

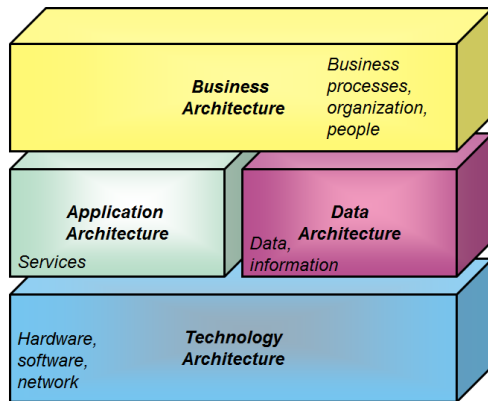
TOGAF Quick Reference

08 November 2017 8:55 PM

Enterprise Architecture is:

- The organizing logic for business processes and IT infrastructure reflecting the integration and standardization requirements of the firm's operating model.[1]
- A conceptual blueprint that defines the structure and operation of an organization. The intent of an enterprise architecture is to determine how an organization can most effectively achieve its current and future objectives. [2]

Architecture Types:-



The Business Architecture defines the business strategy, governance, organization, and key business processes

The Data Architecture describes the structure of an organization's logical and physical data assets and data management resources

The Application Architecture provides a blueprint for the individual applications to be deployed, their interactions, and their relationships to the core business processes of the organization

The Technology Architecture describes the logical software and hardware capabilities that are required to support the deployment of business, data, and application services; this includes IT infrastructure, middleware, networks, communications, processing, standards etc.

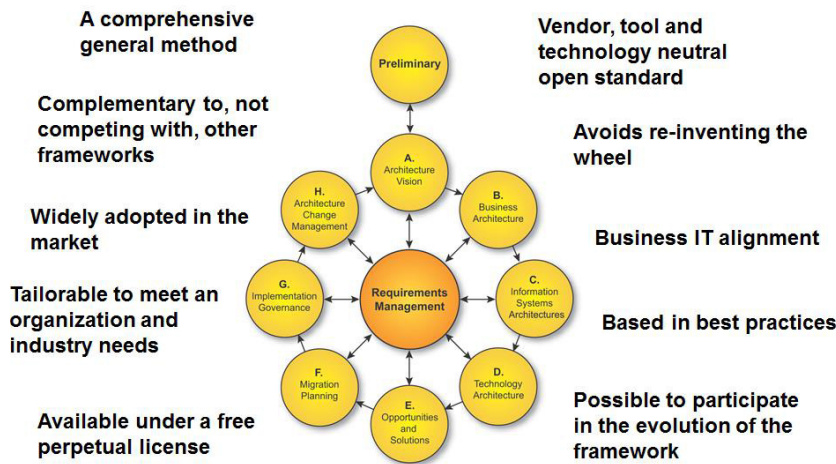
Two key reasons why you need an enterprise architecture:

- Critical to business survival and success
- Enables managed innovation within the enterprise

Business Benefits of Enterprise Architecture

- It helps an organization achieve its business strategy.
- Faster time to market for new innovations and capabilities.
- More consistent business processes and information across business units.
- More reliability, security, and less risk
- A more efficient business operation
- A more efficient IT operation
- Better return on existing investment
- Reduced risk for future investment
- Faster, simpler, and cheaper procurement

ADM (Architecture Development Method):-



Preliminary Phase: This phase includes the preparation and initiation activities to create an Architecture Capability.

- Understand business environment
- High level management commitment
- Agreement on scope
- Establish principles
- Establish governance structure
- Customization of TOGAF

Architecture Vision (Phase A):

- Initiates one iteration of the architecture process
 - Sets scope, constraints, expectations
 - Required at the start of every architecture cycle
- Creates the Architecture Vision
- Validates business context
- Creates Statement of Architecture work

Business Architecture (Phase B): The fundamental organization of a business, embodied in:

- its business processes and people;
- their relationships to each other and the environment; and
- the principles governing its design and evolution.

It shows how the organization meets its business goals.

Business Architecture Steps:

- Select reference models, viewpoints and tools
- Define Baseline Architecture Description
- Define Target Architecture Description
- Perform gap analysis
- Define candidate roadmap components
- Conduct formal stakeholder review
- Finalize the Architecture
- Create Architecture Definition Document

Information Systems Architecture (Phase C): The fundamental organization of an IT system, embodied in:

- the major types of information and applications that process them;
- relationships to each other and the environment; and
- the principles governing its design and evolution.

It shows how the IT systems meets the business goals of the enterprise.

Technology Architecture (Phase D): The fundamental organization of an IT system, embodied in:

- It's hardware, software, and communications technology;
- their relationships to each other and the environment; and
- the principles governing its design and evolution

Opportunities and Solutions (Phase E):

- Perform initial implementation planning

- Identify the major implementation projects
- Determine if an incremental approach is required, if so define Transition Architectures
- Decide on approach
 - a. Make v Buy v Re-Use
 - b. Outsource
 - c. COTS
 - d. Open Source
- Assess priorities
- Identify dependencies

Migration Planning (Phase F):

- For work packages and projects identified in Phase E perform:
 - Cost/benefit analysis
 - Risk assessment
- Finalize a detailed Implementation and Migration Plan

Implementation and Governance (Phase G):

- Provides architectural oversight for the implementation
- Defines architecture constraints on implementation projects
- Governs and manages an Architecture contract
- Monitors implementation work for conformance
- Produces a Business Value Realization

Architecture Change Management (Phase H):

- Provides continual monitoring and a change management process
- Ensures that changes to the architecture are managed in a cohesive and architected way
- Establishes and supports the Enterprise Architecture to provide flexibility to evolve rapidly in response to changes in the technology or business environment
- Monitors the business and capacity management.

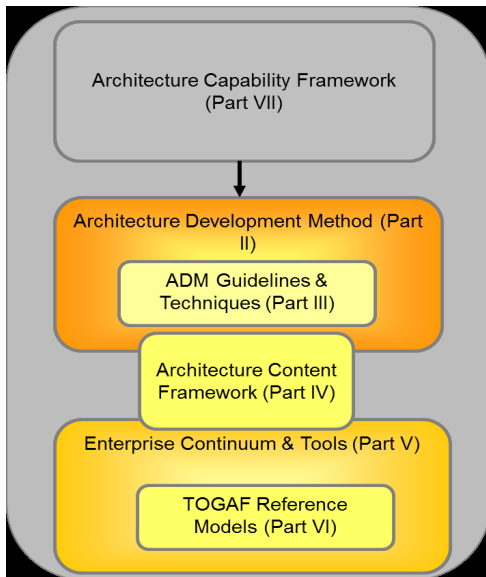
TOGAF - a framework and method for achieving the 'Boundaryless Information Flow' vision

TOGAF 9 Components:

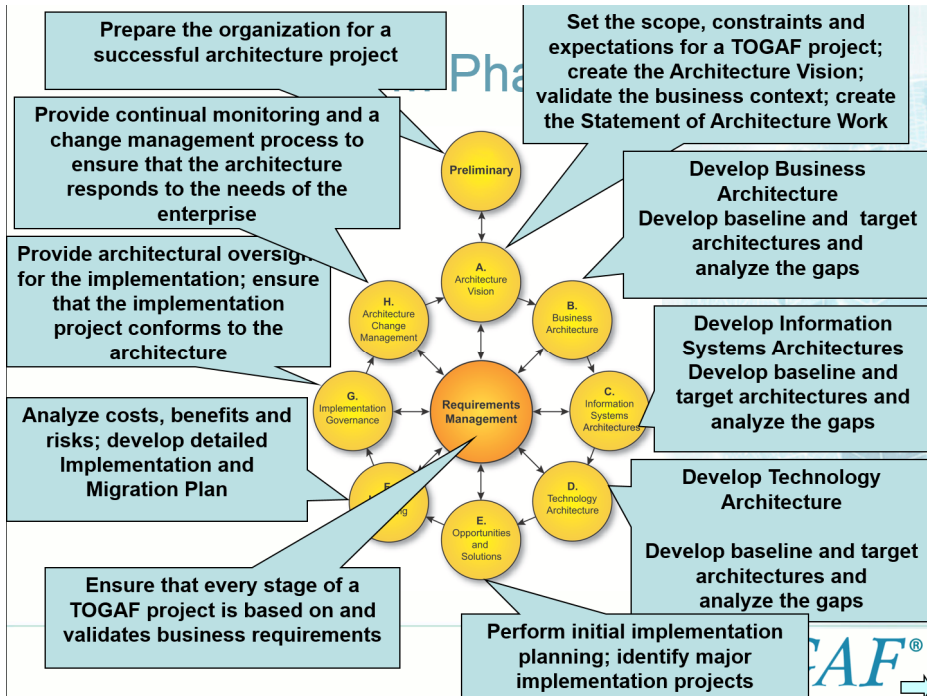
- **Architecture Development Method (ADM):** An iterative sequence of steps to develop an enterprise-wide architecture.
- **ADM Guidelines and Techniques:** Guidelines and techniques to support the application of the ADM.
- **Architecture Content Framework:** A detailed model of architectural work products, including deliverables, artifacts within deliverables, and the Architecture Building Blocks (ABBs) that deliverables represent.
- **The Enterprise Continuum:** A model for structuring a virtual repository and methods for classifying architecture and solution artifacts.
- **TOGAF Reference Models:**
 - The TOGAF Technical Reference Model (TRM)
 - The Integrated Information Infrastructure Model (III-RM)
- **The Architecture Capability Framework:** A structured definition of the organizations, skills, roles, and responsibilities to establish and operate an Enterprise Architecture

