA Capability. As much as the architect is required to present all facets of a problem or topic, the architect is also required to take a stand and argue on the merits and metrics. Look beyond the daily activities; look for diversity of domains and transferrable skills across business domains and problem patterns.

EA is not all about definitions of trade-off criteria to reduce risk or cost and to improve sustainability over a period. Understanding the organization's objectives, legal environment, financial model, and operating model clarifies that trade-off decisions normally cover more than one dimension. A retractable road barrier is a clear example of innovative design to avoid trading off security concerns against emergency and usability concerns. Enterprise Architects will have to look across the functional and departmental barriers of the enterprise, so that innovative alternatives or trade-off can be taken into account before presenting decision-ready options. It is recommended to have people of varying skills, but who have a common thread in thought process: how to set and follow trade-off analysis to deliver decision-ready recommendations. A deductive reasoning process is not the same as belief and bias-oriented black-and-white thinking. As times change, some of the concerns change as well. What used to be non-functional requirements – like visual appeal and performance – are becoming key functional differentiators (as of 2015-2016). A prerequisite for an individual to be an Enterprise Architect is the ability to keep current and be imaginative.

9.5 Scoping the Depth and Breadth of Business Impact with the EA Capability

The enterprise context, EA context, and purpose of the EA Capability drive the determination of scoping decisions. The EA Capability delivers optimal results when different aspects (like environment, strategy, internal and external interactions, automation, etc.) are handled the way they should be.

This section helps to answer the following questions:

- What are the possible approaches to understanding the enterprise (or the charter for the EA Capability)?
- Which method to partition the scope of work would be best for which industry or enterprise?
- Are there reference architectures and models that could be leveraged?

- What potential trade-off could result due to time dimension impact on scope?
- What if the scope is confined to IT only?

Earlier this Guide discussed enterprise, segment, and capability-based approaches for separation and scoping. These are natural mechanisms, if already available in your enterprise, that could be leveraged.

In order to deliver value, any business should have three scoping statements: customer demography or segment being addressed, products (vertical integration) delivered, and geography being covered. Likewise, EA should also address business capabilities, architectural or business domains, and solution coverage. The Leader will have to create a matrix of these in a grid, either follow a row or a column to arrive at the right size for the team, and to articulate the value being delivered by the EA Capability. Unless the variant chosen is proving to be a deterrent to deliver value, it is prudent to stick to one approach.

9.5.1 Value Chains, Value Streams, and Capabilities

The major approaches are capability, process, and value stream-based segmentation of the business. A capability-based system focuses on what sets the enterprise apart from the competition. In a value-centric system, the focus is on how to deliver the products and services to the customers. It is possible for the enterprise to follow value-based or capability-based models in two different business units or the same business unit in different geographies. For example, customer center operations may be managed as a capability whereas sales may be handled as a process.

In some businesses, terms like front-office, middle-office, and back-office are commonly used to describe the way operations are managed. Front-office means customer-facing operations like branches, counters, or vending machines where customers appear and interact. Back-office implies capabilities like logistics, infrastructure, legal, and finance. Middle-office can indicate nearly everything else. Even though different terms are used to describe value stream and capabilities, use of front, middle, and back office is a common variation.

In the event the enterprise does not have a value chain, value stream map, or capability map, but prefers to anchor on one of them, a good place to start would be the American Productivity and Quality Center (APQC) capability map or value chain or value stream map.

There are businesses like telecom and technology sales where the scope for capability or value stream definition may be constrained by a country; in China, Vietnam, and Thailand local regulations and market behavior are so different that they demand special treatment. Likewise, nuances in the mining industry demand that each mine be scoped differently for operational purposes, but the entire business has to be handled as one unit for strategy purposes.

In the event of managing a Merger and Acquisition (M&A) or divestiture activity, the scope may be just that: land the transition from two entities to one. When performing business as part of an alliance or consortium, scoping should be handled carefully to treat each of the legal entities participating in the alliance and the alliance as a whole in the context of respective legal boundaries.

Some businesses prefer to handle segmentation based on their portfolio of efforts such as growth markets and emerging markets. Such marketing taxonomy indicates geographical boundaries and a set of processes or capabilities to achieve business goals. From the EA Capability

standpoint, care must be taken to clarify the set of processes, capabilities, and geography that is within scope.

Identify the best suited analysis model for the enterprise – value chain, value stream, or capabilities. Validate whether the analysis model can be used to drive change and communicate the architecture. Align and define the EA team model to the appropriate analysis model and architecture delivery model.

9.5.2 Domains and Layers

This Guide discusses domains and layers for awareness and provides clarity on nomenclature. It is sufficient to know that domain knowledge constitutes criteria to staff the team.

Domains and layers are typical words in the dictionary of a technologist. The TOGAF framework suggests that the word "domain" should always be prefixed by a modifying noun to provide context; e.g., architecture domain, business domain, and security domain.

Domain can be defined in a different context as well. Industry-based business domain context for each enterprise is defined and a known context for the enterprise.

For the purpose of this Guide, the (architecture) domains are limited to business, data (and information), application, technology (infrastructure and integration), and security. This view is based on the meaning of the word domain as "a field of thought, action, influence". This definition is very similar to terms defined in the TOGAF framework. See Figure 15 for details on the scope of each of these architectural sub-domains.

A security architecture is a structure of organizational, conceptual, logical, and physical components that interact in a coherent fashion to achieve and maintain a state of managed risk. It is an enabler of secure, safe, resilient, and reliable behavior and upholds privacy at risk areas throughout the whole enterprise.

Security architecture components always have a relationship with other elements in the architecture. Thus, although the security architecture might be viewed as one architecture, it can never be an isolated architecture. That would be meaningless. After all, security is not the problem of security architects; it is a concern for the enterprise.

In the context of security architecture, risk can be operational or business-related. Security architecture contains a balanced view on risk: negative consequences are kept to an acceptable level, and positive opportunities are exploited to their maximum. The business-driven approach is key for the security architecture: business drivers offer the context for risk assessments. They define whether compliance with any control framework is necessary, and they justify the need for security measures.

In Figure 15, the visualization does not convey that one domain is a subset of the other. The idea is that integration and security domains touch business, data, application, and technology domains. Security architecture is a cross-cutting concern, pervasive through the whole EA.

As a cross-cutting concern, the security architecture impacts and informs business, application, data, and technology architectures. The security architecture may often be organized outside of the architecture scope, yet parts of it need to be developed in an integrated fashion with the architecture. See Figure 16 for a view of how the layers interact with each other, and a cross-cutting concern.

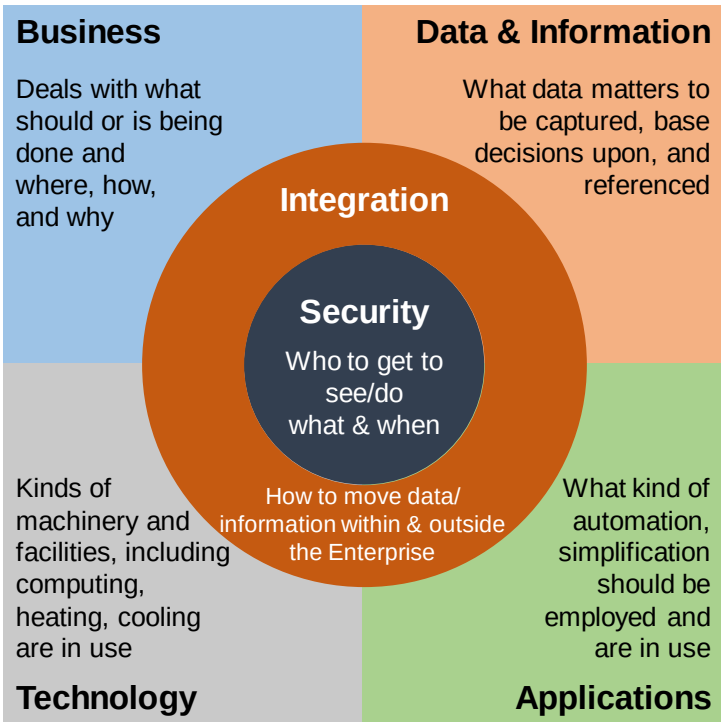


Figure 15: Commonly Accepted Domains

When dealing with function or strategy-specific EA efforts, it is preferable to consider domains first and, as needed, consider introducing the concept of (architecture) layers. When EA is IT-centric, use of layers to define standard guides may be useful for the enterprise. Layers are normally based on man-to-machine or machine-to-machine interactions. Commonly used layers are presentations or user experience (or client tier), service (end-points or front tier), business rule and logic (middle tier), integration and workflow (middle tier), and storage (data tier). As transitions happen to cloud, mobility, and the Internet of Things (IoT), the architectural layers in the IT landscape will change significantly.

The Open Group SOA Reference Architecture (see References) provides a logical solution view, which talks about consumers and providers who are brought together via consumer interfaces, business processes, services, service components, and operational systems. Consumers' loyalty, usability, and consumption are governed and assured by the quality of the service, enabling information exchange between participating members. The OSGi Alliance model, the OSI model based on the ISO/IEC 7498-1:1994 standard, or Functions, Flows (Processes), Layers, and Views (FFLV), are other concepts on technology or architecture layers that can be leveraged.

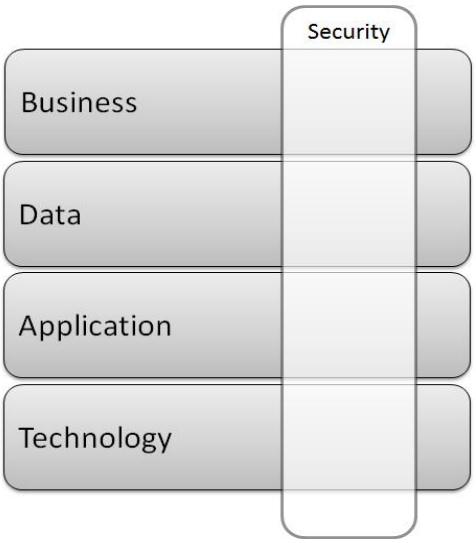


Figure 16: Security as a Cross-Cutting Concern through the Architecture

When communicating domain architectures, terms like conceptual, logical, and physical layers are used. Use of the term "layer" in that context is about level of abstraction in the detail being communicated in models and documentation about the architecture. Conceptual, logical, and physical explicitly indicate the intent of the level of detail that can be found in the architecture.

