Whole Enterprise Architecture Framework (WEAF): Detailed Summary

- Overview
- Construction
- Usage

- Enterprise Dimensions
  - Business Functions
  - System Components
  - Service Lifecycle
- Enterprise Model

- Assurance Viewpoints
  - Function Governance
  - System Management
  - Service Realization
- Assurance Ecosystem

- Requirement Specification
  - Template
  - Methodology

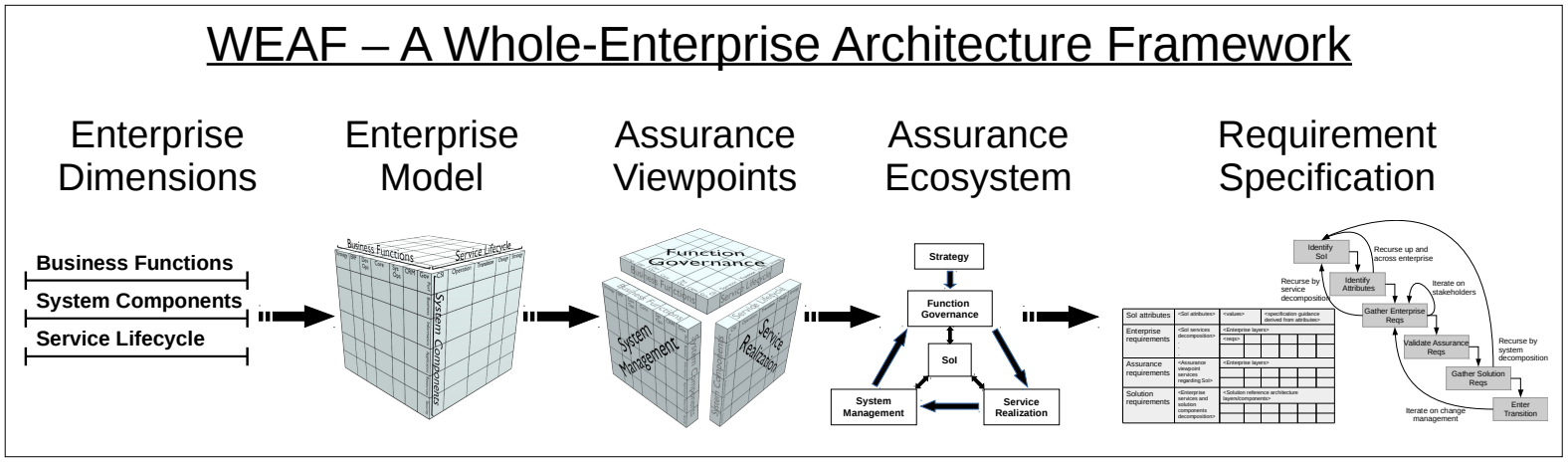
WEAF Overview

The Challenge

- **An enterprise is a complex network of people, processes, and resources that change continuously.**
- No standard for a unified model of the whole enterprise.
- Business assurance is a key concern for realizing business outcomes.
- **Coverage and traceability of requirements are major challenges for business assurance**.
- No standard for an assurance ecosystem that covers assurance across an enterprise and supports traceability.
- **Enforcing coverage and traceability is problematic without a common model of the enterprise.**

An Answer

- WEAF is proposed as a framework providing a unified enterprise model and an assurance ecosystem while enforcing coverage and traceability through structured requirement specification.
- Enterprise dimensions are defined to provide coverage and standards alignment.
- **An enterprise model is constructed to represent all business entities throughout the lifecycle**.
- Representation viewpoints are derived via projections and restrictions of the dimensions.
- Canonical assurance viewpoints are defined for the model and used together with strategy to build **an assurance ecosystem covering all assurance concerns**.
- Requirement specification template and methodology to capture SoI attributes and requirements, **enforce coverage of strategic and stakeholder concerns**, and **enable ubiquitous traceability**.