Boundaryless Information Flow

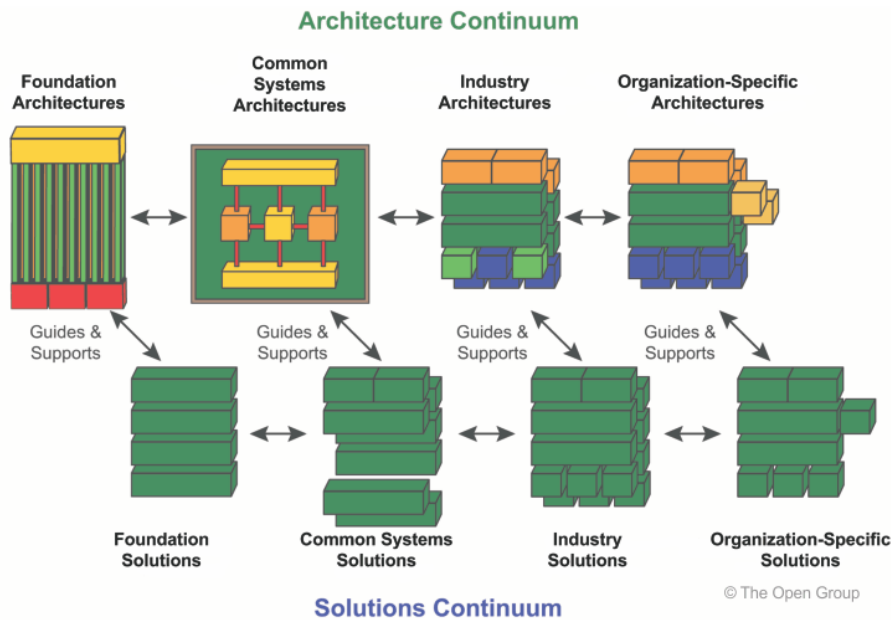
- Access to integrated information to support business process improvements
- An infrastructure that provides Boundaryless Information Flow has open standard components that provide services in a customer's extended enterprise that:
 - Combine multiple sources of information
 - Securely deliver the information whenever and wherever it is needed, in the right context for the people or systems using that information



ADM Phases:-



Enterprise Continuum:-



The Enterprise Continuum is a combination of two complementary concepts: the Architecture Continuum and the Solutions Continuum. Enterprise Continuum:

- enables effective use of COTS products.
- improves engineering efficiency
- aids organization of reusable architecture and solution assets
- provides a common language within enterprises and between customer enterprises and vendors

The Enterprise Continuum is:

- The Enterprise Continuum provides a view of the Architecture Repository that shows the evolution of these related architectures from generic to specific, from abstract to concrete, and from logical to physical
- A model for structuring a virtual repository and methods for classifying architecture and solution artifacts.
- It enables the organization of reusable architecture and solution assets.
- It is also an aid to communication between all architects involved in. building and procuring an architecture by providing a common language and terminology.
- This in turn enables efficiency in engineering and effective use of COTS products.
- The Enterprise Continuum provides an overall context for architectures and solutions and classifies assets that apply across the entire scope of the enterprise.
- The Architecture Continuum provides a classification mechanism for assets that collectively define the architecture at different levels of evolution from generic to specific.
- The Solutions Continuum provides the classification for assets to describe specific solutions for the organization that can be implemented to achieve the intent of the architecture.
- Tools are needed to manage artifacts within the Enterprise Continuum
- TOGAF provides an introduction to issues in Tools Standardization

At a high level, the following classes of architectural information are expected to be held within an Architecture Repository:

- The **Architecture Metamodel** describes the organizationally tailored application of an architecture framework, including a method for architecture development and a metamodel for architecture content
- The **Architecture Capability** defines the parameters, structures, and processes that support governance of the Architecture Repository
- The **Architecture Landscape** presents an architectural representation of assets in use, or planned, by the enterprise at particular points in time
- The **Standards Information Base** captures the standards with which new architectures must comply, which may include industry standards, selected products and services from suppliers, or shared services already deployed within the organization
- The **Reference Library** provides guidelines, templates, patterns, and other forms of reference material that can be leveraged in order to accelerate the creation of new architectures for the enterprise
- The **Governance Log** provides a record of governance activity across the enterprise
- The **Architecture Requirements Repository** provides a view of all authorized architecture requirements which have been agreed with the Architecture Board
- The **Solutions Landscape** presents an architectural representation of the Solution Building Blocks (SBBs) supporting the Architecture

Landscape which have been planned or deployed by the enterprise

ADM Guidelines and Techniques

Guidelines for Adapting the ADM Process

The Architecture Development Method (ADM) process can be adapted to deal with a number of different usage scenarios, including different process styles (e.g., the use of iteration) and also specific specialist architectures (such as security). Guidelines included within this part are as follows:

- Applying Iteration to the ADM - discusses the concept of iteration and shows potential strategies for applying iterative concepts to the ADM
- Applying the ADM across the Architecture Landscape - discusses the different types of architecture engagement that may occur at different levels of the enterprise

Techniques for Architecture Development

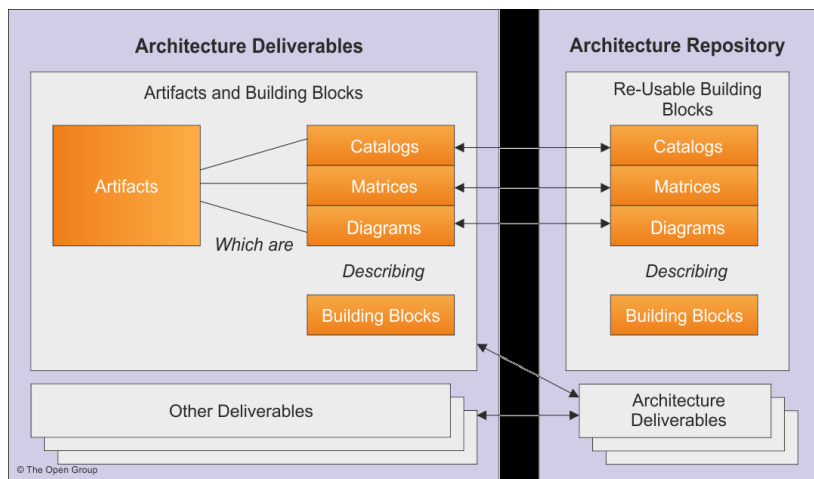
- **Architecture Principles** - principles for the use and deployment of IT resources across the enterprise — describes how to develop the set of general rules and guidelines for the architecture being developed
- **Stakeholder Management** - describes stakeholder management, an important discipline that successful architecture practitioners can use to win support for their projects
- **Architecture Patterns** - provides guidance on using architectural patterns
- **Gap Analysis** - describes the technique known as gap analysis; it is widely used in the TOGAF ADM to validate an architecture that is being developed
- **Migration Planning Techniques**
- **Interoperability Requirements** - describes a technique for determining interoperability requirements
- **Business Transformation Readiness Assessment** - describes a technique for identifying business transformation issues
- **Risk Management** - describes a technique for managing risk during an architecture/business transformation project
- **Capability-Based Planning** - describes the technique of capability-based planning

Architecture Content Framework:

The Framework has 3 categories for describing work products:

- Deliverables
- Artifacts
- Building blocks

Relationship between Deliverables, Artifacts, and Building blocks:



The Architecture Content Framework presents outputs in a consistent and structured way.

- It has 3 categories of work products: deliverables, artifacts, and building blocks.
- The content metamodel consists of a core and some extensions.
- Catalogs, matrices, and diagrams are used to present the architectural information.
- There is a mapping from the Architecture content framework to the TOGAF ADM phases

Building Blocks

Building blocks have generic characteristics as follows:

- A building block is a package of functionality defined to meet the business needs across an organization
- A building block has a type that corresponds to the enterprise's content metamodel (such as actor, business service, application, or data entity)
- A building block has a defined boundary and is generally recognizable as "a thing" by domain experts
- A building block may interoperate with other, inter-dependent building blocks

A good building block has the following characteristics:

- It considers implementation and usage, and evolves to exploit technology and standards
- It may be assembled from other building blocks
- It may be a subassembly of other building blocks
- Ideally a building block is re-usable and replaceable, and well specified

Architecture Building Blocks (ABBs) Characteristics:

- Capture architecture requirements; e.g., business, data, application, and technology requirements
- Direct and guide the development of SBBs

Solution Building Blocks (SBBs) Characteristics:

- Define what products and components will implement the functionality
- Define the implementation
- Fulfil business requirements
- Are product or vendor-aware

An architecture is a set of building blocks depicted in an architectural model, and a specification of how those building blocks are connected to meet the overall requirements of the business

Content Metamodel

A TOGAF architecture is based on:

- Defining architectural building blocks within architecture catalogs.
- Specifying the relationships between those building blocks in architecture matrices.
- Presenting communication diagrams that show in a precise way what the architecture is.

The metamodel is structured into Core and Extension content. Core content is designed not to be altered.

- In order to support many scenarios the metamodel has been partitioned into core and extension content.
- The core provides a minimum set of architectural content to support traceability across artifacts.
- The extension content allows for more specific or more in-depth modeling.

Preliminary Phase

Preliminary Phase			
Objectives	Steps	Inputs	Outputs
Determine the Architecture Capability desired by the organization: <ul style="list-style-type: none"> Review the organizational context for conducting enterprise architecture Identify and scope the elements of the enterprise organizations affected by the Architecture Capability Identify the established frameworks, methods, and processes that intersect with the Architecture Capability Establish Capability Maturity target 	Scope the enterprise organizations impacted Confirm governance and support frameworks Define and establish enterprise architecture team and organization	TOGAF Other architecture framework(s) Board strategies, business plans, business strategy, IT Strategy, business principles, business goals, and business drivers Governance and legal frameworks Architecture capability Partnership and contract agreements	Organizational Model for Enterprise Architecture Tailored Architecture Framework, including architecture principles Initial Architecture Repository Restatement of, or reference to, business principles, business goals, and business drivers Request for Architecture Work Architecture Governance Framework
Establish the Architecture Capability: <ul style="list-style-type: none"> Define and establish the Organizational Model for Enterprise Architecture Define and establish the detailed process and resources for architecture governance Select and implement tools that support the architecture activity Define the Architecture Principles 	Tailor TOGAF and, if any, other selected Architecture Frameworks Implement architecture tools	Existing organizational model for enterprise architecture Existing architecture framework, if any, including: <ul style="list-style-type: none"> Architecture method Architecture content Configured and deployed tools Architecture Principles Architecture Repository 	

Architecture Governance

- Phase G of the TOGAF ADM is about Implementation Governance, the realization of architecture through change projects.
- Architecture Governance covers management and controls of all aspects of the development and evolution of enterprise architectures.
- The Architecture Governance Framework is generic and can be adapted to an existing governance environment. It helps identifying effective processes and organizational structures, so that the business responsibilities can be elucidated, communicated, and managed

Benefits of Architecture Governance

- Links processes, resources, and information to organizational strategies and objectives.
- Integrates and institutionalizes best practices.
- Aligns with industry frameworks.
- Enables the organization to take full advantage of its assets.
- Protects the underlying digital assets of the organization.
- Supports regulatory and best practice requirements.
- Promotes visible risk management.

Architecture Board Responsibilities

- Providing the basis for all decision-making with regard to changes to the architectures.
- Ensuring consistency between sub-architectures.
- Establishing targets for re-use of components.
- Ensuring flexibility of enterprise architecture:
 - To meet changing business needs.
 - To leverage new technologies.
- Enforcement of Architecture Compliance.
- Improving the architecture maturity level within the organization.
- Ensuring that the discipline of architecture-based development is adopted.
- Supporting a visible escalation capability for out-of-bounds decisions.