When defining the scope for architecture work, the terms enterprise, segment, and capability or project are used. Enterprise, segment, and capability classification is used to convey how the architecture project is scoped. Purpose-based classification is aimed at addressing the outcome of the architecture work. For a capability level, all four purposes apply. Always remember the distinction between scoping intent and outcome intent. When directing the EA team and when communicating with stakeholders, be specific and clear about the intent and purpose of the architecture work.

9.5.3 Depth and Breadth

Clarity in business objectives provides hints for what to focus on first: the entire breadth of the enterprise or specific areas. Building on the discussion about scoping the EA effort in Section 4.2.4, consideration to grow the enterprise via M&A or through organic expansion should be included. Objectives like due diligence for M&A would start with understanding all capabilities (breadth) and then go into each unit or capability stack (depth). Objectives like cost and incident reduction would start with a specific capability (depth) and then replicate the process across the business (breadth).

Sometimes, the size of the enterprise or the "span of control" of the sponsor may call for partitioning. The constraint is either capacity of the team providing the EA Capability or value proposition perceived by the sponsors. Either way, the only trade-off that can be made is time to cover the entire enterprise (or delivering value) against the ability to keep the architecture documentation current. When dealing with an enterprise structure where the EA lead is a coordinator across architects from various business units, a need for unification, standardization, or replication of standards, reference models, and reference architecture arises. Partitioning enables scale to cover the breadth. The Leader should drive clarity on principles to employ, approach to classification, and avoidance of duplicate architectural work in the unification or

diversification model. In these scenarios, there is a need to consider carving out a separate integration architecture effort.

The approach to scope the EA work is also called "partitioning" and each scoped slice is called an architecture partition. Architectures that are created to address a subset of issues within an enterprise require a consistent frame of reference so that they can be considered as a group as well as point deliverables. The dimensions that are used to define the scope boundary of a single architecture (e.g., level of detail, architecture domain) are typically the same dimensions used to integrate the subset of architectures.

9.5.4 Impact of Time Dimension on Scope

The capability map or value stream provides a pivot to build the end-to-end view of the enterprise. The level of detail to which they are explored depends on the scope. The strategy and operations of the business change with time. The impact could be in the partition that a team of architects is currently engaged, part of a backlog item, or part of those pending elaboration in the future. It is also possible that concurrent elaboration activities can occur, based on the EA team capacity. Pragmatically, the EA Capability must isolate the impact of changes across concurrent architecture efforts. A side-effect of such isolations or concurrent development is architecture in silos.

Having defined the boundary of the EA Landscape to be fleshed out, the approach to fleshing out the details contained within the EA Landscape should be approached differently. Defining the boundary sets the context for interoperability concerns. Details of the landscape set the context for purpose and outcome. One of the common failure patterns is to scope the architecture project efforts to flesh out the details of the EA Landscape without consideration of the impact to neighboring landscapes. The key principle that should never be compromised or traded-off is that EA is about a system of systems. Cross-system dependency and interaction management should take precedence over the needs of the project or success of the "scoped effort". Care must be taken to define the criteria for optimizing or sub-optimizing a particular area for the overall benefit of the enterprise.

Having executed on this chapter, use this checklist to assess progress made in developing the EA Capability.

- Trade-off criteria is defined and communicated as architecture principles, sub-optimization considerations, and collaboration needs: Y/N
- Team design, skill set, and resource assignment can be completed: Y/N
- Based on capacity of the team, number of iterations required to cover the scope in charter is defined: Y/N
- Performance evaluation of EA Capability team is defined and linked to objectives: Y/N

10 Process Model

It is a prerequisite to create a process model for EA Capability to integrate with the enterprise's operational processes and business cycle. To create a process model, a logical model of the TOGAF Architecture Development Method (ADM) should be transformed to align with appropriate processes of the business cycles with which the EA Capability interacts.

To provide an actionable process model, the following questions must be answered:

- What are the touch-points with existing enterprise processes?
- What are the strategy development processes?
- What are the portfolio and program management processes?
- What are the project initiation and management processes?
- What are the budgeting processes?
- What are the operational management processes?
- What are the change management processes?
- What are the governance processes?
- Are there any ERM processes?
- How is ADM iteration realized in practice (minimum or first time, by layer)?

10.1 What are the Touch-Points with Existing Enterprise Processes?

Enterprise planning and budgeting and the operational and change processes all have connections with the EA Capability. The nature of this connection will depend upon the purpose of the EA Capability identified in Chapter 5 (Business Objectives for the EA Capability).

This Guide uses a simple model for considering process integration – all planning and budgeting processes are considered as decision-making processes. Change and operational processes are considered execution processes. This simple model highlights the basic interaction of the process with the EA Capability. The type of decision-making and execution processes will direct the form of interaction.

In all cases, the critical process alignment is to have the EA Capability work products provided before a decision and before the beginning of change execution activity. Keep in mind the TOGAF framework concept of iteration; for example, the architecture work required to support budget planning, project planning, and solution delivery have different levels of detail. As the enterprise moves through a business cycle more detailed work is required. The correct EA needs to be done at the right time in the business cycle.

10.1.1 Decision-Making Process Integration Model

EA Capability provides advice and illuminates constraints to support the decision-making process of the enterprise. All planning and budgeting processes are considered as decision-making processes. The specific type of decision-making will direct the form of interaction. The interaction is divided into advice and constraints feeding decision-making, and reporting feeding governance of the decision.

Advice provided for decision-making is usually in the form of trade-off analysis, views, and an architecture roadmap. This advice leads to decisions, usually in the form of approval of a candidate architecture. Most constraints are prior decisions, often stated in the form of an architecture requirement specification.

Supporting governance activity, the EA Capability provides reporting within the scope of the target architecture on decisions made by the appropriate process. This reporting is used to confirm execution, drive change to the target architecture, or changes to execution.

Decisions direct the architecture support. Where there are subsidiary decisions the input will be guided and constrained.

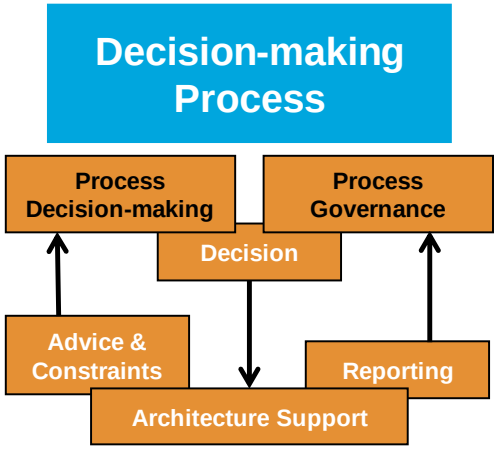


Figure 17: Decision-Making Process Integration

The interaction model described above and represented in Figure 17 remains constant with all decision-making processes. The interaction is dependent upon the type of decision-making process. The World-Class Enterprise Architecture White Paper classifies four decision-making processes with which an EA Capability can connect. The nature of this connection will depend upon the purpose of the EA Capability identified in Chapter 5 (Business Objectives for the EA Capability):

- Strategy development
- Portfolio/program planning
- Project planning
- Solution development

Section 10.1.3 through Section 10.1.9 provide a discussion of how the EA Capability engages with decision-making processes.

10.1.2 Execution Process Integration Model

For execution processes, the EA Capability provides advice, direction, and constraints. All change and operational processes are considered execution processes. The type of execution processes will direct the form of interaction.

Direction to execution processes is provided in the form of what needs to be done – gaps to be filled and work packages. Constraints are defined in the form of an architecture requirements specification. Advice is primarily provided in the form of implementation guidance and non-compliance recommendations. The set of advice, direction, and constraints is used in the execution of change efforts and operations.

Supporting the governance processes, the EA Capability provides reporting within the scope of the target architecture on changes made by the execution process. This reporting is used to confirm execution, identify potential need to change the target architecture, or introduce early changes to execution. Reporting is also provided to the appropriate decision-making processes.

Regardless of the type of execution process and major transformation project, the interaction model described above and represented in Figure 18 remains constant. The interaction is dependent upon the type of execution process, and when the execution is taking place. The World-Class Enterprise Architecture White Paper classifies four execution management processes with which an EA Capability can connect. The nature of this connection will depend upon the purpose of the EA Capability identified in Chapter 5 (Business Objectives for the EA Capability):

- Portfolio/program management
- Project execution
- Operational change
- Operations

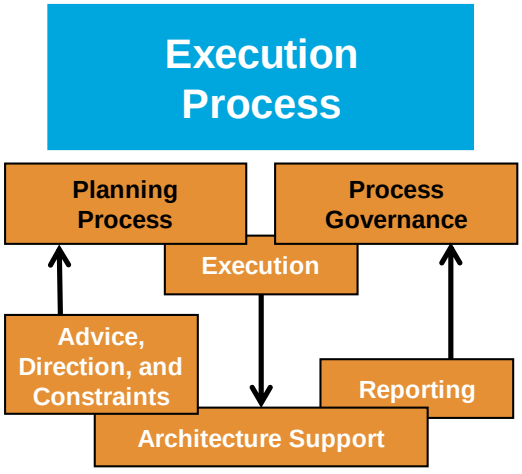


Figure 18: Execution Process Integration

Section 10.1.3 through Section 10.1.9 provide a discussion of how the EA Capability engages with execution processes.

10.1.3 Strategy Development Process

An EA Capability that is chartered to support strategy will be tightly integrated with strategy development processes. Strategic decision-making tends not to closely follow fixed cycles – this requires the EA Capability to be nimble.

Supporting governance will be reporting on execution against the roadmap and value realization embedded within the target architecture supported by the roadmap.