WEAF Construction

1) Define Enterprise Dimensions and Align Standards

Business process frameworks

Business Functions (service or role)

Strategy | ERP | DevOps | Core | SysOps | CRM | Gov

Reference architectures

System Components (enterprise or solution)

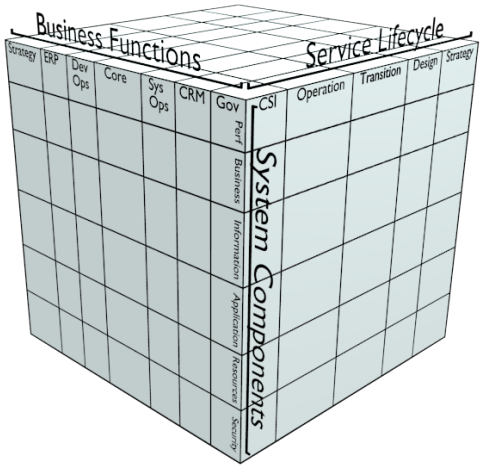
Performance | Business | Information | Application | Resources | Security

Lifecycle methodologies

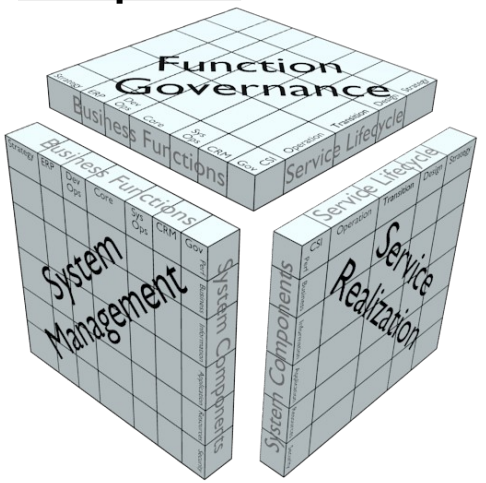
Service Lifecycle (organization or life history)

Strategy | Design | Transition | Operation | CSI

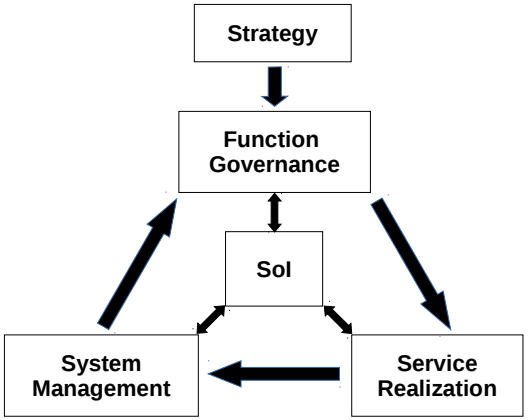
2) Assemble Enterprise Model



3) Derive Assurance Viewpoints



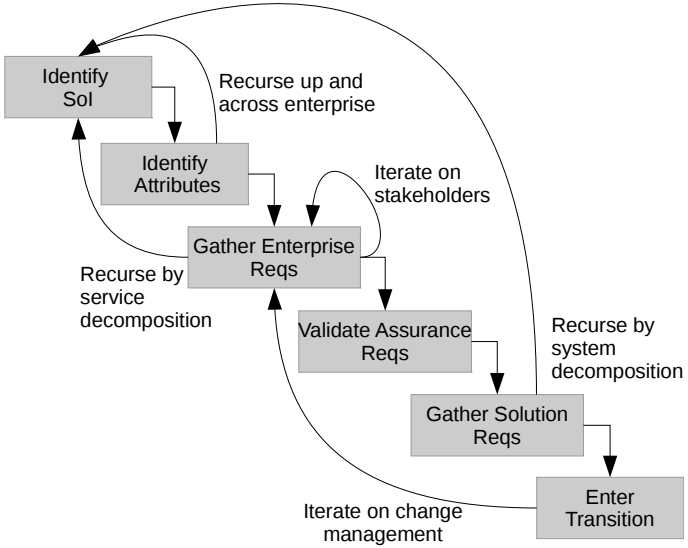
4) Construct Assurance Ecosystem



5) Create Requirement Specification Template

SoI attributes	<SoI attributes>	<values>		<specification guidance derived from attributes>			
Enterprise requirements	<SoI services decomposition> . . .	<Enterprise layers>					
		<reqs>					
Assurance requirements	<Assurance viewpoint services regarding SoI>	<Enterprise layers>					
Solution requirements	<Enterprise services and solution components decomposition>	<Solution reference architecture layers/components>					

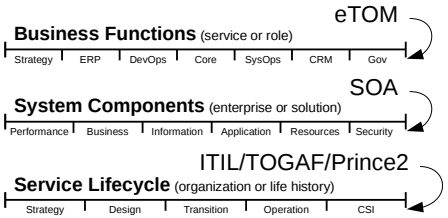
6) Create Requirement Specification Methodology