Architecture Governance Summary

- Architecture governance is the practice and orientation by which enterprise architectures and other architectures are managed and controlled at an enterprise-wide level.
- Implementing a system of controls over the creation and monitoring of all architecture components and activities, to ensure the effective introduction, implementation, and evolution of architectures within the organization.

- Implementing a system to ensure compliance with internal and external standards and regulatory obligations.
- Establishing processes that support effective management of these processes.
- Developing practices that ensure accountability to identified stakeholders, inside and outside the organization

Business Scenarios

A good business scenario:

- Is representative of a significant business need or problem.
- Enables vendors to understand the value of a developed solution to a customer.
- Is "SMART".
- S- Specific, M- Measurable, A- Actionable, R- Realistic, T- Time-bound
- Business scenarios help address one of the most common issues facing businesses
 - Aligning the IT with the business
- Business scenarios help to identify and understand business needs
 - And thereby derive business requirements
- They are just a technique, not the goal
 - They are part of the larger process of architecture development

Stakeholders Management

Step 1: Identify Stakeholders

Step 2: Classify Stakeholder Positions

Step 3: Determine Stakeholder Management Approach

Step 4: Tailor Engagement Deliverables

- Stakeholder Management is an important discipline that successful architecture practitioners can use to win support from others.
- Identifies the most powerful stakeholders early and ensures their input is used to shape the architecture.
- Explicitly identifies viewpoints to address stakeholder concerns.

Views and Viewpoints

Building Blocks

Architecture Building Blocks (ABBs)

Architecture documents and models from the enterprise' Architecture Continuum. They are defined or selected during application of the ADM; mainly in Phases A, B, C, and D.

The characteristics of Architecture Building Blocks are as follows:

- They define what functionality will be implemented
- They capture business and technical requirements
- They are technology-aware
- They direct and guide the development of Solution Building Blocks

Solutions Building Blocks relate to the Solutions Continuum. They can either be procured or developed

The characteristics Solution Building Blocks are as follows:

- They define what products and components will implement the functionality
- They define the implementation
- They fulfil business requirements
- They are product or vendor-aware

Building Blocks and the ADM

An architecture is a set of building blocks depicted in an architectural model. It is a specification of how those building blocks are connected to meet the overall requirements of an information system.

The various building blocks in an architecture specify the services required in an enterprise specific system. The following general principles should apply:

- An architecture need only contain building blocks to implement those services it requires.
- Building blocks may implement one, more than one, or only part of a service identified in the architecture.
- Building blocks should conform to standards.

Architecture Implementation Support Techniques

Interoperability and the ADM

The determination of interoperability occurs throughout the ADM:

- Architecture Vision: the nature and security considerations of information and service exchanges are found using business scenarios.
- Business Architecture: information and service exchanges are defined in business terms.
- Data Architecture: the content of information exchanges is detailed using the corporate data and/or information exchange model.
- Application Architecture: the way applications are to share information and services is specified.
- Technology Architecture: appropriate technical mechanisms to permit information and service exchanges are specified.
- Opportunities & Solutions: actual solutions are selected.
- Migration Planning: interoperability is implemented logically.

Risk Management in the ADM

There are two levels of risk that should be considered:

1. Initial Level of Risk: Risk categorization prior to determining and implementing mitigating actions.
2. Residual Level of Risk: Risk categorization after implementation of mitigating actions

The process for risk management is:

- Risk classification
- Risk identification
- Initial risk assessment
- Risk mitigation and residual risk assessment
- Risk monitoring

Initial Risk Assessment

The initial risk assessment is done by classifying risks with respect to effect and frequency. The effect can be assessed as:

- Catastrophic: critical financial loss that could result in bankruptcy.
- Critical: serious financial loss in more than one line of business leading to a loss in productivity and ROI
- Marginal: minor financial loss in a line of business and a reduced ROI on the IT investment.
- Negligible: minimal impact on services and/or products.

The frequency can be assessed as:

- Frequent: Likely to occur very often and/or continuously.
- Likely: Occurs several times over the course of a transformation cycle.
- Occasional: Occurs sporadically.
- Seldom: Remotely possible and would probably occur not more than once in the course of a transformation cycle.
- Unlikely: Will probably not occur during the course of a transformation cycle

The assessments of effect and frequency can then be combined:

- Extremely High Risk (E): The transformation will most likely fail with severe consequences.
- High Risk (H): Significant failure of parts of the transformation resulting in certain goals not being achieved.
- Moderate Risk (M): Noticeable failure of parts of the transformation, threatening the success of some goals.
- Low Risk (L): Some goals will not be wholly successful.

Phase A: Architecture Vision

Phase A: Architecture Vision			
Objectives	Steps	Inputs	Outputs
<p>Develop a high-level aspirational vision of the capabilities and business value to be delivered as a result of the proposed enterprise architecture</p> <p>Obtain approval for a Statement of Architecture</p> <p>Work that defines a program of works to develop and deploy the architecture outlined in the Architecture Vision</p>	<p>Establish the architecture project</p> <p>Identify stakeholders, concerns, and business requirements</p> <p>Confirm and elaborate business goals, business drivers, and constraints</p> <p>Evaluate business capabilities</p> <p>Assess readiness for business transformation</p> <p>Define scope</p> <p>Confirm and elaborate architecture principles, including business principles</p> <p>Develop Architecture Vision</p> <p>Define the Target Architecture value propositions and KPIs</p> <p>Identify business transformation risks and mitigation activities</p> <p>Develop Statement of Architecture Work; secure approval</p>	<p>Request for Architecture Work</p> <p>Business principles, business goals, and business drivers</p> <p>Organizational Model for Enterprise Architecture</p> <p>Tailored Architecture Framework, including tailored architecture method, architecture content, architecture principles, configured and deployed tools</p> <p>Populated Architecture Repository; that is, existing architecture documentation (framework description, architecture descriptions, existing baseline descriptions, etc.)</p>	<p>Approved Statement of Architecture Work</p> <p>Refined statements of business principles, business goals, and business drivers</p> <p>Architecture principles</p> <p>Capability Assessment</p> <p>Tailored Architecture Framework</p> <p>Architecture Vision, including:</p> <ul style="list-style-type: none"> ▪ Refined key high-level stakeholder requirements <p>Draft Architecture Definition Document, including (when in scope):</p> <ul style="list-style-type: none"> ▪ Baseline Business Architecture (high-level) ▪ Baseline Data Architecture (high-level) ▪ Baseline Application Architecture (high-level) ▪ Baseline Technology Architecture (high-level) ▪ Target Business Architecture (high-level) ▪ Target Data Architecture (high-level) ▪ Target Application Architecture (high-level) ▪ Target Technology Architecture (high-level) <p>Communications Plan</p> <p>Additional content populating the Architecture Repository</p>

Phase B: Business Architecture

Catalogs, Matrices and Diagrams

Catalogs

- Organization/Actor catalog
- Driver/Goal/Objective catalog
- Role catalog
- Business Service/Function catalog
- Location catalog
- Process/Event/Control/Product catalog
- Contract/Measure catalog

Matrices

- Business Interaction matrix
- Actor/Role matrix

Diagrams

- Business Footprint diagram
- Business Service/Information diagram
- Functional Decomposition diagram
- Product Lifecycle diagram
- Goal/Objective/Service diagram
- Use-Case diagram
- Organization Decomposition diagram
- Process Flow diagram
- Event diagram

The objectives of Phase B:

- Develop the target business architecture describing how the enterprise needs to operate to achieve the business goals, how it responds to the strategic drivers set out in the Architecture Vision, and how it addresses the Request for Architecture Work and stakeholder concerns.
- identify candidate architecture roadmap components based upon gaps between the baseline and target business architectures

Approach:

- Scope depends on existing strategy and planning:
 - Update and verify the currently documented business strategy and plans
 - Bridge between high-level business drivers, strategy, goals, and specific business requirements
 - Existing architecture discovery must include all relevant detail
- If there is no existing strategy or planning:
 - Identify any existing architecture definitions, and then verify and update them

- New process definitions may require detailed work
- In both cases, use business scenarios to identify key business objectives and processes.

Inputs

- Request for Architecture Work
- Refined statements of business principles, goals and drivers
- Capability assessment
- Communications plan
- Organization model for enterprise architecture
- Tailored architecture framework
- Approved Statement of Architecture Work
- Architecture principles
- Enterprise Continuum
- Architecture Repository
- Architecture Vision
- Draft Architecture Definition Document

Steps

1. Select reference models, viewpoints, and tools
2. Develop Baseline Business Architecture Description
3. Develop Target Business Architecture Description
4. Perform gap analysis
5. Define candidate roadmap components
6. Resolve impacts across the Architecture Landscape
7. Conduct formal stakeholder review
8. Finalize the Business Architecture
9. Create Architecture Definition Document

Outputs

- Statement of Architecture Work
- Validated business principles, goals, and drivers
- Elaborated Business Architecture principles
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification
- Business architecture components of an Architecture Roadmap

Phase C: Data Architecture

Objectives:

- Develop the target information systems (data and application) architecture, describing how the enterprise's information systems architecture will enable the business architecture and the architecture vision, in a way that addresses the Request for Architecture Work and stakeholder concerns
- Identify candidate architecture roadmap components based upon gaps between the baseline and target information systems (data and application) architectures

Approach:

Phase C involves data and applications architecture, in either order. Advocates exist for both sequences:

- Spewak's Enterprise Architecture Planning recommends a data-driven sequence.
- Major applications systems (ERP, CRM, and others) often combine technology infrastructure and application logic. An application-driven approach takes core applications (underpinning mission-critical business processes) as the primary focus of the architecture effort.
- Integration issues often constitute a major challenge

Inputs

- Request for Architecture Work
- Capability assessment
- Communications plan
- Organization model for enterprise architecture
- Tailored architecture framework
- Data/application principles
- Statement of Architecture Work

- Architecture Vision
- Architecture Repository
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification, including:
 - Gap analysis results
 - Relevant technical requirements
- Business architecture components of an architecture roadmap

Steps

1. Select reference models, viewpoints, and tools
2. Develop Baseline Data Architecture Description
3. Develop Target Data Architecture Description
4. Perform gap analysis
5. Define candidate roadmap components
6. Resolve impacts across the Architecture Landscape
7. Conduct formal stakeholder review
8. Finalize the Data Architecture
9. Create Architecture Definition Document

Outputs

- Statement of Architecture Work
- Validated data principles or new data principles
- Draft Architecture Definition Document
- Draft Architecture Requirements Specification
- Data architecture components of an Architecture Roadmap

Catalogs:

- Data entity/data component catalog

Matrices:

- Data entity/business function matrix
- System/data matrix

Diagrams:

- Class diagram
- Data Dissemination diagram
- Data Security diagram
- Class Hierarchy diagram
- Data Migration diagram
- Data Lifecycle diagram

Catalog	Purpose
•Data entity/data component catalog	<p>To identify and maintain a list of all the data used across the enterprise, including data entities and also the data components where data entities are stored</p> <p>It contains the following metamodel entities:</p> <ul style="list-style-type: none"> •Data entity •Logical data component •Physical data component

Data Entity/Business Function Matrix

The purpose of the Data Entity/Business Function matrix is to depict the relationship between data entities and business functions within the enterprise.