Predictable deliverables will be required before the budget planning process. Supporting strategy development decision-making would provide insight into the impact of the changes to existing initiatives, portfolios, and the extension of roadmaps. When the roadmap is extended, identify and recommend key work packages that deliver value.

10.1.4 Portfolio and Program Management Processes

An EA Capability chartered to support portfolio will be tightly integrated with portfolio/program planning and budget cycles. This requires the EA Capability to be working well ahead of the decision-making cycle to ensure that necessary advice is available during and throughout the budget process.

Governance of the portfolio and program execution is split between ensuring projects deliver on expected work packages and fill necessary gaps and reporting on success that creates the conditions for value realization.

Ad hoc work will be required to support portfolio and program management activity. Central activity is to support the ongoing alignment of approach, jockeying the enterprise roadmap to ensure that all dependency is addressed and synergy maximized.

10.1.5 Project Initiation, Project Management, and Change Management Processes

An EA Capability chartered to support solution delivery and project must be tightly integrated with the enterprise's project initiation process and change process. A common problem for enterprises embarking on EA Capability initiatives is aligning the EA Capability after project initiation – architecting after decision. Performing high-value work after decisions is impossible.

The second challenge is aligning with the change processes at the right level of detail. Many enterprises have change processes that are variable based upon the scope, objective, and sponsorship of the project. Best practice requires the EA Capability to engage ahead of decisions. Where the EA Capability supports strategy, portfolio, and program there is an additional governance activity. This activity is focused on highlighting misalignment of any change activity with the work packages and roadmap.

Two key elements of advice must be provided before initiation. First, the final definition of the project (architecture to support project), or the solution architecture (architecture to support solution deployment). Second, integration and alignment between projects within the context of their portfolio and program. Alignment with project and solution delivery requires a high level of *ad hoc* work to support project initiation and governance activity within a project.

Governance activity should be integrated within the project reporting and control scope. Best practice governance requires EA Capability personnel assigned to the project to remain neutral

and not report to the project. Performing effective governance requires independence from the pressures of project delivery.

Keep in mind that all change activity, whether a capital project or operational change, needs to be governed by the architecture requirements specification.

10.1.6 Budgeting Processes

One of the demands from the EA Capability is to support the budgeting process, either for the fiscal year or for the entire planning horizon. As always, the EA Capability will be operating before decisions, advice, and supporting governance are confirmed. Best practice support requires the EA Capability to deliver the initial version of its advice before the start of any budget conversations.

Integrating with budgeting processes is closely aligned with the integration for portfolio and program management processes.

10.1.7 Operational Management Processes

The primary association with operational processes is information capture during architecture analysis and ongoing governance of operational change.

The EA Capability requires connections with any operational processes that are within the scope of the EA Capability. The primary connection is gathering and identifying value realization metrics; for example, is the specified architecture generating the value expected by the stakeholders? This can be a difficult relationship with an operational team when the architecture is specifying a value that does not align with the parochial preferences of an operational team.

A secondary connection is operational change, and ensuring this change aligns with the architecture requirements specification.

10.1.8 Governance Processes

A high-functioning EA Capability is dependent upon engagement with the enterprise's governance processes. The EA Capability requires engagement at all points in the lifecycle of a target architecture.

Governance is required for both the focus of the EA Capability and the architecture projects undertaken. How the Leader directs and controls the focus of the EA Capability is critical to realizing the available value. A high-functioning EA Capability works on the optimal mix of architecture projects.

Approval of the target is one of the most important governance functions. IT-oriented teams routinely create an architecture board that is positioned with a decision-making role on both the target architecture and conformance of change projects. This pattern is unlikely to succeed, unless the EA Capability is restricted to IT functions, and specifically to infrastructure.

At the core of good architecture is the set of preferences expressed by stakeholders. The target architecture must address the optimal set of stakeholder requirements – this optimal set requires trade-off between stakeholder requirements. When the EA Capability is chartered to support strategy and portfolio, the decision-making body to perform the trade-off will constantly face the breadth and variety of cross-domain stakeholder requirements.

The most successful architecture boards work to control the process. A high-functioning architecture board will be structured to confirm that:

1. The EA Capability is working on the highest value architecture projects.
2. The EA Capability addressed the correct stakeholders for a given architecture project.
3. The EA Capability appropriately works with other implemented enterprise frameworks, such as ERM.
4. The architecture description, supporting model, views, and architecture requirements specification are internally consistent.
5. The implementation and migration plans conform to the roadmap.
6. The architecture contract associates the gap, work package, and appropriate architecture requirements specification to programs and projects.
7. Appropriate stakeholders review conformance reviews.
8. Decisions taken by a stakeholder based upon a non-conformance result in a change to the target architecture or the change initiative's execution approach, or an exception.

One of the most important activities of governance is reporting to appropriate stakeholders. This reporting needs to include:

- Conformance of baseline representation to target and expected value representation

  Make sure that the views, dataset, and controls used for the target architecture and value of the target are used to represent the baseline as well. This might appear counter-intuitive. It is easier to communicate what did not exist or what was eliminated; hence the value of the baseline is less than the target.

- Conformance of implementation and migration plan to roadmap
- Conformance of realization activities (all solution delivery) to target architecture
- Conformance to architecture principles

Consider using summary reporting with a high visual impact. Below is an example of reporting against architecture principles. The same summary can be used for value, roadmap, and execution activity.

Table 6: Example of Summary Governance Reporting

	Principle 1	**Principle 2**	**Principle 3**
Portfolio: Assess the enterprise within the scope of a portfolio.	Conforms	Violates	Not Applicable
Project: Assess the enterprise within the scope of a project.	Violates	Not Applicable	Conforms
Component: Assess the components within the baseline architecture.	Not Applicable	Conforms	Violates

10.1.9 Enterprise Risk Management (ERM) Process

A central role of the EA Capability is to facilitate creation of an environment where operational risk can be optimized for maximum business benefit and minimum business loss. This requires close integration with the enterprise's risk management approach and an understanding of the scope and interests of ERM. Tight integration with ERM facilitates tilting the EA to improve realization of objectives, and the reduction of uncertainty.

In all cases, the EA Capability needs to test the candidate architecture, roadmap, and value against the ERM. While close interaction with a robust ERM process should be undertaken, Table 7 identifies key areas to test.

Table 7: Key Touch-Points with Enterprise Risk Management (ERM)

	Candidate Architecture	**Roadmap**	**Value Realized**
Key Risk Areas	Flags areas of special concern	Flags areas of special concern	Perform more detailed value assessment
Risk Appetite	Aligns with risk appetite	Aligns with risk appetite	Aligns with risk appetite
Business Impact Analysis	Not applicable	Roadmap aligns with & informs impact analysis	Not applicable
Risk Assessment	Performs as appropriate	Performs as appropriate	Value aligns with risk assessment

10.2 How is ADM Iteration Realized in Practice?

An often-misunderstood element of the TOGAF framework is actioning the ADM and the concept of iteration. The TOGAF ADM graphic provides a stylized representation that is often interpreted as a linear waterfall. To demonstrate the flexibility inherent in good practice, diagrams showing levels and fish-ladders up the waterfall have been used. The key point is that the ADM graphic shows essential information flow and is not a representation of activity sequence.

The important thing to realize is every time the EA Capability is undertaking any roadmap development; it is exercising the steps in the TOGAF ADM Phase E (Opportunities and Solutions). It is expected to consume the mandatory inputs and produce the mandatory outputs. This applies to all ADM phases. Simply don't worry about activity sequence; worry about information inputs and outputs.

Consider the stylized Gantt chart in Figure 19. The inter-dependent nature of EA requires all ADM phases that develop a candidate architecture to be executed simultaneously until the candidate architecture is tested for acceptance against the stakeholders' requirements. They close to allow specific elements of supporting domains to be completed. This provides a process-oriented view of ADM iteration.

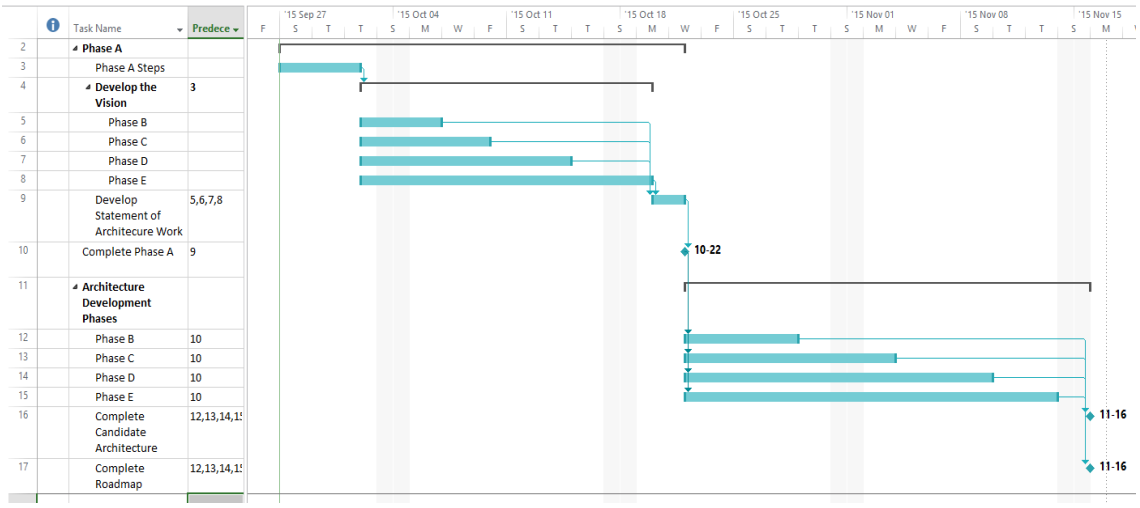


Figure 19: Stylized Architecture Development Gantt Chart

Keep in mind this is a simple stylized example. The real world is always more complex and aligns to the objectives that EA Capability is chartered to deliver.

The process created is not dependent upon the work the EA Capability undertakes to produce, but the timing of completion. The essential question is when an EA Capability must deliver specific work products. Table 8 provides a summary of work products that are actively consumed by key enterprise processes.