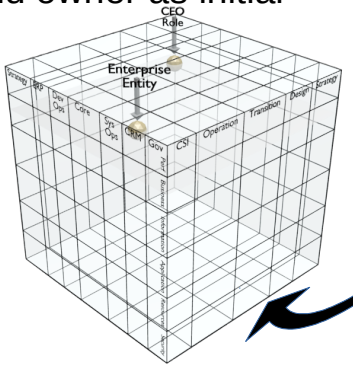


WEAF Usage

1) Initialize the model

- Select and align standards
- Define the enterprise and owner as initial entities of interest (SoI)



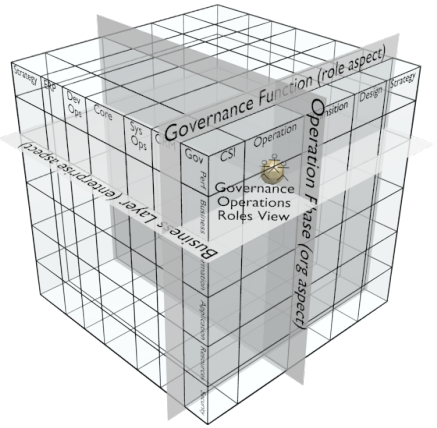


2) Populate the model

- Identify SoI
- Specify attributes
  - Position SoI in model
  - Establish trace links
- Specify requirements
  - Iterate on stakeholders and change management
  - Recurse on decomposition
- Update with instance details

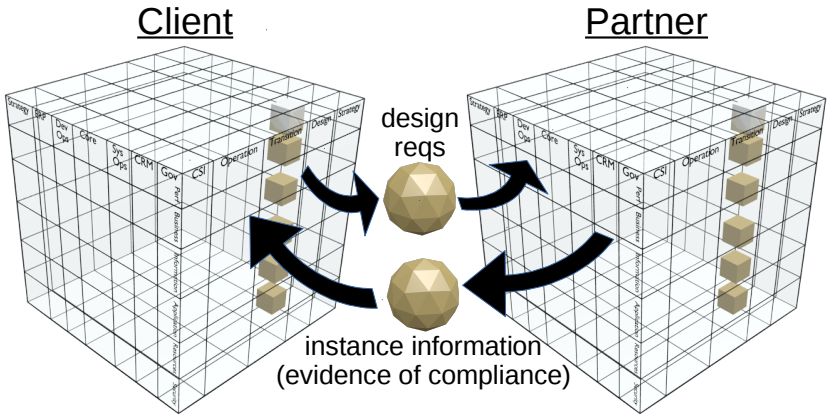
3) Generate Views

- Select viewpoints by projections and restrictions on dimensions



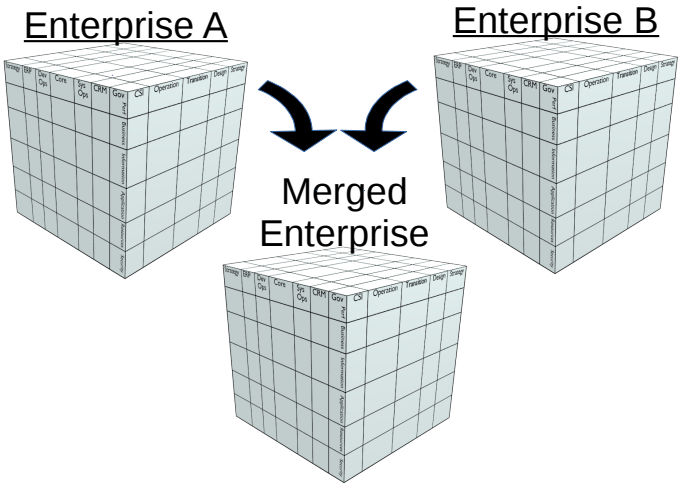
4) Exchange requirements

- Client defines and exports SoI enterprise requirements for partner
  - Attributes referencing alignment-level dimension elements
  - Applicable requirements, standards, design guidance, and success criteria
- Partner exports SoI instance information for client model update and proof of compliance



5) Merge/reconcile models

- Export participant models
- Import to merged model
- Analyse and reconcile redundancies