- The mapping of the Data entity-business function relationship enables the following to take place:
 - Assignment of ownership of data entities to organizations
 - Understand the data and information exchange requirements business services
 - Support the gap analysis and determine whether any data entities are missing and need to be created
 - Define system of origin, system of record, and system of reference for data entities
 - Enable development of data governance programs across the enterprise (establish data steward, develop data standards pertinent to the business function, etc.)

BUSINESS FUNCTION (Y-AXIS) / DATA ENTITY (X-AXIS)	CUSTOMER MASTER	BUSINESS PARTNER	CUSTOMER LEADS	PRODUCT MASTER
Customer relationship management	<ul style="list-style-type: none"> Business partner data management service Owner—Sales and marketing business unit executives Function can create, read, update, and delete customer master data 	<ul style="list-style-type: none"> Business partner data management service Owner of data entity (person or organization) Function can create, read, update and delete data 	<ul style="list-style-type: none"> Lead processing service Owner—Customer Relationship Manager Function can only Create, read, and update customer leads 	<ul style="list-style-type: none"> N/A
Supply Chain Management	<ul style="list-style-type: none"> Customer requirement processing service Owner—Supply Chain Manager 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Product data management service Owner – Global product development organization

Application/Data Matrix

The purpose of the Application/Data matrix is to depict the relationship between applications and the data entities that are accessed and updated by them.

Applications will create, read, update, and delete specific data entities that are associated with them. For example, a CRM application will create, read, update, and delete customer entity information.

APPLICATION (Y-AXIS) AND DATA (X-AXIS)	DESCRIPTION OR COMMENTS	DATA ENTITY	DATA ENTITY TYPE
CRM	<ul style="list-style-type: none"> System of record for customer master data 	<ul style="list-style-type: none"> Customer data 	<ul style="list-style-type: none"> Master data
Commerce engine	<ul style="list-style-type: none"> System of record for order book 	<ul style="list-style-type: none"> Sales orders 	<ul style="list-style-type: none"> Transactional data
Sales business warehouse	<ul style="list-style-type: none"> Warehouse and data mart that supports the North American region 	<ul style="list-style-type: none"> Intersection of multiple data entities (Example: all sales orders by customer XYZ and by month for the year 2006) 	<ul style="list-style-type: none"> Historical data

Data Architecture Components - Architecture Definition Document

- Baseline data architecture, if appropriate
- Target data architecture, including the following:
 - Business data model
 - Logical data model
 - Data management process models
 - Data Entity/Business Function matrix
- Data architecture views corresponding to the selected viewpoints addressing key stakeholder concerns

Data Architecture Components - Architecture Requirements Specification

- Gap analysis results
- Data interoperability requirements
- Areas where the business architecture may need to change to comply with changes in the data architecture
- Constraints on the technology architecture that is to be designed
- Updated business/application/data requirements, if appropriate

Phase C: Information Systems Architectures – Data Architecture			
Objectives	Steps	Inputs	Outputs
<p>Develop the Target Data Architecture that enables the Business Architecture and the Architecture Vision, while addressing the Request for Architecture Work and stakeholder concerns</p> <p>Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Data Architectures</p>	<p>Select reference models, viewpoints, and tools</p> <p>Develop Baseline Data Architecture Description</p> <p>Develop Target Data Architecture Description</p> <p>Perform gap analysis</p> <p>Define candidate roadmap components</p> <p>Resolve impacts across the Architecture Landscape</p> <p>Conduct formal stakeholder review</p> <p>Finalize the Data Architecture</p> <p>Create Architecture Definition Document</p>	<p>Request for Architecture Work</p> <p>Capability Assessment</p> <p>Communications Plan</p> <p>Organizational Model for Enterprise Architecture</p> <p>Tailored Architecture Framework</p> <p>Data principles</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Draft Architecture Definition Document containing:</p> <ul style="list-style-type: none"> * Baseline Business Architecture (detailed) * Target Business Architecture (detailed) * Baseline Data Architecture (high-level) * Target Data Architecture (high-level) * Baseline Application Architecture (detailed or high-level) * Target Application Architecture (detailed or high-level) * Baseline Technology Architecture (high-level) * Target Technology Architecture (high-level) <p>Draft Architecture Requirements Specification including:</p> <ul style="list-style-type: none"> * Gap analysis results * Relevant technical requirements * Business Architecture components of an Architecture Roadmap 	<p>Statement of Architecture Work, updated if necessary</p> <p>Validated data principles, or new data principles</p> <p>Draft Architecture Definition Document containing content updates:</p> <ul style="list-style-type: none"> * Baseline Data Architecture * Target Data Architecture * Data Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns <p>Draft Architecture Requirements Specification including content updates:</p> <ul style="list-style-type: none"> * Gap analysis results * Data interoperability requirements * Relevant technical requirements that will apply to this evolution of the architecture development cycle * Constraints on the Technology Architecture * Updated business requirements * Updated application requirements <p>Data Architecture components of an Architecture Roadmap</p>

The Integrated Information Infrastructure Reference Model (III-RM)

Key Business and Technical Drivers

Problem Space: The Need for Boundaryless Information Flow

- The problem of getting information to the right people at the right time in a secure, reliable manner

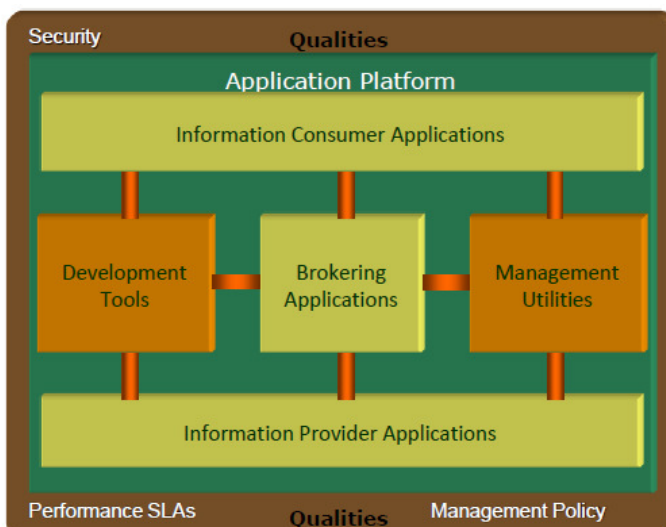
Solution Space: The Need for Integrated Information Infrastructure

- Integrated information is needed so that different and potentially conflicting pieces of information are not distributed throughout different systems.
- Integrated access to that information is required so that the staff can access all the information they need and have a right to do so, through one convenient interface.

The infrastructure that enables this vision is called “integrated information infrastructure”

Integrated Information Infrastructure Reference Model is a model of the key components for developing, managing, and operating an integrated information infrastructure. It supports the Boundaryless Information Flow.

- A model of a set of applications that sit on top of an application platform
- An expanded subset of the TOGAF Technical Reference Model (TRM), which uses different orientations



Phase C: Application Architecture

Catalogs

- Application Portfolio catalog
- Interface catalog

Matrices

- Application/Organization matrix
- Role/Application matrix
- Application/Function matrix
- Application Interaction matrix

Diagrams

- Application Communication diagram
- Application and User Location diagram
- Application Use-Case diagram
- Enterprise Manageability diagram
- Process/Application Realization diagram
- Software Engineering diagram
- Application Migration diagram
- Software Distribution diagram

Phase C: Information Systems Architectures – Application Architecture			
Objectives	Steps	Inputs	Outputs
Develop the Target Application Architecture that enables the Business Architecture and the Architecture Vision, while addressing the Request for Architecture Work and stakeholder concerns	Select reference models, viewpoints, and tools	Request for Architecture Work Capability Assessment Communications Plan Organizational Model for Enterprise Architecture Tailored Architecture Framework	Statement of Architecture Work, updated if necessary
Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Application Architectures	Develop Baseline Application Architecture Description	Application principles Statement of Architecture Work Architecture Vision Architecture Repository	Validated application principles, or new application principles
	Develop Target Application Architecture Description		Draft Architecture Definition Document containing content updates: <ul style="list-style-type: none">•• Baseline Application Architecture•• Target Application Architecture•• Application Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns
	Perform gap analysis		
	Define candidate roadmap components	Draft Architecture Definition Document containing: <ul style="list-style-type: none">•• Baseline Business Architecture (detailed)•• Target Business Architecture (detailed)•• Baseline Data Architecture (detailed or high-level)•• Target Data Architecture (detailed or high-level)•• Baseline Application Architecture (high-level)•• Target Application Architecture (high-level)•• Baseline Technology Architecture (high-level)•• Target Technology Architecture (high-level)	
	Resolve impacts across the Architecture Landscape		Draft Architecture Requirements Specification including content updates: <ul style="list-style-type: none">•• Gap analysis results•• Application interoperability requirements•• Relevant technical requirements that will apply to this evolution of the architecture development cycle•• Constraints on the Technology Architecture•• Updated business requirements•• Updated data requirements•• Application Architecture components of an Architecture Roadmap
	Conduct formal stakeholder review		
	Finalize the Application Architecture	Draft Architecture Requirements Specification including: <ul style="list-style-type: none">•• Gap analysis results•• Relevant technical requirements•• Business and Data Architecture components of an Architecture Roadmap	
	Create Architecture Definition Document		

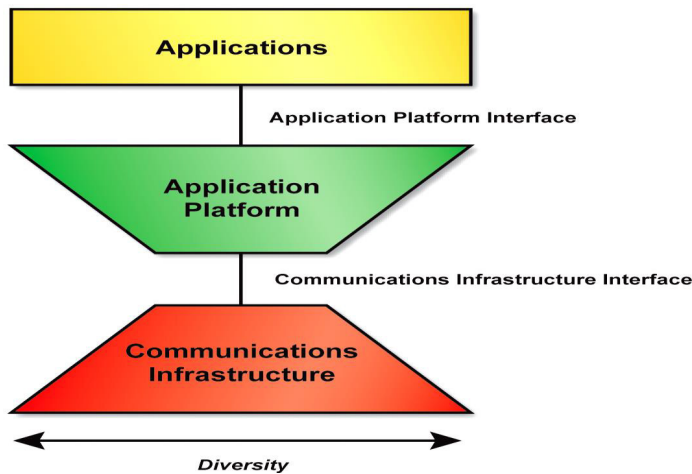
TOGAF Foundation Architecture (TRM)

A Foundation Architecture is an architecture of building blocks and corresponding standards that supports all the Common Systems Architectures and, therefore, the complete enterprise operating environment.