Table 8: Work Product Alignment with Key Processes

Practice Supports	Strategy	Portfolio/Program	Project	Solution Delivery
Phase A Work Product: Vision	Key deliverable Before framing of a strategic planning session Refresh before initiation of program budgeting	Key deliverable Before start of budget planning	Often not used Activity to produce a vision overlaps with portfolio/program candidate architecture and roadmap Technique may be used at initiation of business case	Limited use Primary use is early in implementation cycle (via internal providers or execution partners)
Phase E Work Product: Candidate Architecture	During strategic planning session Refresh as required in program budgeting	Key deliverable Before start of budget planning Primary use is stakeholder acceptance of target and definition of gap	Before project initiation and finalization of business case Primary use is creation of architecture requirements specification	Before engagement of execution partners (including internal providers) Primary use is creation of architecture requirements specification

Practice Supports	Strategy	Portfolio/Program	Project	Solution Delivery
Roadmap	During strategic planning session Refresh as required in program budgeting	Before start of budget planning Refresh as required to support budgeting and program management	Limited use Can be used as an input to projects with multiple interactive changes	Before engagement of execution partners (including internal providers) Primary use is identification of required change, and preferences of how to execute change, to manage solution delivery partner selection and engagement
Phase F Work Product: Architecture Contract & Architecture Requirements Specification	Likely not used	Limited use	Key deliverable Before completion of project initiation	Key deliverable Before engagement and contracting
Implementation & Migration Plan	Likely not used	During portfolio budgeting Refresh as required to support budgeting and program management	Key deliverable Before project start	Key deliverable Before engagement and contracting
Phase G Work Product: Conformance Assessment	Likely not used	Likely not used	Key deliverable At key points in project that allow reporting to stakeholders and obtaining decisions for non-conformance	Key deliverable At key points in project that allows reporting to stakeholders and obtaining decisions for non-conformance
Phase H Work Product: Value Assessment	Before governance review, framing a strategic planning session and program budgeting	Key deliverable Before governance review and program budgeting Refresh as required to support program management	Limited use Scope of significant architecture change and value often does not cleanly align to projects	Limited use Scope of significant architecture change and value often does not cleanly align to solution deployment

As mentioned in the World-Class EA Practitioner's White Paper, purpose-based architecture delivery exercises each of the ADM phases to the extent necessary, starts in Phase F, and performs work in Phase B, C, and D. Table 8 informs the Leader which deliverables are important for which purpose-based architecture and from which phase the deliverable is

produced. When designing the process model for the EA Capability, align the steps to develop the architecture to the business cycle and the deliverables required to support decision-making and governance processes.

Once the process model is created, use this checklist to validate completion of the customized EA method and a framework for related functions in the organization:

- Integration with enterprise processes that align to the purpose of the EA Capability is defined: Y/N
- The architecture process links the publication of work products to the overall rhythm of the business (budgeting cycle, planning cycle, change execution cycle): Y/N
- Documentation approach to architecture development, change, and communication is defined: Y/N
- The level of rigor built into the process to evaluate the alternative candidate architectures as well as execution method meets the expectation of the sponsor of the EA Capability: Y/N
- The process accounts for alignment and integration with other processes discussed in this chapter: Y/N
- The process provides governance of any roadmap to achieve selected target state, and the ability to course correct, or assure quality: Y/N

Leaving out any one of these will cause problems at later stages of execution, as the team will be splitting its capacity to address the process gap, build the architecture, and provide confidence to decision-makers.

Part 4: Realizing the EA Capability

11 Create the EA Capability Roadmap

A roadmap provides a set of possible paths and a preferred path to achieve the target state from the current state. The preferred path is arrived at via trade-offs considering the organizational maturity and needs resulting from the gap between current and future state. The process model created using activities in Chapter 10 (Process Model) is a tactical tool, whereas the roadmap is a communication tool. The roadmap should help to answer the following questions:

- What is required before an outcome can be produced?
- What kind of planning and decisions should be driven?
- What resources are required for the EA Capability to deliver?

11.1 Activities to Create a Roadmap

Over time several assumptions could change and result in continual modification of the target state. This chapter will discuss approaches that will assure attaining the objectives, the target state, and keeping changes to the target state to an absolute necessity. To establish this approach:

- Create a multi-year project plan for three distinct efforts – EA Capability management, project engagement for delivery of solutions, and maturity assessment and quality of EA Capability.
- Manage the interaction between purposes of the EA Capability.
- Manage the interaction between the developing EA Capability and the business cycle being supported.
- Manage the interaction with architecture domains (business, data, application, technology, and security).
- Execute on the governance model with tighter alignment with the operating model of the business.

To deliver value, a structured plan is needed – just like a work breakdown structure. An architecture capability implementation should be treated like any other project. The plan will have milestones, deliverables, and measures. The objective is to have a plan to sell value, not metrics, build organizational maturity not just EA Capability, and align with the rhythm of the business.

Establishing and enhancing an EA Capability is a multi-year initiative. The business environment morphs with time. A purpose-driven architecture generated based on an initial gap assessment is validated and updated each year. This periodic update also impacts the EA Capability. Rate and depth of change for the EA Capability may not be as significant as the changes to the enterprise. The roadmap for the EA Capability is also updated from time to time. Allocation of architects to purpose-based projects and development of the EA Capability presents too many moving parts for the Leader. One of the common mistakes an EA Capability

Leader makes is not realizing the need for a project manager to keep them close and true to plans, manage change, and ensure quality and timely delivery.

By definition, the roadmap presents alternative options and the preferred route from current state to target state. When modifications are made year-over-year, it might give an impression of chasing a moving target. The EA team should be able to trace the changes to the roadmap or creation of a new roadmap to the source of change; invariably the business environment and context change. Another mistake made is not retaining the rationale behind selection of a path. When driving change, it is important to keep track of the triggers and the interpretation.

One of the common mistakes to avoid is not creating a dependency matrix of the organization that takes into account governance reporting, as shown in Table 6, and touch-points with ERM, as shown in Table 7, to manage effort and flow of funds to initiate, execute, and achieve target state. Other dependencies are internal to architecture capability – detail of which business process, software and applications architecture, master data (customers, partners, suppliers, inventory, pricing) are available.

11.2 Linking the EA Value Map to the Enterprise Value Map

The value of EA is realized over a period. See the sample value driver document for business (Figure 20) and EA (Figure 21) below. Either a pictorial or verbal description of the value delivered by the EA Capability and the personnel constituting the EA Capability team along a timeline will be useful in creating the plan.

An EA Capability Leader requires a tight engagement with business leaders to understand, anticipate, and provide a path to deliver on their vision. Creating a structure that defines periodic engagement related to strategic concerns and operational concerns goes a long way in managing the workload of the team providing the EA Capability. The structure or engagement plan allows for shifting focus for one or more of the architects and analysts in the team. The EA Capability Leader should track the depth of engagement and depth of detail, completion of architecture artifacts, and value. As neither EA Capability nor value can be delivered in one step, tracking earned value is key to validating alignment to the roadmap. Forrester Research on EA value summarizes this best:

"*Your progress tracker should be able to quantify what is needed (gaps), prescribe where we should be by what timeline, why this prescription is better and how it can be put to practice, and finally how to collaborate with other architects to translate these 'prescriptions' into reality. Complement these with an innovation and 'get ahead' plan.*"

It is the communication plan that demonstrates all the detailed work undertaken by the architects. EA value realization communication should follow both the project release and planning horizon cadence. For example, if the enterprise has a quarterly project release schedule and follows a January to December fiscal funding plan, then the EA value (cost elimination, revenue increase, or value realized) communications should be sent in between the release dates of the two consecutive project schedules. Likewise, communications for future activities should be sent well before the beginning of the annual planning cycle.

Communicating EA Capability maturity may sound like an academic communication. However, a metric to show the value improvement over the previous communication period would suddenly make the maturity communication more attractive and meaningful. Complement the

cadence of business leader engagement by communicating how the maturity of the capability improved the efficiency of the organizational initiatives.

Members of the team providing EA Capability have two different day jobs – one to produce the artifacts and another to engage actively with technology and business leaders. The roadmap should consider the capacity of the team; articulate milestone dates to deliver on the objectives, and define appropriate checks and balances for the EA Capability and the projects it influences.