WEAF Dimensions

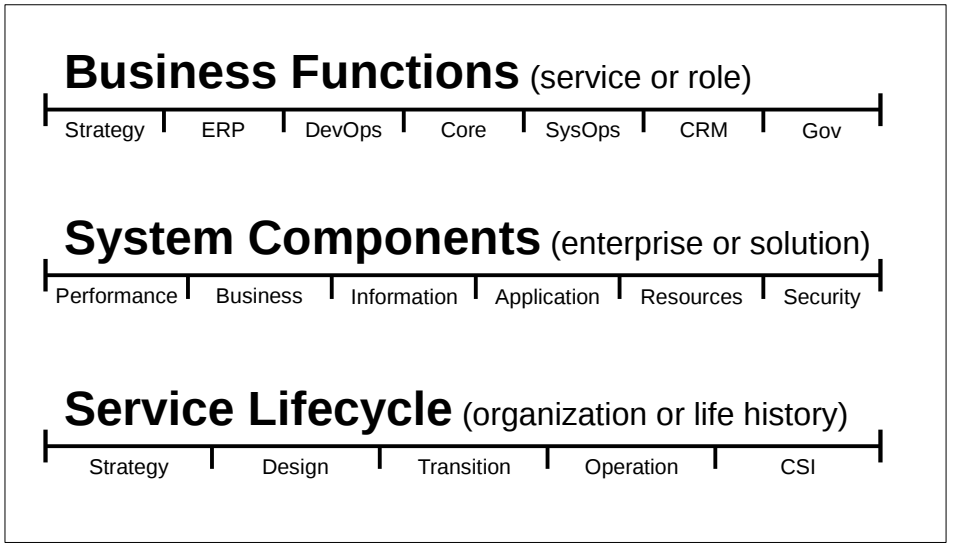
Interpretation:

- Characterization of business entities throughout their life history using aspects of “people, process, technology” and lifecycle.
- Common basis for standards alignment.

Alignment of standards:

- Business process frameworks
- Reference architectures
- Lifecycle methodologies

Enterprise dimensions (and aspects)



Utility of aspects:

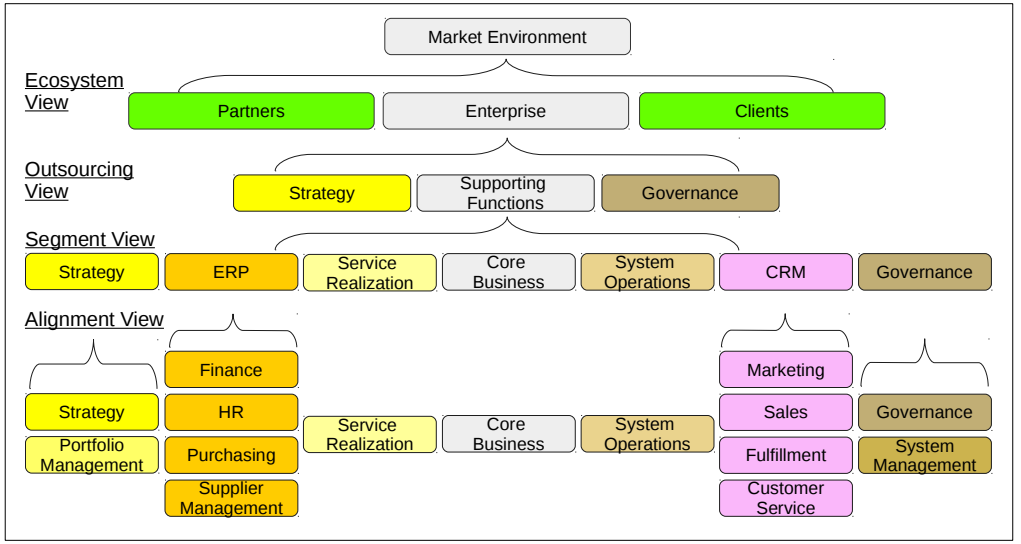
- Separation of processes grouping by service and role
- Separation of enterprise system and technical solution
- Separation of lifecycle support and lifecycle maturity

WEAF Dimension - Business Functions

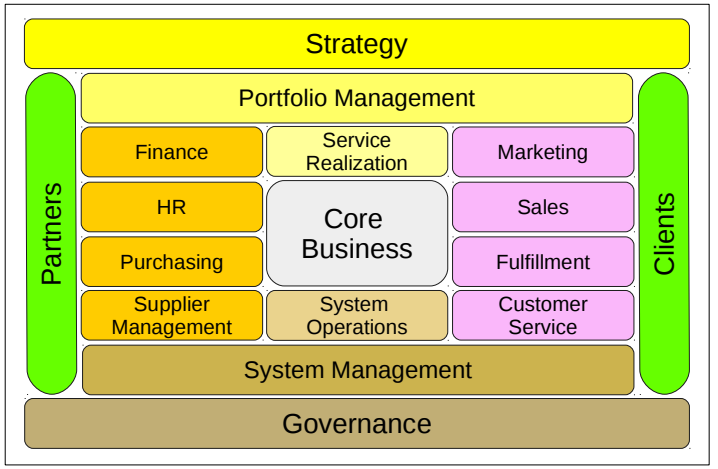
Interpretation:

- Characterization of business processes grouped by organizational structure, role, and service.