- TOGAF provides a TRM Foundation Architecture. The TRM is an example of a Foundation architecture on which other, more specific architectures can be based.
- The ADM supports specialization of such Foundation Architectures in order to create organization-specific models

The TRM has two main components:

- A taxonomy that defines terminology and provides a coherent description of the components and conceptual structure of an information system.
- An associated TRM graphic that provide a visual representation as an aid to understanding



Taxonomy of Platform Services

- The taxonomy of platform services defines terminology.
- It provides a coherent description of an information system and includes:
 - Components termed service categories
 - Conceptual structure
- It is a widely-acceptable, useful, consistent and structured definition of the Application Platform entity

Phase D: Technology Architecture

Approach

Review the Technology Architecture Resources available in the Architecture Repository, including:

- Existing IT Services in the IT Repository or IT Service Catalog
- The TOGAF TRM
- Technology models relevant to the organization

Phase D: Technology Architecture			
Objectives	Steps	Inputs	Outputs
<p>Develop the Target Technology Architecture that enables the logical and physical application and data components and the Architecture Vision, addressing the Request for Architecture Work and stakeholder concerns</p> <p>Identify candidate Architecture Roadmap components based upon gaps between the Baseline and Target Technology Architectures</p>	<p>Select reference models, viewpoints, and tools</p> <p>Develop Baseline Technology Architecture Description</p> <p>Develop Target Technology Architecture Description</p> <p>Perform gap analysis</p> <p>Define candidate roadmap components</p> <p>Resolve impacts across the Architecture Landscape</p> <p>Conduct formal stakeholder review</p> <p>Finalize the Technology Architecture</p> <p>Create Architecture Definition Document</p>	<p>Request for Architecture Work</p> <p>Capability Assessment</p> <p>Communications Plan</p> <p>Organizational Model for Enterprise Architecture</p> <p>Tailored Architecture Framework</p> <p>Technology principles</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Draft Architecture Definition Document containing:</p> <ul style="list-style-type: none"> • Baseline Business Architecture (detailed) • Target Business Architecture (detailed) • Baseline Data Architecture (detailed) • Target Data Architecture (detailed) • Baseline Application Architecture (detailed) • Target Application Architecture (detailed) • Baseline Technology Architecture (high-level) • Target Technology Architecture (high-level) <p>Draft Architecture Requirements Specification including:</p> <ul style="list-style-type: none"> • Gap analysis results • Relevant technical requirements <p>Business, Data, and Application Architecture components of an Architecture Roadmap</p>	<p>Statement of Architecture Work, updated if necessary</p> <p>Validated technology principles or new technology principles (if generated here)</p> <p>Draft Architecture Definition Document containing content updates:</p> <ul style="list-style-type: none"> • Baseline Technology Architecture • Target Technology Architecture • Technology Architecture views corresponding to the selected viewpoints, addressing key stakeholder concerns <p>Draft Architecture Requirements Specification including content updates:</p> <ul style="list-style-type: none"> • Gap analysis results • Requirements output from Phases B and C • Updated technology requirements <p>Technology Architecture components of an Architecture Roadmap</p>

Catalogs, Matrices and Diagrams

Catalogs

- Technology Standards catalog
- Technology Portfolio catalog

Diagrams

- Environments and Locations diagram
- Platform Decomposition diagram

- Processing diagram
- Networked Computing/Hardware diagram
- Communications Engineering diagram

Matrices

- Application/Technology matrix

Migration Planning Techniques

The techniques used in Phases E and F for Migration Planning

Key areas including:

- Using the Implementation Factor Assessment and Deduction Matrix to document factors impacting the Architecture Implementation and Migration Plan.
- The purpose of the Consolidated Gaps, Solutions and Dependencies Matrix
- The purpose of an Architecture Definition Increments table
- Using the Enterprise Architecture State Evolution Table with the TRM
- Using the Business Value Assessment Technique
- Two matrices (the Implementation Factor Assessment and Deduction Matrix and the Consolidated Gaps, Solutions and Dependencies Matrix).
- Two tables (the Architecture Definition Increments table and the Enterprise Architecture State Evolution Table).
- One technique (the Business Value Assessment Technique)

Phase E: Opportunities and Solutions

Objectives

- Understand the objectives of Phase E, Opportunities and Solutions (the first phase directly concerned with implementation), what it consists of, what inputs are needed, and what the outputs are
- Generate the initial complete version of the Architecture Roadmap, based on the gap analysis and candidate Architecture Roadmap components from Phases B, C, and D
- Determine whether an incremental approach is required, and if so identify Transition Architectures that will deliver continuous business value

Approach

- This is the first phase concerning implementation.
- It takes into account the complete set of gaps between the Target and Baseline Architectures in all architecture domains.
- It logically groups changes into work packages.
- It builds a best-fit roadmap based on:
 - Stakeholder requirements
 - The enterprise's business transformation readiness
 - Identified opportunities and solutions
 - Identified implementation constraints

The following four concepts are key to transitioning from developing to delivering a Target Architecture:

- Architecture Roadmap
- Work Packages
- Transition Architectures
- Implementation and Migration Plan

Phase E: Opportunities & Solutions			
Objectives	Steps	Inputs	Outputs
<p>Generate the initial complete version of the Architecture Roadmap, based upon the gap analysis and candidate Architecture Roadmap components from Phases B, C, and D</p> <p>Determine whether an incremental approach is required, and if so identify Transition Architectures that will deliver continuous business value</p>	<p>Determine/confirm key corporate change attributes</p> <p>Determine business constraints for implementation</p> <p>Review and consolidate gap analysis results from Phases B to D</p> <p>Review consolidated requirements across related business functions</p> <p>Consolidate and reconcile interoperability requirements</p> <p>Refine and validate dependencies</p> <p>Confirm readiness and risk for business transformation</p> <p>Formulate Implementation and Migration Strategy</p> <p>Identify and group major work packages</p> <p>Identify Transition Architectures</p> <p>Create Architecture Roadmap & Implementation and Migration Plan</p>	<p>Product information</p> <p>Request for Architecture Work</p> <p>Capability Assessment</p> <p>Communications Plan</p> <p>Planning methodologies</p> <p>Governance models and frameworks</p> <p>Tailored Architecture Framework</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Draft Architecture Definition Document</p> <p>Draft Architecture Requirements Specification</p> <p>Change Requests for existing programs and projects</p> <p>Candidate Architecture Roadmap components from Phases B, C, and D</p>	<p>Statement of Architecture Work, updated if necessary</p> <p>Architecture Vision, updated if necessary</p> <p>Draft Architecture Definition Document, including:</p> <ul style="list-style-type: none"> • Transition Architecture, number and scope, if any <p>Draft Architecture Requirements Specification, updated if necessary</p> <p>Consolidated and validated Architecture Roadmap</p> <p>Capability Assessment, including:</p> <ul style="list-style-type: none"> • Business Capability • IT Capability <p>Architecture Roadmap, including:</p> <ul style="list-style-type: none"> • Work Package portfolio • Identification of Transition Architectures, if any • Impact analysis – project list • Implementation Recommendations <p>Implementation and Migration Plan (outline), including:</p> <ul style="list-style-type: none"> • Implementation and Migration Strategy

Phase F: Migration Planning

Objectives

- Finalize the Architecture Roadmap and the supporting Implementation and Migration Plan.
- Ensure that the Implementation and Migration Plan is coordinated with the enterprise's approach to managing and implementing change in the enterprise's overall change portfolio.
- Ensure that the business value and cost of work packages and Transition Architectures is understood by key stakeholders

Approach

- The focus is creation of the Implementation and Migration plan in co-operation with project and portfolio managers.
- Activities include the dependencies, costs, and benefits of the various migration projects within the context of the enterprise's other activity

Phase F: Migration Planning			
Objectives	Steps	Inputs	Outputs
<p>Finalize the Architecture Roadmap and the supporting Implementation and Migration Plan</p> <p>Ensure that the Implementation and Migration Plan is coordinated with the enterprise's approach to managing and implementing change in the enterprise's overall change portfolio</p> <p>Ensure that the business value and cost of work packages and Transition Architectures is understood by key stakeholders</p>	<p>Confirm management framework interactions for Implementation and Migration Plan</p> <p>Assign a business value to each work package</p> <p>Estimate resource requirements, project timings, and availability/delivery vehicle</p> <p>Prioritize the migration projects through the conduct of a cost/benefit assessment and risk validation</p> <p>Confirm Architecture Roadmap and update Architecture Definition Document</p> <p>Complete the Implementation Roadmap and Migration Plan</p> <p>Complete the development cycle and document lessons learned</p>	<p>Request for Architecture Work</p> <p>Communications Plan</p> <p>Organizational Model for Enterprise Architecture</p> <p>Governance models and frameworks</p> <p>Tailored Architecture Framework</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Draft Architecture Definition Document, including:</p> <ul style="list-style-type: none"> • Transition Architectures, if any <p>Draft Architecture Requirements Specification</p> <p>Change Requests for existing programs and projects</p> <p>Architecture Roadmap</p> <p>Capability Assessment, including:</p> <ul style="list-style-type: none"> • Business Capability • IT Capability <p>Implementation and Migration Plan (outline), including:</p> <ul style="list-style-type: none"> • High-level Implementation and Migration Strategy 	<p>Implementation and Migration Plan (detailed), including:</p> <ul style="list-style-type: none"> • Implementation and Migration Strategy • Project and portfolio breakdown of the implementation • Project charters (optional) <p>Finalized Architecture Definition Document, including:</p> <ul style="list-style-type: none"> • Finalized Transition Architectures, if any <p>Finalized Architecture Requirements Specification</p> <p>Finalized Architecture Roadmap</p> <p>Re-Usable Architecture Building Blocks</p> <p>Requests for Architecture Work for a new iteration of the ADM cycle (if any)</p> <p>Implementation Governance Model</p> <p>Change Requests for the Architecture Capability arising from lessons learned</p>