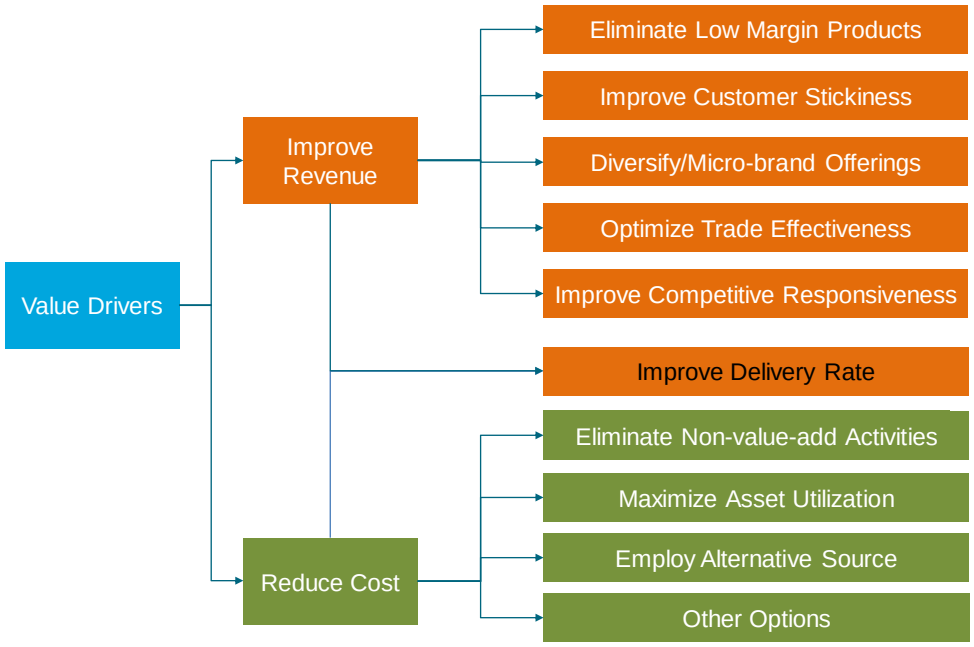


Figure 20: Sample Business Objective Diagram

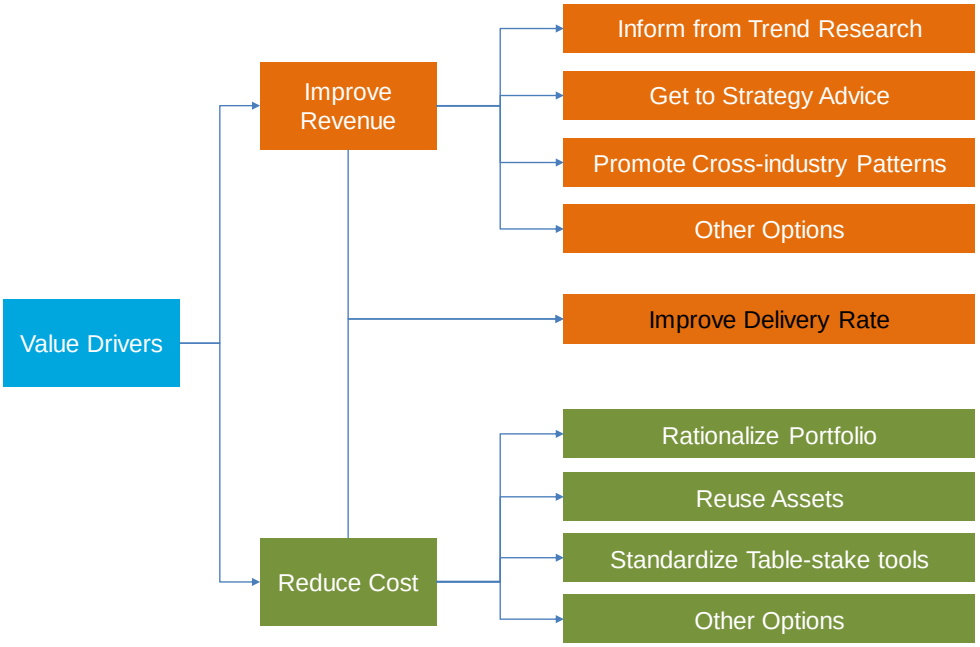


Figure 21: Modified Version of Business Value Diagram to Represent EA Value

A strategic enterprise roadmap links go-to market strategy milestones to business capability maturity milestones along with its related technology development and learning of personnel involved in the realization of the strategy. It is ideal if the team providing the EA Capability helped create this roadmap and supports all the data behind it. In situations where go-to market and business capability maturity milestones are predefined, having access to this view will inform the EA Capability team to create its roadmap for technology research and delivery.

Other dimensions to address on the roadmap are as follows:

- When each version of gap analysis findings and recommendations will be published
- When each version of the decision framework along with decision-ready recommendations will be published – it is preferable to align this with the planning horizon and project initiation or ideation cycles
- EA Capability improvement (recruitment, training)
- A plan to gain visibility into developments within and outside the enterprise impacting the EA Landscape
- A plan to acquire the right tools to use for EA
- A plan to use modern tools to be collaborative and communicative

11.3 EA Capability Model

The ratio of projects or resources employed in the enterprise is normally several magnitudes higher than the capacity of the team providing the EA Capability. To replicate key efforts of the team providing the EA Capability, a capability model provides the template with which the EA function can be scaled to cover the entire enterprise.

While there are some publicly available EA Capability models, such as NASCIO or the World-Class Enterprise Architecture White Paper, none of them can be directly applied to an enterprise. Context under which they were developed never really matches an enterprise, but they provide a great foundation. Experience shows that using existing capability models in the enterprise or publicly available models as a reference or base accelerates assessment, delivery, and adoption. Analyze these models in terms of the EA Capability context and purpose before selecting the base. Starting with a single model and adding or modifying to meet specific needs of the enterprise vastly reduces time to finalize.

When the capability models presented in the World-Class Enterprise Architecture White Paper or the one shown in this Guide are not adequate, start with the TOGAF ADM phases as the base: manage business architecture, manage data architecture, identify architectural opportunities, and identify alternate viable options.

EA is not a standalone capability. EA is supported by functions like HR, marketing, and product research. The capability model should specify such supporting functions and the extent to which they are leveraged. In the earlier chapters of this Guide, a need for engagement modes with all stakeholders of the EA Capability was addressed. Specific attention was paid to initiating projects and the factors that influenced creation of projects. To complete addressing all aspects for managing EA as a capability, the Leader should:

- Define and measure the team's ability to respond to changes in business environment, based on what has been learnt from collective experiences of the team.
- Define practices for planning, developing, collaborating, governing, and managing architecture knowledge for the enterprise.
- Identity, specify, and rollout an approach to training, infrastructure (tools and equipment), and support needs for the team providing the EA Capability.
- Establish an environment to handle errors, reflect on efforts to improve continuously, and an ability to use data insights for decision-making.
- While addressing the above dimensions, care must be taken to balance processes becoming shackles that anchor EA efforts to the need for agility and culture to respond to business stimuli. The measurement of success should be about assuring quality of work (providing decision-ready recommendations) with cost-optimized processes.

Here are some of the sample models that could help:

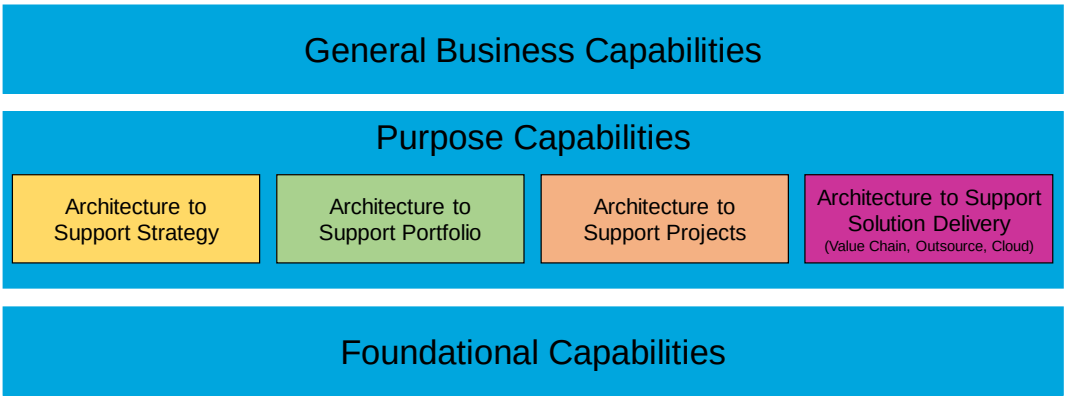


Figure 22: Sample EA Capability Model – I[18]

This model aligns to purpose. The purpose could be focused on operating EA or delivering value from EA *viz.*, operational capabilities, and separates common Foundational Capabilities or General Business Capabilities. The capabilities required to support each of the purposes are not presented in this Guide.

[18] Derived from the World-Class Enterprise Architecture White Paper.

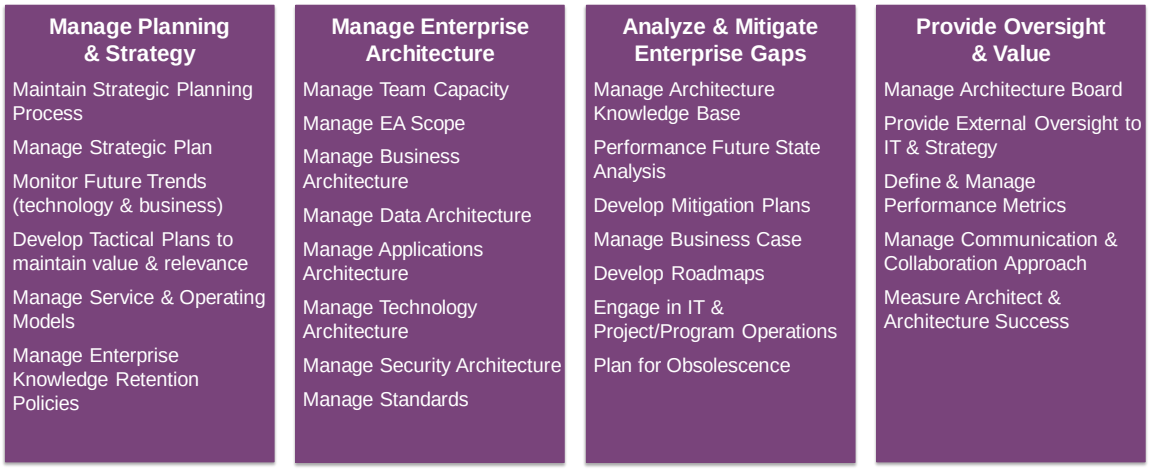


Figure 23: Sample EA Capability Model – II

The model shown in Figure 23 aligns to classic architecture domains and development of architecture to support strategy. When applied to an enterprise that manufactures packaging material for food products, "monitor future trends" would mean how to improve the shelf life of products using techniques developed for defense use. Inputs from such monitoring could call for changes to business and technology architecture – retooling the plants, scouting for new raw material suppliers, and new processes. Obsolescence of a product can arise from regulatory changes – like a ban on use of plastic bags or CFC-based coolants in air conditioners and refrigerators. In this connected world of distributed sourcing and just-in-time manufacturing, a focus on IT infrastructure is required to track any impacts arising from disruptions in the supply chain.

While a capability model makes it easy to establish an approach to measure the efficiency and outcome of the EA efforts, alternative approaches like process control or Balanced Scorecard are equally effective.