Phase G: Implementation Governance

Objectives

- Ensure conformance with the Target Architecture by implementation projects.
- Perform appropriate Architecture Governance functions for the solution and any implementation-driven architecture Change Requests

Approach

- Phase G relates the architecture to the implementation through the Architecture Contract.
- The information for successful management of the projects must be brought together.
- The development happens in parallel with Phase G
- Establish an implementation program that will enable the delivery of the Transition Architectures agreed on for implementation during the Migration Planning phase.
- Adopt a phased deployment schedule that reflects the business priorities embodied in the Architecture Roadmap.
- Follow the organization's standard for corporate, IT, and architecture governance.
- Use the organization's established portfolio/program management approach, where it exists.
- Define an operations framework to ensure the effective long life of the deployed solution
- Establish the connection between the architecture and implementation organization through the Architecture Contract.
- Develop project details, including:
 - Name, description, and objectives
 - Scope, deliverables, and constraints
 - Measures of effectiveness
 - Acceptance criteria
 - Risks and issues

Phase G: Implementation Governance			
Objectives	Steps	Inputs	Outputs
<p>Ensure conformance with the Target Architecture by implementation projects</p> <p>Perform appropriate Architecture Governance functions for the solution and any implementation-driven architecture Change Requests</p>	<p>Confirm scope and priorities for deployment with development management</p> <p>Identify deployment resources and skills</p> <p>Guide development of solutions deployment</p> <p>Perform enterprise architecture compliance reviews</p> <p>Implement business and IT operations</p> <p>Perform post-implementation review and close the implementation</p>	<p>Request for Architecture Work</p> <p>Capability Assessment</p> <p>Organizational Model for Enterprise Architecture</p> <p>Tailored Architecture Framework</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Architecture Definition Document</p> <p>Architecture Requirements Specification</p> <p>Architecture Roadmap</p> <p>Implementation Governance Model</p> <p>Architecture Contract</p> <p>Request for Architecture Work identified in Phases E and F</p> <p>Implementation and Migration Plan</p>	<p>Architecture Contract (signed)</p> <p>Compliance Assessments</p> <p>Change Requests</p> <p>Architecture-compliant solutions deployed, including:</p> <ul style="list-style-type: none"> * The architecture-compliant implemented system * Populated Architecture Repository * Architecture compliance recommendations and dispensations * Recommendations on service delivery requirements * Recommendations on performance metrics * Service Level Agreements (SLAs) * Architecture Vision, updated post-implementation * Architecture Definition Document, updated post-implementation * Business and IT operating models for the implemented solution

Phase H: Architecture Change Management

Phase H: Architecture Change Management			
Objectives	Steps	Inputs	Outputs
<p>Ensure that the architecture lifecycle is maintained</p> <p>Ensure that the Architecture Governance Framework is executed</p> <p>Ensure that the enterprise Architecture Capability meets current requirements</p>	<p>Establish value realization process</p> <p>Deploy monitoring tools</p> <p>Manage risks</p> <p>Provide analysis for architecture change management</p> <p>Develop change requirements to meet performance targets</p> <p>Manage governance process</p> <p>Activate the process to implement change</p>	<p>Request for Architecture Work</p> <p>Organizational Model for Enterprise Architecture</p> <p>Tailored Architecture Framework</p> <p>Statement of Architecture Work</p> <p>Architecture Vision</p> <p>Architecture Repository</p> <p>Architecture Definition Document</p> <p>Architecture Requirements Specification</p> <p>Architecture Roadmap</p> <p>Change Requests due to technology changes</p> <p>Change Requests due to business changes</p> <p>Change Requests from lessons learned</p> <p>Implementation Governance Model</p> <p>Architecture Contract (signed)</p> <p>Compliance Assessments</p> <p>Implementation and Migration Plan</p>	<p>Architecture updates</p> <p>Changes to architecture framework and principles</p> <p>New Request for Architecture Work, to initiate another cycle of the ADM</p> <p>Statement of Architecture Work, updated if necessary</p> <p>Architecture Contract, updated if necessary</p> <p>Compliance Assessments, updated if necessary</p>

ADM: Architecture Requirements Management

Requirements Management			
Objectives	Steps	Inputs	Outputs
<p>Ensure that the Requirements Management process is sustained and operates for all relevant ADM phases</p> <p>Manage architecture requirements identified during any execution of the ADM cycle or a phase</p> <p>Ensure that relevant architecture requirements are available for use by each phase as the phase is executed</p>	<p>Identify/document requirements</p> <p>Baseline requirements</p> <p>Monitor baseline requirements</p> <p>Identify changed requirement; remove, add, modify, and re-assess priorities</p> <p>Identify changed requirement and record priorities; identify and resolve conflicts; generate Requirements Impact Statements</p> <p>Assess impact of changed requirements on current and previous ADM phases</p> <p>Implement requirements arising from Phase H</p> <p>Update the requirements repository</p> <p>Implement change in the current phase</p> <p>Assess and revise gap analysis for past phases</p>	<p>The inputs to the Requirements Management process are the requirements-related outputs from each ADM phase.</p> <p>The first high-level requirements are produced as part of the Architecture Vision.</p> <p>Each architecture domain then generates detailed requirements. Deliverables in later ADM phases contain mappings to new types of requirements (for example, conformance requirements).</p>	<p>Changed requirements</p> <p>Requirements Impact Assessment, which identifies the phases of the ADM that need to be revisited to address any changes. The final version must include the full implications of the requirements (e.g., costs, timescales, and business metrics).</p>

Architecture Partitioning

- Architecture Partitioning can be used to manage complexity, parallel developments, conflicts and re-use.
- Classification criteria are defined for architectures and solutions.
- TOGAF provides guidance on how to use partitioning in the Preliminary Phase of the ADM cycle

Adapting the ADM: Iteration and Levels

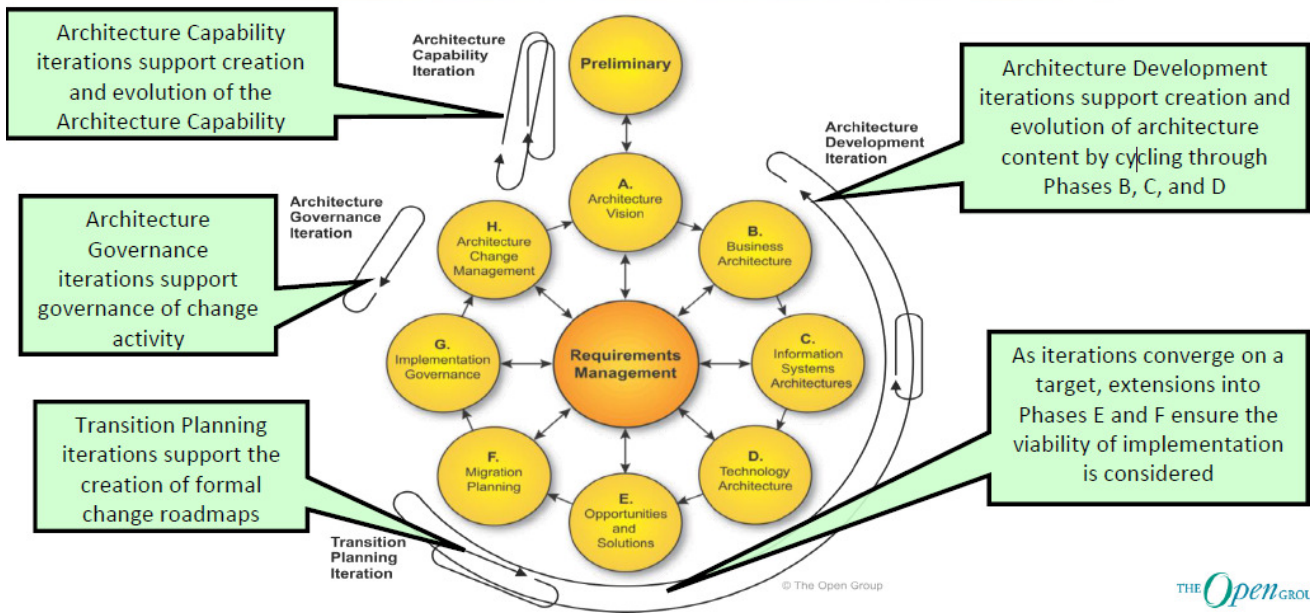
Iteration and the ADM

The ADM supports a number of concepts that can be characterized as Iteration, which describes:

- a comprehensive Architecture Landscape through multiple ADM cycles based on individual initiatives bound to the scope of the Request for Architecture Work;
- the integrated process of developing an architecture where the activities described in different ADM phases interact to produce an

- integrated architecture; and
- the process of managing change to the organization's Architecture Capability

Iteration Cycles



TOGAF defines three typical areas of engagement:

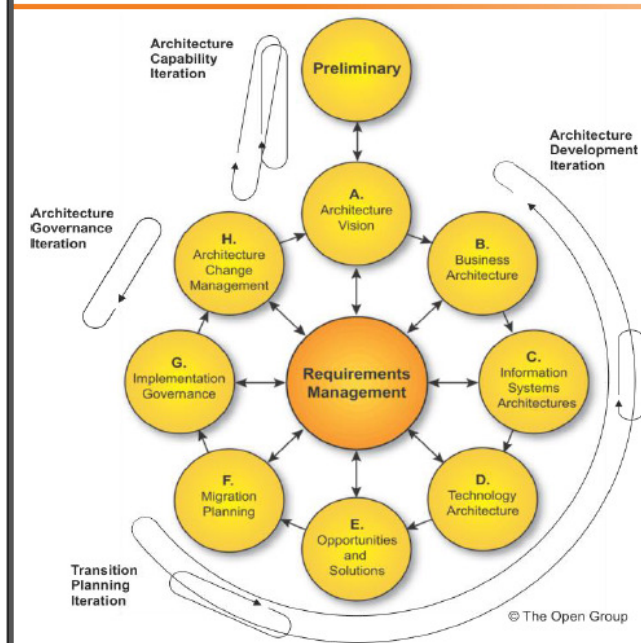
- Identification of Change Required
- Definition of Change
- Implementation of Change

Iteration Considerations

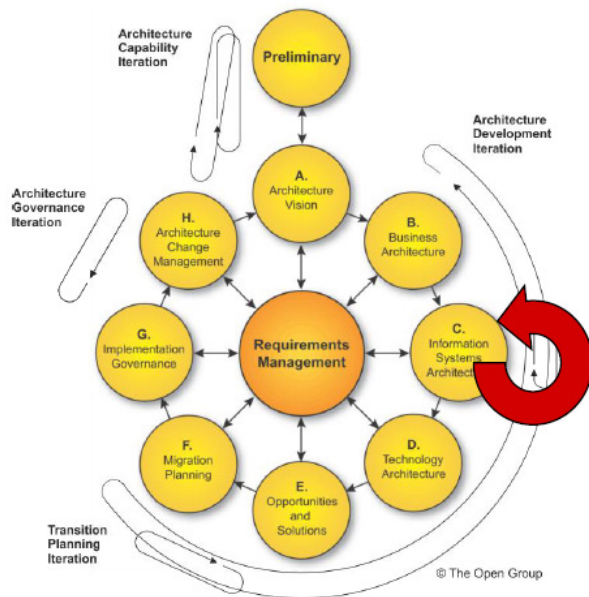
Iteration between ADM Cycles:

- They are suitable where a higher level architecture guides and constrains a detailed architecture.
- This approach uses the Migration Planning phase of one ADM cycle to initiate new projects which will also develop architectures.
- It is a method to develop a complete architecture landscape in multiple iterations

Architecture Development Iteration "Baseline First"

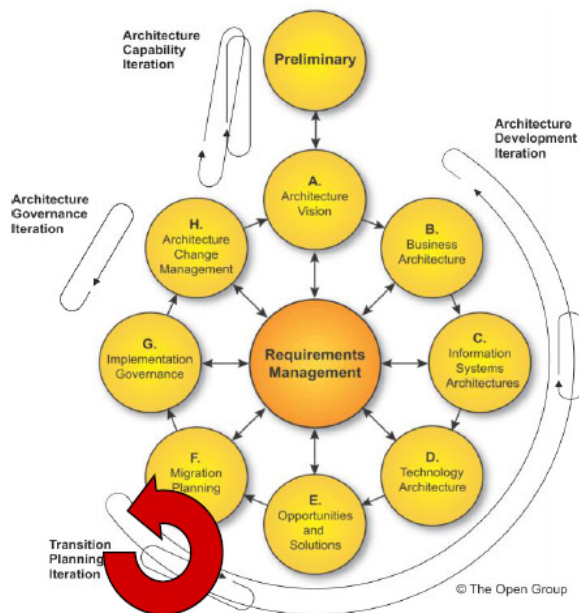


- Iteration 1 – Define the Baseline Architecture.
- Iteration 2 – Define the Target Architecture and gaps.
- Iteration n – Refine the Baseline Architecture, Target Architecture, and gaps.

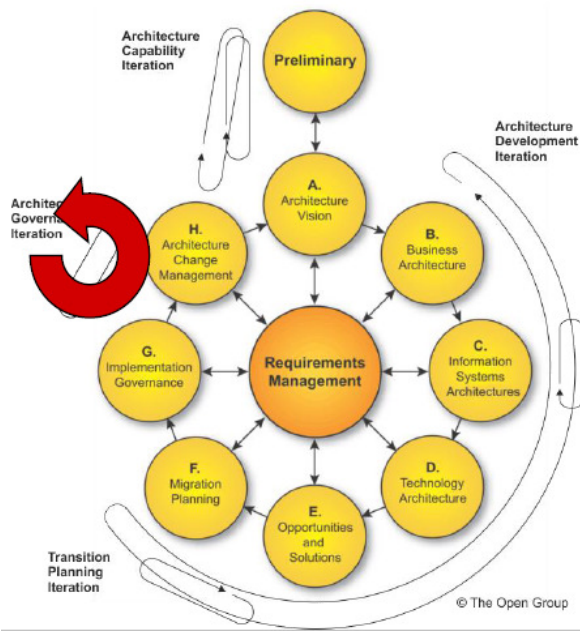


- Iteration 1 – Define the Target Architecture.
- Iteration 2 – Define the Baseline Architecture and gaps.
- Iteration n – Refine the Baseline architecture, Target Architecture, and gaps.

Transition Planning



- Iteration 1 - Define and agree a set of improvement opportunities, aligned against a provisional Transition Architecture.
- Iteration n – Agree the Transition Architecture, refining the identified improvement opportunities to fit.



- Iteration 1 – Mobilize architecture governance and change management processes.
- Iteration n – Carry out architecture governance and change control.

Adapting the ADM: Security

- TOGAF introduces guidance on Security and the ADM to help practitioners avoid missing a critical security concern.
- The guidance is not intended to be a security architecture development methodology.
- It is intended to inform the enterprise architect of the security architecture task and role

Adapting the ADM: SOA

How EA supports SOA

Enterprise architecture supports SOA by providing frameworks, tools, and techniques. Key benefits provided by using EA for SOAs include:

- Consistent abstractions of strategies and deliverables to support planning and analysis
- The ability to link different perspectives to a single business problem providing a consistent model to address various domains and tests for completeness
- Identification of clear roadmaps to achieve future state
- Traceability that links IT and other assets to the business they support
- Support for impact assessment, risk/value analysis, and portfolio management
- Identified and documented principles, constraints, frameworks, patterns, and standards
- Governance frameworks and process that ensure the appropriate authority for decision-making

Objectives:

- Ensure SOA supporting Principles are in place
- Ensure SOA Governance is in place



Inputs	Steps	Outputs
<ul style="list-style-type: none"> • Existing SOA Reference Architectures • Existing industry SOA Maturity models • Existing SOA Governance Frameworks • Existing Industry best practice SOA principles 	<ul style="list-style-type: none"> • Identify and establish Principles <ul style="list-style-type: none"> ◦ SOA supporting Principles • Confirm governance <ul style="list-style-type: none"> ◦ Refer to The Open Group SOA Governance Framework, and specifically the SOA Governance Vitality Method (SGVM) • Evaluate SOA Maturity <ul style="list-style-type: none"> ◦ Use The Open Group Service Integration Maturity Model (OSIMM) • Define and establish architecture organization <ul style="list-style-type: none"> ◦ Establish an SOA Centre of Excellence 	<ul style="list-style-type: none"> • SOA Maturity Assessment • Architecture principles <ul style="list-style-type: none"> ◦ including SOA principles • Architecture Governance Framework <ul style="list-style-type: none"> ◦ The Open Group SOA Governance Framework

Phase A Enhancements

Objectives

- No additional objective material

Inputs	Steps	Outputs
<ul style="list-style-type: none"> • Organizational Model <ul style="list-style-type: none"> ◦ SOA Centre of Excellence ◦ SOA Maturity Assessment ◦ SOA Readiness Assessment ◦ SOA Governance • Tailored Architecture Framework <ul style="list-style-type: none"> ◦ SOA meta-model extensions ◦ SAO Reference Architecture • Available higher-level (Strategic/ Segment) architecture 	<ul style="list-style-type: none"> • Identify stakeholder concerns <ul style="list-style-type: none"> ◦ SOA specific concerns • Define scope <ul style="list-style-type: none"> ◦ Ensure scope is appropriate for SOA ◦ Tailor deliverables to level of architecture • Evaluate Business Capabilities <ul style="list-style-type: none"> ◦ SOA readiness • Confirm Principles <ul style="list-style-type: none"> ◦ SOA supporting Principles 	<ul style="list-style-type: none"> • Statement of Architecture Work <ul style="list-style-type: none"> ◦ with SOA as an approach • Architecture principles <ul style="list-style-type: none"> ◦ including SOA principles • Capability assessment <ul style="list-style-type: none"> ◦ including SOA readiness • Architecture Vision <ul style="list-style-type: none"> ◦ with SOA thinking • Additional content populating the Architecture Repository <ul style="list-style-type: none"> ◦ including SOA Reference Architecture



Objectives – No additional objective

Inputs	Steps	Outputs
<ul style="list-style-type: none"> Organizational Model <ul style="list-style-type: none"> SOA Centre of Excellence SOA Maturity Assessment SOA Readiness Assessment SOA Governance Tailored Architecture Framework <ul style="list-style-type: none"> SOA meta-model extensions SOA Reference Architecture Available higher-level (Strategic/ Segment) architecture 	<ul style="list-style-type: none"> Select Reference models, viewpoints & tools <ul style="list-style-type: none"> SOA meta-model & content extensions Information Entity and Information Component 	<ul style="list-style-type: none"> Validated business Principles <ul style="list-style-type: none"> SOA supporting Principles Target Business Architecture <ul style="list-style-type: none"> Business Service (with contract) Business Process Information Entity Information Component Draft Architecture Requirements <ul style="list-style-type: none"> Technical requirements for SOA Outputs may include <ul style="list-style-type: none"> Business Service Interaction Diagram Business Process Diagram Business Vocabulary Catalog Business Services Catalog Business Service/Location catalog Event/Process catalog Contract/Service Quality Catalog Business Service Interaction Matrix Business Service/Information matrix Information component model

Phase C Enhancements

Objectives

- Extend Applications section to include 'Applications and Services.