12 Establishing and Evolving the EA Capability

By defining the process to implement the EA Capability framework, governance framework, and a roadmap to implement and manage EA initiatives, there should be a blueprint to assure the outcome expected from the team providing the EA Capability. By defining the organization model for the EA Capability team and building the structure to capture and manage architectural contents, the team's ability to execute on the specified course of action (roadmap) is assured as well. Each of the chapters until now presented discrete topics of concern. This chapter is focused on providing the linkages across these topics to enable a "Sustainable EA" practice. It is better to use proven methods like a capability or value chain model to stitch the pieces together and formulate a management approach.

An EA Capability team is a collection of people (architects, analysts) who employ a set of common processes to manage the set of information about the organization to enable achievement of the enterprise's stated purpose. The EA Capability is the ability to develop, use, and sustain EA.

The enterprise's leadership are the EA Capability's customers. The Leader should articulate purpose, ethos, and delivery to its customers. Focus on the outcome the EA Capability will deliver; foundations for future scale and function clarity; and the flexibility to adapt and change with the enterprise's environment. Follow the same concepts of identifying the gaps, defining the constraints and controls, and incorporate the flexibility needed to periodically adapt the EA Capability when developing a roadmap.

This chapter deals with the concept of capability in the context of a management model that allows for innovative applications and redeployment across the enterprise.

12.1 Recap of Concepts

Up to this point in the Guide, generic leadership and management concepts relative to the EA Capability, including the incarnations it could have had in the past, were presented. Some of the key takeaways from that discussion are:

- Purpose of the EA Capability
- Development of, using, and managing architecture
- The relationship of EA with other disciplines within the enterprise
- It is necessary to refer to this Guide and the TOGAF ADM more than once to deliver value

Afterwards, the Guide discussed the importance of the organizational context and the need for an EA practice. During this conversation, differences between the organizational outcomes and team structure were discussed. While discussing process model, the Guide presented different organizational cycles and budgeting ceremonies. Likewise, governance, risk, reporting, and financial model presented views for implementation controls. We also discussed that the team providing the EA Capability should assess why the architecture work has been initiated,

readiness, and maturity in absorbing architectural information. This understanding drives the definition of the content model, viewpoints and views, and use of a repository.

Having gained knowledge about the organization and its intent to engage in economic activity (values and business motivations), the Guide discussed the objectives and need for setting up an EA Capability. One of the key principles to focus on is the value delivered to and iterated by the TOGAF ADM to the extent required to deliver value. It is imperative to scope the depth and breadth of the EA work commensurate with time and objectives. Later in this chapter, there is a discussion called Sustaining and Maturing (in Section 12.5) relating to leveraging the span of control the EA Leader currently has, expanding it, and thereby iterating the ADM cycle to keep adding value.

It may be a reality that there are people in the enterprise who perform architecture development without carrying appropriate titles or following a particular career path. Similar to following the money trail to create a forensic map of cash flow and value addition, following the artifacts will lead to where the architecture work gets done and who performs it. Creating a map of the diverse role titles to appropriate architecture domain roles will create a view of the architecture community. This is the community or extended team that the EA Leader should nurture and utilize to deliver EA Capability. To deliver on the charter, it is required to build the capability and capacity of the EA team, commensurate with the demand.

Then the Guide discussed selection, customization, and use of EA and related delivery assurance frameworks. It is important to identify and define the interaction points between product and service delivery strategy to the TOGAF ADM (or the customized architecture method). This can also be evolved as the breadth and depth of the mandate for EA work evolves. The following chapter discussed the need to have a governance model that balances how the team providing the EA Capability goes about development of architecture artifacts and how it engages with rest of the enterprise.

Finally, for the data that EA manages, the significance and need of structure, the Content Framework and Content Metamodel, and an automation tool were discussed.

12.2 Start with Purpose

In a world of multi-point competition, ease of availability of substitutes, and continuous pressure of quarterly fiscal results, organizations are forced to create waves of revenue models via new products and services, contractual commitments, or expansion of customer base.

Based on the alignment of the EA Capability team, the purpose for EA could be cost control, risk optimization, strategy development, or variants of these factors. Even if the charter evolves, expectation to deliver on the primary intent and focus generally does not go away. This assessment and grounding is based on the purpose for which the enterprise is engaged in the economic activity as well as why the team providing the EA Capability is formed.

Just like how the enterprise approaches identifying new models to generate revenue, suppliers of products and services to the enterprise also come up with different methods, models, or versions of their products to force changes to the ecosystem. Based on the assessment of the enterprise, the EA team will have to identify and project out when the enterprise will have to start engagement with these emergent technologies and concepts. The EA Capability team acts as subject matter experts in providing a review of the emergent concepts, technologies, and patterns

to the stakeholders and decisions-makers. Such review documents should align with the purpose for which the EA Capability effort was created.

One of the key advantages an Enterprise Architect has is the ability to look at the system under discussion without any bias to the views of the executives and implementers, customers or support personnel, and security or compliance officers or developers, technology or time. When an Enterprise Architect presents a balanced view, supported with rationale addressing future needs, trade-off conditions applied, accounting for culture of the company, teams generally gravitate towards common goals setting aside emotional favorites. Stakeholders invariably want this insight from the Enterprise Architects to validate that they are on the right path or to fail fast and course correct with the least sunk cost. The expectation is also that the Enterprise Architect provides an honest impact assessment and risk mitigation alternatives. Experience has shown that raising what could normally be perceived as the most uncomfortable set of questions instigates a chain of positive changes in the enterprise.

The EA team should create a periodic assessment of readiness the enterprise has for adopting EA practices or new technologies – the next leap of value delivery. This assessment helps the team providing the EA Capability to time the case for expansion of the charter. Ambitions for growth in charter as well as maturity aside, the goal is to ensure that the team providing the EA Capability stays relevant and current with the ecosystem and business needs.

12.3 Trusted Advisor and Instigator of Change

Most organizations today are not starting blue ocean strategies;[19] several of their initiatives are the n+1th attempt to solve a business problem. In such scenarios, when solution alternative evaluation or solution development efforts begin, modern lean methodologies do not lend themselves to view the broader context of the enterprise. An Enterprise Architect understands inter-dependencies within and outside the enterprise and can guide the teams to create appropriate points of isolation. An EA team should communicate clearly and continuously the shared vision for the enterprise and how all stakeholder groups are coming together behind that vision. Moving the focus of the vision from the typical inside-out view to an outside-in view elevates the thinking of key decision-makers. Instilling the thinking for points of isolation to manage change and to manage rapid response to market dynamics brings trust in the people and, hence, to the team providing the EA Capability.

EA Capability teams that focus and deliver key organizational transformations are statistically more successful than teams that focus on standards, reference architectures, processes, and governance structures. Such a demand at times has caused scale issues for the team providing the EA Capability. To scale, successful EA teams have employed techniques like franchising typical work such as impact assessment questions and trade-off considerations. To employ such techniques, the process should be well defined.

When engagement opportunities to land organizational changes or to franchise are not directly available, the development and publication of point of view documents has proven to be a successful technique to influence change. Monitoring and assessing which points of view get read and by whom presents the stakeholder interest. Tracking the changes those stakeholders

[19] For more on blue ocean strategy, see Blue Ocean Strategy: How to Create Uncontested Marketspace and Make the Competition Irrelevant, by Kim and Mauborgne (see References). Do not confuse this with green field work. Some efforts may be green field within an enterprise, but the pattern may have been solved elsewhere. There is value in such cross-pollination, and the EA team will play the role of a trusted advisor.

initiate results in peer-level acceptance. Communicate and share the credits of initiatives to establish the team as agents of change.

12.4 Change Management

As business dynamics change, organizations undergo change – informed by the team providing the EA Capability or otherwise. It is necessary for the EA Capability team to track changes in the external ecosystem and create point of view documents. To sustain and grow the EA Capability, the Leader should prepare a list of recommendations for the decision-makers about transformation(s) needed to keep the enterprise abreast or ahead of ecosystem changes. Some transformations may require a change in operating model and some just an alteration in product mix. The range of coverage in point of view documents may include changes in operating model, technology adoption, risk reduction, or the nature of services offered or trade-off criteria to mitigate. Depending on the charter, the EA Leader should indicate to the decision-maker when a hype would become a necessity or cost of adoption and risk of failure is balanced appropriately.

The trend since the new millennium is increased complexity of products and services that uniquely differentiate from potential current and future competitors. Some of these products and services reduce dependency on certain skill sets and some require new and specialized skills. Also, several products and services are being developed using deep collaboration with niche partners. The cost of collaboration has been falling, and diversity of service providers has been growing. Organizations have been shrinking the core and expanding at the edges. In such an era, success factors and competence drives the strategy based on how well the sets of activities performed by the enterprise dovetail with one another. When EA creates an enterprise map – that has the depth of capabilities, processes, technologies, training, investment flows – operational fit across teams and themes of strategy realization come to light. Once again, just like the advice provided to business, periodic development of the case for change of the EA Capability informs the team to update its skills and to stay ahead of rest of the enterprise.

In general, enterprise plans do not question the assumptions made for an effort nor do they justify clearly why something has to be done and when. Most of the business cases are based on the affordability of the enterprise to spend its resources. EA roadmaps present the reason for something to be done and present the alternatives – each with implications – tracing assumptions to predictive outcomes. In this approach, ease of change, validating change as time passes, and an assessment of "what the end looks like" can be painted clearly to guide organizational, product, or process change.

12.5 Sustaining and Maturing

To sustain and mature the EA Capability, the Leader should assess the capacity to execute and validate the possibility of change in charter or scope with the sponsors:

- A function-centric EA – focus would be on appropriate business and process architecture, technology sourcing, and cost of operations.
- A strategy-centric EA Capability – enablement of sustainable strategic advantage, leveraging technology as a business accelerator, balancing inside-out and outside-in perspectives. Irrespective of the nature of alignment, there is a need to have the members

of a team with varied styles of thinking and execution (star gazers, anthropologists, and planners).

- An IT-centric team – the challenges are going to be pivoted on CIO priorities: reducing cost of operations and agility to meet the business needs, keeping the ecosystem current with technological updates, and so on.

The styles of these people complement the enterprise capabilities at strategic (executive engagement), value addition (managing composition of the enterprise), and coordination (common services) levels. As one of the former CEOs of Shell Oil puts it: "*people are the difference*". EA – as much as it is about business strategy and technology – is people-centric. To grow the capability, the Leader's motivations should be grounded on people engagement. It is the responsibility of the Leader to nurture these three styles and find a balance for the people possessing them to be executing on a common set of principles and beliefs, namely: connectedness, inclusivity, and relevance.

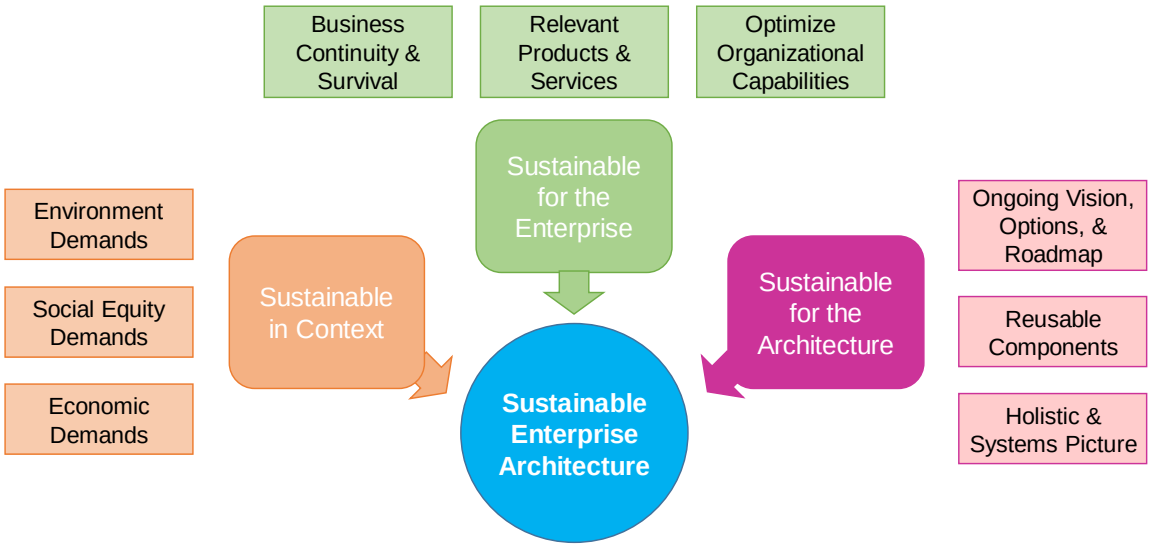


Figure 24: Sustainable EA

12.5.1 How to Engage and Promote Value Execution of the Internal Stakeholders

A team providing the EA Capability with adequate sponsorship has no cost or overhead to acquire new engagements. The challenge is that the buyer base of EA Capability is predefined – unless the enterprise decides to broaden its footprint. In this case, the focus should be about retention and repeat business from the same set of customers. Several techniques can be employed from the public relations and project management playbook to achieve this. Measure quantitatively and qualitatively to communicate every small improvement and value addition the EA Capability team has delivered in terms that are close to the primary and secondary consumer of the EA services. To sustain EA Capability, you need to focus on why, when, and how EA activities are performed and how the output produced by the team providing the EA Capability is being consumed and by whom.

When the sponsorship is challenging, the focus should be on soft-selling, like communicating the need to subscribe to a retirement or insurance plan. One of the successful methods employed when sponsorship has been insufficient is to develop a roadmap and an implementation plan with reasonable financial projections and present them to executives when annual budget

preparations are being initiated. Take time to understand or infer the strategy and direction of the enterprise from annual results, analyst calls, and objective statements of top 20 projects. Use this understanding to build a roadmap for at least one key business unit: if the focus is on improving sales, do it for marketing and sales; if the focus is operational cost management, create one for the operations team. There is heavy cost on acquiring sponsors. In a re-boot scenario, the cost is multi-fold higher.

In EA, there is no right, wrong, or singularity of approach. EA forces itself and its consumers to almost always think of trade-offs; it forces them to look at data to help navigate the chaos. What it achieves is removing the bias for repeatable process and cost optimization. It brings focus to consider all viable alternatives. The change in thinking of organizational leadership is an example of qualitative value addition. All architects in the team should think of developing a set of trade-off criteria that is current with strategic and operational challenges. Providing decision-ready alternatives creates better sponsorship and acceptance of an EA team.

Depending on the organizational culture, the EA team should question a few sponsorship assumptions, if the charter is not clear, and ask itself:

- What kind of financial control should the team providing the EA Capability have? There are differences in views – from managing just EA's operational cost (or considering the team providing the EA Capability as capital expense) to sponsoring technology research effort, all the way to validating every initiative for relevance and alignment to organizational goals.
- Should governance be used as a feedback mechanism for both architecture output and project conformance?
- Even though it is suggested earlier in this Guide to use the TOGAF ADM to the extent that immediate value can be realized and iterated, is it the right approach, given the culture of the enterprise?
- Given internal and external forces, should the EA operating model be target architecture or target operating model-driven?
- Should the planning be based on capabilities or process efficiencies and differentiation offered to customers?
- Depending on the charging model in the enterprise, what is the extent to which each of the project execution teams can be taxed for EA engagement?

One of the necessary periodic exercises is to move the focus of the enterprise and the team providing the EA Capability from rigor of documentation and static analysis to operational and strategic business outcomes. Experience shows that such a shift invariably results in increased sponsorship and demand for EA resources.

12.6 Building Community and Mentoring

There are a few things in the enterprise that are everybody's business – customer goals, quality goals, and EA. Every manager or product developer's decision has an impact on the goals of the enterprise. Procuring services or products from a supplier introduces friction between objectives and the operating model of the enterprise and that of the service provider. In addition to the risk of engaging in an economic activity, the enterprise is now compounding its risk factors. Given

the premise that EA reduces risk impact, objectives of service providers should be assessed periodically.

As the TOGAF ADM cycle is explored in iterations to achieve maturity, develop a playbook to replicate the success with new sets of players, not directly under the team providing the EA Capability's control. Success and sustainability of the team providing the EA Capability is determined by the belief of the next generation of personnel in the EA Capability team - the mentees of the team and that of the sponsor. Spreading the knowledge and practice of EA to new parts of the enterprise has never hurt the team providing the EA Capability.

Mentoring is one of the techniques to employ to achieve maturity and replication of EA efforts in other parts of the enterprise. Being a trusted advisor is a form of mentoring. Care must be taken to differentiate grooming budding architects and coaching organizational leaders. It is likely that architecture work happens in different parts of the enterprise, with people who don't have an architect title or are external to the enterprise. Develop deep and continuous engagement with such enthusiasts. Identify what aspects of the architecture work would become differentiators and intellectual property of the enterprise. Promote the differentiators and those who are developing and curating those assets.

Identify the annual training cycles or online courses that the enterprise employs to build talent. Build targeted 20 to 30-minute talks on specific topics to create a pipeline of learning. Depending on the size of the enterprise, augment such training topics with periodic architecture summits. Another approach is consideration for individuals going through technical specialty or architect certifications. Pay attention to what certifications are being pursued – architecture processes or architecture development. Differentiate expertise in architecture method and practice from thought leadership with architecture.

12.7 Tools and Techniques

In simple terms, create a standard operating procedure and execution process for the EA Capability. Tools without interoperability or seamless integration leave room for manual efforts and out-of-sync versions. Out-of-sync versions result in effort cleansing the information instead of effort delivering insights and intelligence. As a Leader, spend time and effort to get the right repository to hold the EA data with considerations for interoperability and reducing rework for downstream work.

Care must be taken to differentiate a project document repository and an EA repository. EA artifacts and project artifacts feed each other. Any tool or process that requires part of the work to be recreated in different tools will lead to failure of adoption.

Categories of documents and repositories to consider are:

- Diagram and visualizing tools for architecture
- Diagram and visualizing tools for solution and technology design
- Standards catalogs (industry, business domain, enterprise) and look-up tools to understand the details of the standard
- Readiness and maturity assessments and progression management tools
- Roadmap management tools, potentially with time series analysis capabilities

- Financial and investment analysis tools
- Architecture evolution management tools

Part 5: Mapping to the TOGAF Framework

13 Mapping the EA Leader's Guide to the TOGAF Framework

The EA Leader's approach described in this Guide can be mapped to two central elements in the TOGAF framework: the Architecture Development Method (ADM) and the TOGAF Content Framework.

The activity described in this Guide follows the ADM's Preliminary Phase; the Preliminary Phase is a customized path through the TOGAF ADM. This journey highlights a practical example of the TOGAF concept of iteration, answering the correct question at the right level of detail to inform the next question and decision.

The answers to the questions represent information that may be aligned with the contents of the TOGAF Content Framework. How this information is rendered is dependent upon:

- How the EA team is structured
- The tools it uses
- The nature of the EA Repository
- How the EA Capability performs information management

High-functioning teams will take a more rigorous approach to information management (EA Content Framework), employ a more formal architecture description discipline (EA Content Metamodel), and utilize purpose-built modeling and repository management tools (EA Repository). For more detail, see Section 8.4 (Information Managed by the EA Capability).

13.1 Mapping the EA Leader's Guide to TOGAF ADM Phases

The Preliminary Phase is designed as a customized journey of the TOGAF ADM. This journey is predicated on the best practice of developing EA. The ADM is not a linear process model; rather it is a logical method that places key activity steps together for the purpose of understanding the relationship of activity and clarifying information flow. In Table 9 several TOGAF ADM phases are entered iteratively. Partial indicates work only to the extent needed to answer the question at hand. More elaboration can be done in subsequent architecture work.

For a graphical representation of this journey see Figure 19. The graphic in Figure 19 focuses on Phase A. It highlights that in order to complete Phase A, some amount of work is needed in Phases B, C, and D. The ADM is used to develop the EA. There is no difference between exercising the ADM to architect an EA Capability, a finance capability, a portfolio, or an organizational strategy. We are using the concepts of ADM to support two different activities. Application of steps in ADM phases is limited by the context of supporting the EA Capability.