Inputs	Steps	Outputs
<ul style="list-style-type: none"> Organizational Model <ul style="list-style-type: none"> SOA Centre of Excellence SOA Maturity Assessment SOA Readiness Assessment SOA Governance Tailored Architecture Framework <ul style="list-style-type: none"> SOA meta-model extensions SOA Reference Architecture Available higher-level (Strategic/ Segment) architecture 	<ul style="list-style-type: none"> Select Reference models, viewpoints and tools SOA meta-model and content extensions IS Service Contract Relationship between IS Service and Data Entity 	<ul style="list-style-type: none"> Validated business Principles <ul style="list-style-type: none"> SOA supporting Principles Target Information Systems Architecture <ul style="list-style-type: none"> IS Service (with contract) Service Portfolio Draft Architecture Requirements <ul style="list-style-type: none"> Technical requirements for SOA Outputs may include: <ul style="list-style-type: none"> Service Interaction Diagram Business Process/Service Matrix Service Contract Catalog IS Service/Application (existing) catalog IS Service/Data entity matrix Logical SOA Component Matrix Logical SOA Solution Diagram Service Distribution Matrix

Phase D Enhancements

Objectives – No additional objective material

Inputs	Steps	Outputs
<ul style="list-style-type: none">Organizational Model<ul style="list-style-type: none">SOA Centre of ExcellenceSOA Maturity AssessmentSOA Readiness AssessmentSOA GovernanceTailored Architecture Framework<ul style="list-style-type: none">SOA meta-model extensionsSAO Reference ArchitectureAvailable higher-level (Strategic/ Segment) architecture	<ul style="list-style-type: none">Select Reference models, viewpoints & tools<ul style="list-style-type: none">SOI Reference ModelRelationship between Logical Technology Component & Logical Application Component	<ul style="list-style-type: none">Validated business Principles<ul style="list-style-type: none">SOA supporting PrinciplesTarget Technology Architecture<ul style="list-style-type: none">Expected processing load and distribution of load across technologyDraft Architecture Requirements<ul style="list-style-type: none">Technical requirements for SOAOutputs may include<ul style="list-style-type: none">Logical Technology Architecture DiagramLogical Application and Technology Matrix

Phase E Enhancements

sim

Objectives – No additional objective material

Inputs	Steps	Outputs
<ul style="list-style-type: none">Organizational Model<ul style="list-style-type: none">SOA Centre of ExcellenceSOA Maturity AssessmentSOA Readiness AssessmentSOA GovernanceTailored Architecture Framework<ul style="list-style-type: none">SOA meta-model extensionsSOA Reference ArchitectureAvailable higher-level (Strategic/ Segment) architecture	<ul style="list-style-type: none">Select Reference models, viewpoints & tools<ul style="list-style-type: none">Physical Data ComponentPhysical Application ComponentTechnology Application ComponentSOA Solution	<ul style="list-style-type: none">Architecture Roadmap<ul style="list-style-type: none">SOA and SOI RoadmapDraft Architecture Requirements<ul style="list-style-type: none">Technical requirements for SOAOutputs may include<ul style="list-style-type: none">Physical SOA Solution MatrixPhysical SOA Solution DiagramPhysical Service Solution MatrixApplication GuidelinesPhysical Technology Architecture diagramPhysical Application and Technology MatrixTechnology Portfolio CatalogTechnology Guidelines

Summary

- The use of SOA as an architectural style is intended to simplify business.
- Concepts from the TOGAF content metamodel relate directly to SOA.
- Enterprise architecture can be used to support SOA by providing a set of tools and techniques to address many of the non-technical challenges associated with SOA adoption.
- TOGAF provides guidance and a set of resources for adapting the ADM for SOA development.
- The Open Group SOA Work Group has a number of other documents that support SOA development

Architecture Maturity Tools

ACMM Enterprise Architecture Elements

1. Architecture process:

- Is there an established Enterprise Architecture process?
- 2. Architecture development:
 - To what extent is the development and progression of the Operating Units' Enterprise Architecture documented?
- 3. Business linkage:
 - To what extent is the Enterprise Architecture linked to business strategies or drivers?
- 4. Senior management involvement:
 - To what extent are the senior managers of the Operating Unit involved in the establishment and ongoing development of an IT Architecture?
- 5. Operating unit participation
 - To what extent is the Enterprise Architecture process accepted by the Operating Unit?
 - To what extent is the Enterprise Architecture process an effort representative of the whole organization?
- 6. Architecture communication
 - To what extent are the decisions of Enterprise Architecture practice documented?
 - To what extent is the content of the Enterprise Architecture made available electronically to everybody in the organization?
 - To what extent is architecture education done across the business on the Enterprise Architecture process and contents?
- 7. IT security
 - To what extent is IT Security integrated with the Enterprise Architecture?
- 8. Architecture governance
 - To what extent is an Enterprise Architecture governance (governing body) process in place and accepted by senior management ?
- 9. IT investment and acquisition strategy
 - To what extent does the Enterprise Architecture influence the IT Investment and Acquisition Strategy?

TOGAF Standard 9.2

What are the benefits of an Enterprise Architecture?

An effective Enterprise Architecture can bring important benefits to the organization. Specific benefits of an Enterprise Architecture include:

- More effective and efficient business operations:
 - Lower business operation costs
 - More agile organization
 - Business capabilities shared across the organization
 - Lower change management costs
 - More flexible workforce
 - Improved business productivity
- More effective and efficient Digital Transformation and IT operations:
 - Extending effective reach of the enterprise through digital capability
 - Bringing all components of the enterprise into a harmonized environment
 - Lower software development, support, and maintenance costs
 - Increased portability of applications
 - Improved interoperability and easier system and network management
 - Improved ability to address critical enterprise-wide issues like security
 - Easier upgrade and exchange of system components
- Better return on existing investment, reduced risk for future investment:
 - Reduced complexity in the business and IT
 - Maximum return on investment in existing business and IT infrastructure
 - The flexibility to make, buy, or out-source business and IT solutions
 - Reduced risk overall in new investments and their cost of ownership
- Faster, simpler, and cheaper procurement:
 - Buying decisions are simpler, because the information governing procurement is readily available in a coherent plan
 - The procurement process is faster — maximizing procurement speed and flexibility without sacrificing architectural coherence

The Meaning of Architecture Compliance

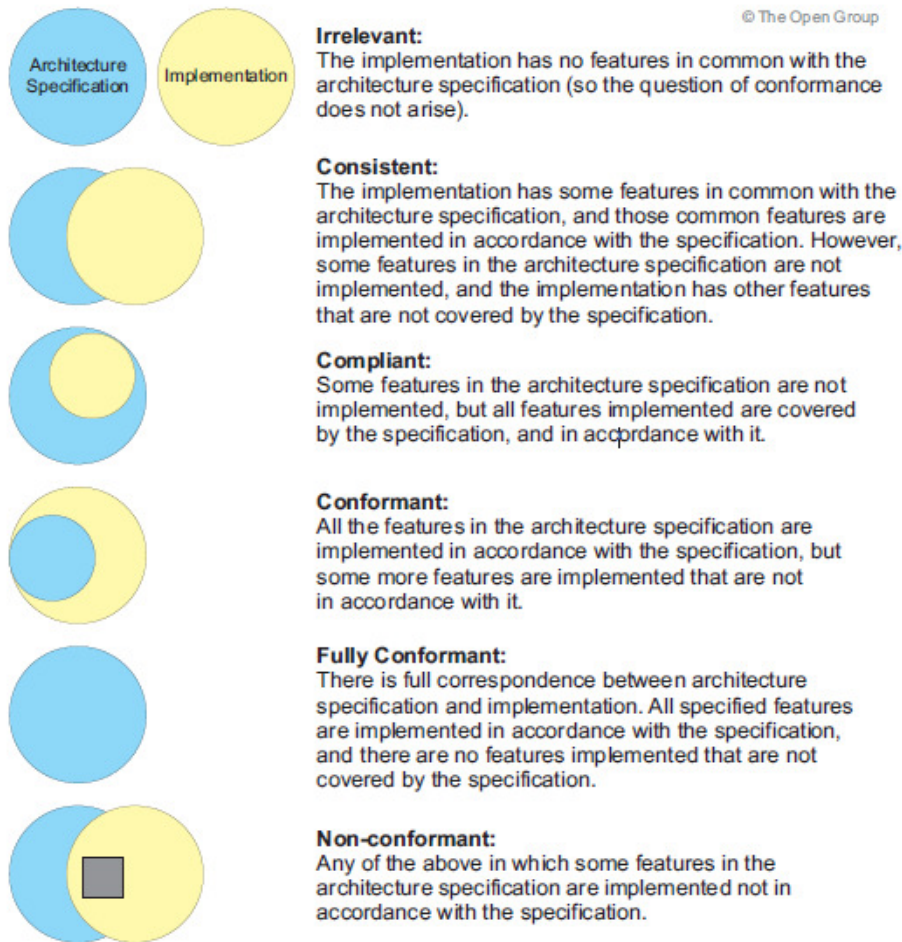


Figure 42-1 Levels of Architecture Conformance

<http://www.techbolo.com/questions/index.php/416768/lang-en>

<https://www.test-questions.com/togaf-exam-questions-04.php>

<http://theopenarch.com/81-tests/72-togaf-9-exam-tests.html>

<https://pubs.opengroup.org/architecture/togaf9-doc/arch/index.html>

Part I - Introduction

Part II - ADM

Part III - ADM Guidelines and Techniques

Part IV - Architecture Content Framework

Part V - Enterprise Continuum and Tools

Part VI - Architecture Capability Framework

Good set of **Architecture Principles** follows the basic criteria: **Understandability, Robustness, Completion, Consistency and Stability (URCCS)**

Iteration Cycles: **Architecture Capability** in Preliminary Phase, **Architecture Development** in Phase B to F, **Transition Planning** in Phases E-F and **Architecture Governance** in Phases G-H

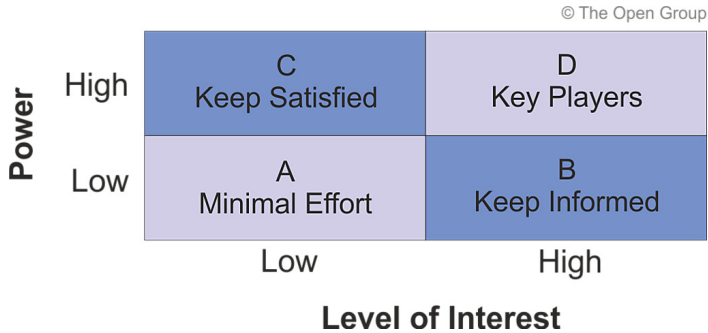
Organizing the Architecture Landscape to Understand the State of the Enterprise

The following characteristics are typically used to organize the Architecture Landscape:

- **Breadth:** the breadth (subject matter) area is generally the primary organizing characteristic for describing an Architecture Landscape. Architectures are functionally decomposed into a hierarchy of specific subject areas or segments.
- **Depth:** with broader subject areas, less detail is needed to ensure that the architecture has a manageable size and complexity. More specific subject matter areas will generally permit (and require) more detailed architectures.

- **Time:** for a specific breadth and depth an enterprise can create a Baseline Architecture and a set of Target Architectures that stretch into the future. Broader and less detailed architectures will generally be valid for longer periods of time and can provide a vision for the enterprise that stretches further into the future.
- **Recency:** finally, each architecture view will progress through a development cycle where it increases in accuracy until finally approved. After approval, an architecture will begin to decrease in accuracy if not actively maintained. In some cases recency may be used as an organizing factor for historic architectures.

Stakeholders Management Approach



Risk Management

There are two levels of risk that should be considered, namely:

1. **Initial Level of Risk:** risk categorization prior to determining and implementing mitigating actions
2. **Residual Level of Risk:** risk categorization after implementation of mitigating actions (if any)

The process for risk management is described in the following sections and consists of the following activities:

- Risk classification
- Risk identification
- Initial risk assessment
- Risk mitigation and residual risk assessment
- Risk monitoring

Corporate Risk Impact Assessment					
Effect	Frequency				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

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