Table 9: Activity and Key Deliverables

Topic	Mapping to TOGAF ADM Phase
Enterprise Context and EA Context (Chapter 4)	Partial Strategic Level Phase B Enterprise context: • Goals, objectives, initiatives, competitive, and tactic analysis • Operating model (partners, suppliers) • Explore what-if scenarios and scorecards EA context specific for the EA Capability: • Goals
Business Objectives for the EA Capability (Chapter 5)	Capability Level Phase A For the EA Capability: • Provide initial goals and objectives • Select a reference EA Capability and maturity model • Candidate EA Capability • Candidate operating model • EA Capability gap and priority roadmap
Architecture Governance (Chapter 6)	Partial Segment/Capability Level Phase B For the enterprise: • Enterprise Risk Management Model • Governance Model For the EA Capability: • Risk Management Model • Governance Model • Extend candidate operating model to include EA governance • Initial Architecture Partition Model • Trace to EA Capability goals

Topic	Mapping to TOGAF ADM Phase
Alignment with Other Frameworks (Chapter 7)	Partial Capability Level Phase B & Partial Phase C (Data) For the enterprise: • Reference models for key frameworks • Capability assessment of key frameworks For the EA Capability: • Framework touch-points • Extend candidate operating model to include other frameworks • Extend EA governance and EA risk management • Initial EA Content Framework aligned to other frameworks and EA governance • Candidate architecture partition model • Trace to EA Capability goals • EA Capability and key framework gap and priority roadmap
Customization of Architecture Contents and Metamodel (Chapter 8)	Capability Level Phase C (Data) For the EA Capability: • EA Content Framework • EA Content Metamodel • Viewpoint Library • Architecture Repository Model • Trace to EA Capability goals • Initial EA Content Framework and architecture repository gap
Organization Model for the EA Team (Chapter 9)	Partial Capability Level Phase B For the EA Capability: • EA organizational model • Select reference EA skills framework • Initial alignment with enterprise job titles and roles • Initial accountability matrix for EA Content Framework and initial architecture repository • Organizational gap and priority roadmap

Topic	Mapping to TOGAF ADM Phase
Process Model (Chapter 10)	Partial Capability Level Phase B Capability Level Phase C (App) and Capability Level Phase D For the enterprise: • Process model highlighting touch-points between EA Capability and enterprise processes the EA Capability supports[20] • Performance matrix for key processes and organization • Accountability matrix for EA Content Framework and organization For the EA Capability: • Process model • Architecture repository application model • Matrix for EA Content Framework and architecture repository application architecture • Process and architecture repository gap and priority roadmap
Create the EA Capability Roadmap (Chapter 11)	Capability Level Phase E Create a roadmap highlighting development of the EA Capability by changes in the: • Organizational model • Process model • EA Content Framework • Architecture repository For the EA Capability: • Trace roadmap to EA Capability goals
Establishing and Evolving the EA Capability (Chapter 12)	Capability Level Phase F and Capability Level Phase G For the enterprise: • Transition the EA Capability Roadmap to an Implementation & Migration Plan For the EA Capability: • Execute the Implementation & Migration Plan to build the EA Capability your enterprise desires

13.2 Mapping EA Content, EA Leader's Approach, and Metamodel

None of the questions or concerns raised in this Guide are purely technical or isolated to a single field or dimension. To deliver on the expectation of EA Capability, other frameworks and best

[20] While this has been stressed in the Guide, align to processes the EA Capability is expected to support based upon its purpose. Do not align to those it could support. Worst practice is to fret over linkage to processes the EA Capability *could* support.

practices should be brought together and customized to meet specific needs of the enterprise's environment, roles, and responsibilities.

Based on the activities discussed in this Guide, here is a sample mapping of information and where it maps to the generic TOGAF Content Metamodel.

Table 10: Mapping to TOGAF Tools & Techniques Content Metamodel

Note: Mapping is dependent upon the final metamodel.

Topic	Content	TOGAF Content Metamodel Grouping
Enterprise Context and EA Context (Chapter 4)	Goals, strategies, objectives, initiatives, success measures Plans (business, strategy, workforce, cash flow) Competitive and tactic analysis, operating model, what-if scenarios, scorecards Locations, partners, suppliers	Business Architecture Portfolio Management Project Management Financial Management
Business Objectives for the EA Capability (Chapter 5)	Strategies, objectives, initiatives, success measures	EA Capability and Maturity Model
Scoping the Depth and Breadth of Business Impact with the EA Capability (Section 9.5)	Process diagrams and models, service and servicing models, portfolio and investments, demand/need descriptions People, skills, organizational charts	Business Architecture EA Capability and Maturity Model Reference Architectures and Standards
Business Objectives for the EA Capability (Chapter 5) Alignment with Other Frameworks (Chapter 7) Organization Model for the EA Team (Chapter 9) Process Model (Chapter 10)	People, skills, organizational charts Customer interaction options, types/modes, tools, demands, security/privacy management plans, operational continuity plans Information system data – requirements, applications, tools, solutions, defects, methods/methodology Geospatial data IT networks and their connectivity/interaction maps	EA Capability and Maturity Model Requirement Management Operating Models Change Management Maturity Management Information Technology Lifecycle Management
Architecture Governance (Chapter 6) Process Model (Chapter 10)	Knowledge management plans, information exchange matrix, events and interactions list, roles, responsibilities, escalation plans	Risk Management Governance Model

Part 6: Appendices

A Partial List of EA Content Frameworks

Table 11 provides a list of alternative EA Content Frameworks. Specific mapping White Papers exist between the TOGAF standard and BIAN, DoDAF, Frameworx, and SABSA (see References).

Table 11: List of EA Content Frameworks

Framework	Framework Description
AGATE	The France DGA Architecture Framework
BIAN	Banking Industry Architecture Network
Deloitte EAF	Deloitte Consulting Enterprise Architecture Framework
DNDAF	The Department of National Defence Architecture Framework (Canada)
DoDAF	The US Department of Defense Architecture Framework
FDIC-EAF	FDIC Enterprise Architecture Framework (US)
FEAF	Federal Enterprise Architecture Framework (US)
Frameworx	TM Forum
GEA	Government Enterprise Architecture – Queensland Government
MoDAF	The UK Ministry of Defense Architecture Framework
NAF	The NATO Architecture Framework
Navigate	Conexiam Enterprise Architecture Content Framework
NIST EA	NIST Enterprise Architecture framework (US)
NORA	Nederlandse Overheid Referentie Architectuur (The Netherlands)
OBASHI	The OBASHI Business & IT Methodology and Framework
OEAF	Oracle Enterprise Architecture Framework
PEAF	Pragmatic Enterprise Architecture Framework
PERA	Purdue Enterprise Reference Architecture Framework
SABSA	The SABSA Institute Enterprise Security Architecture

Framework	Framework Description
TEAF	Treasury Enterprise Architecture Framework (US)
UAF	United Architecture Framework (replacement for UPDM)
UPDM	United Profile for DoDAF and MoDAF
Zachman	Zachman Framework

B Maturity Models

Note that most maturity models use the term "maturity" to measure the ability of an organization to control change of a capability or process; common usage associates maturity with quality of delivery. We recommend you are very clear on your usage and objective when referencing a maturity model.

- US Department of Commerce (DoC) has developed an IT Architecture Capability Maturity Model (ACMM) to aid in conducting internal assessments.
- Software Engineering Institute (SEI) Capability Maturity Model (CMM); refer to: http://cmmiinstitute.com/.
- US Government's Office of the CIO Maturity Models; refer to: http://ocio.os.doc.gov/s/groups/public/@doc/@os/@ocio/@oitpp/documents/content/prod01_002340.pdf and http://ocio.os.doc.gov/ITPolicyandPrograms/Enterprise_Architecture/PROD01_004935.
- National Association of State Chief Information Officers (NASCIO) EA Maturity Model; refer to: www.nascio.org/publications/documents/nascio-eamm.pdf.
- Innovation Value Institute; refer to: http://ivi.nuim.ie/understanding-it-cmf and http://ivi.nuim.ie/service-management-capability-assessment.
- US Government Office of Management and Budget's Enterprise Architecture Assessment Framework; refer to: www.whitehouse.gov/omb/e-gov/eaaf/.

C Suggested Reading

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- Scenarios: The Art of Strategic Conversation, 2nd Edition, Kees van der Heijden, Wiley, 2005.
- Strategy Maps: Converting Intangible Assets into Tangible Outcomes, Robert S. Kaplan, David P. Norton, Harvard Business School Press, Boston, 2004.
- Strategy Safari: A Guided Tour through the Wilds of Strategic Management, H. Mintzberg, J. Lampel, B. Ahlstrand, 2005.
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Acronyms and Abbreviations

ACMM	Architecture Capability Maturity Model
ADM	Architecture Development Method
AEA	Association of Enterprise Architects
APQC	American Productivity and Quality Center
BIAN	Banking Industry Architecture Network
BPMN	Business Process Model and Notation
CAPEX	Capital Expenditure
CEB	Corporate Executive Board
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CISR	Center for Information Systems Research
CMM	Capability Maturity Model
COGS	Cost of Goods Sold
DNDAF	The Department of National Defence Architecture Framework (Canada)
DoC	Department of Commerce (US)
DoDAF	Department of Defense Architecture Framework (US)
EA	Enterprise Architecture
EPCM	Engineering, Procurement, Construction, and Management
ERM	Enterprise Risk Management
FFLV	Functions, Flows (Processes), Layers, and Views
GAAP	Generally Accepted Accounting Principles
IoT	Internet of Things
IRR	Internal Rate of Return
ITGI	IT Governance Institute
M&A	Merger and Acquisition

NASCIO	National Association of State Chief Information Officers
NPV	Net Present Value
OPEX	Operating Expenditure
PMI	Project Management Institute
PMO	Project Management Office
POS	Point of Sale
ROI	Return On Investment
SCOR	Supply Chain Operations Reference (model)
SEI	Software Engineering Institute
SFIA	Skills Framework for the Information Age
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UML	Unified Modeling Language

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