Business Function Hierarchy



Business Function Model



Standards mapping:

Business process frameworks -

- APQC PCF
- eTOM
- SCOR
- ARTS
- ...

Aspects:

- Role – processes grouped to assign responsibility
- Service – processes grouped to specify an outcome

WEAF Dimension – System Components

Interpretation:

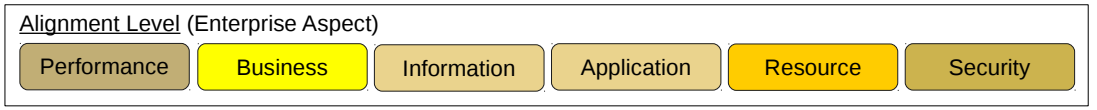
- Characterization of enterprise systems as components grouped into logical layers.
- In contrast to the other dimensions, the representation differs between aspects. This reflects transition from high-level design to detailed design.
- The enterprise aspect representation is the alignment view. The solution aspect must be aligned to maintain traceability.
- The solution aspect dimension elements vary based on chosen solution RA.

Standards mapping:

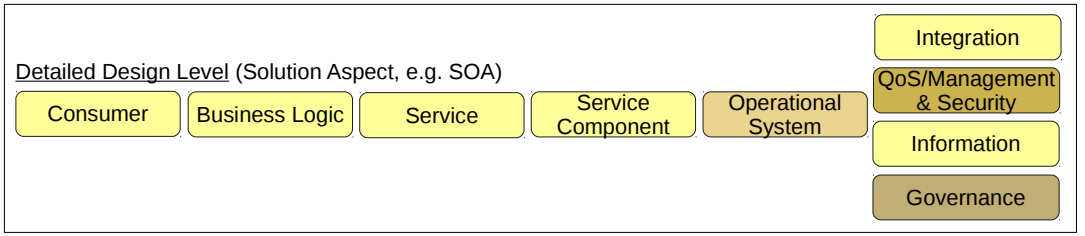
Reference architectures (RA):

- FEAF RAs
- TOGAF RAs
- DoD IEA RAs
- ...
- SOA
- ODP
- TOGAF TRM and III-RM
- ...

System Components Dimension - Enterprise Aspect



System Components Dimension - Solution Aspect



Aspects:

- Enterprise – enterprise decomposition
- Solution – technical decomposition

WEAF Dimension – Service Lifecycle

Interpretation:

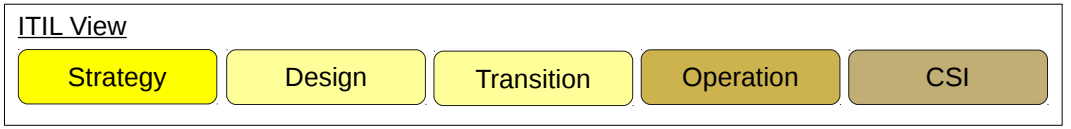
- Characterization of lifecycle phases following ITIL.
- Aspects characterize SoI by organizational support of phase OR phase of life history.
- Detailed views are a tentative decomposition to reflect DevOps practice.

Standards mapping:

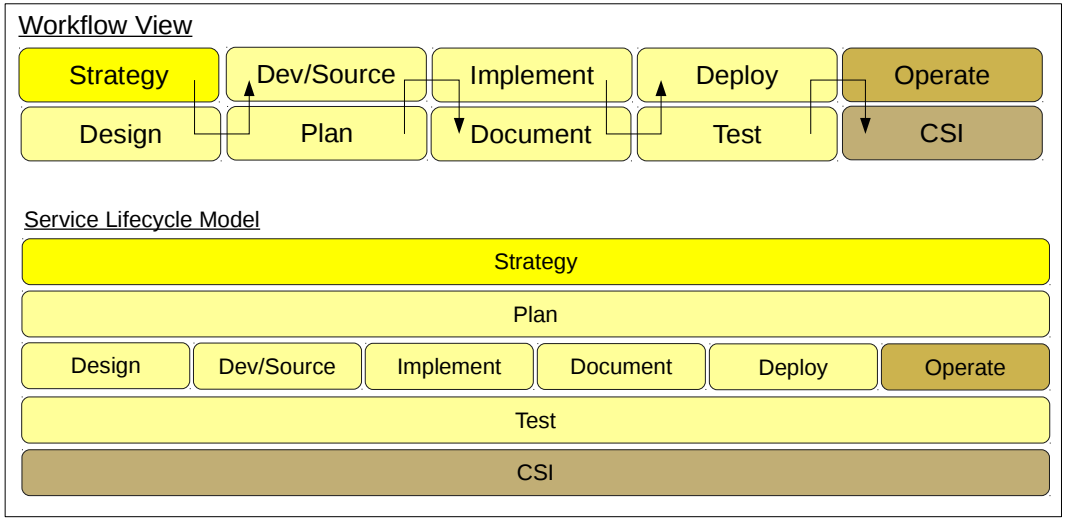
Lifecycle methodologies -

- ITIL
- TOGAF ADM
- PRINCE2
- PMBOK
- ...

Service Lifecycle Dimension – Alignment View



Service Lifecycle Dimension – Detailed Views



Aspects:

- static – organization view of SoI in terms of lifecycle phase(s) supported
- dynamic - life history view of SoI maturity in terms of lifecycle phase

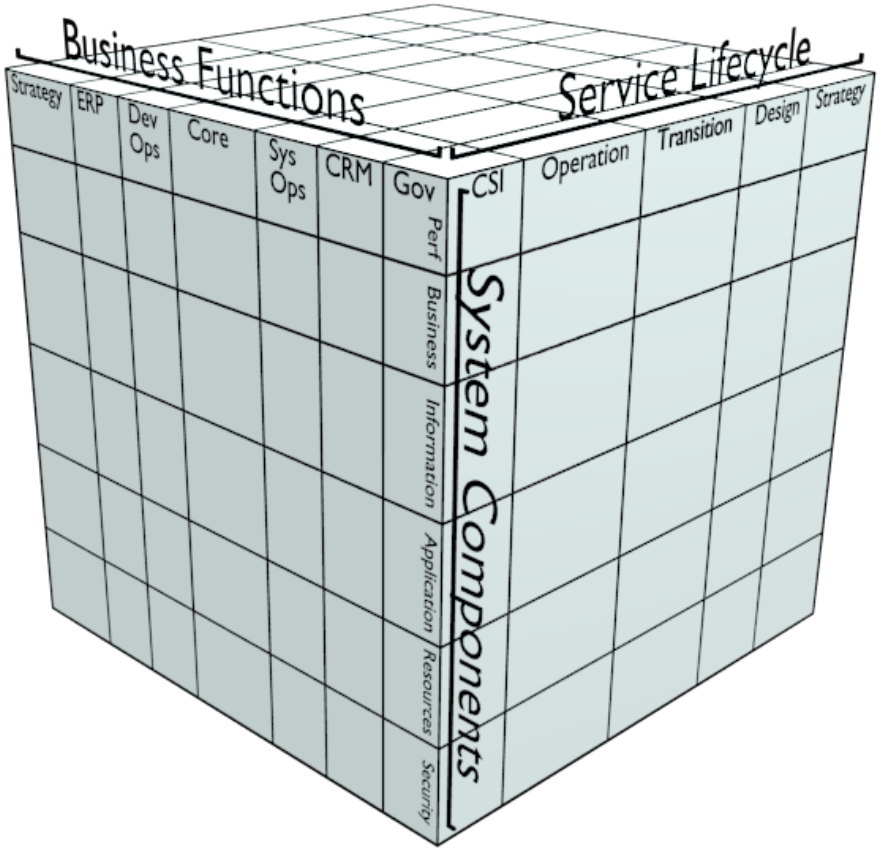
WEAF Enterprise Model

Interpretation:

- Representation of an enterprise and business entities (SoI).
- Characterization of SoI people and processes by the business functions dimension and aspects.
- Characterization of SoI systems, solutions, technology, and resources by the system components dimension and aspects.
- Characterization of SoI lifecycle support and state by the service lifecycle dimension and aspects.

Populate:

- Position SoI in model
- Establish trace links up and across enterprise
- Decompose SoI to establish trace links and design requirements for deployed instance components
- Design guided by linked standards and principles



Extract:

- Derive viewpoints via dimension projections and restrictions
- Generate SoI views
- Perform gap, redundancy, and compliance analysis
- Exchange SoI information and requirements

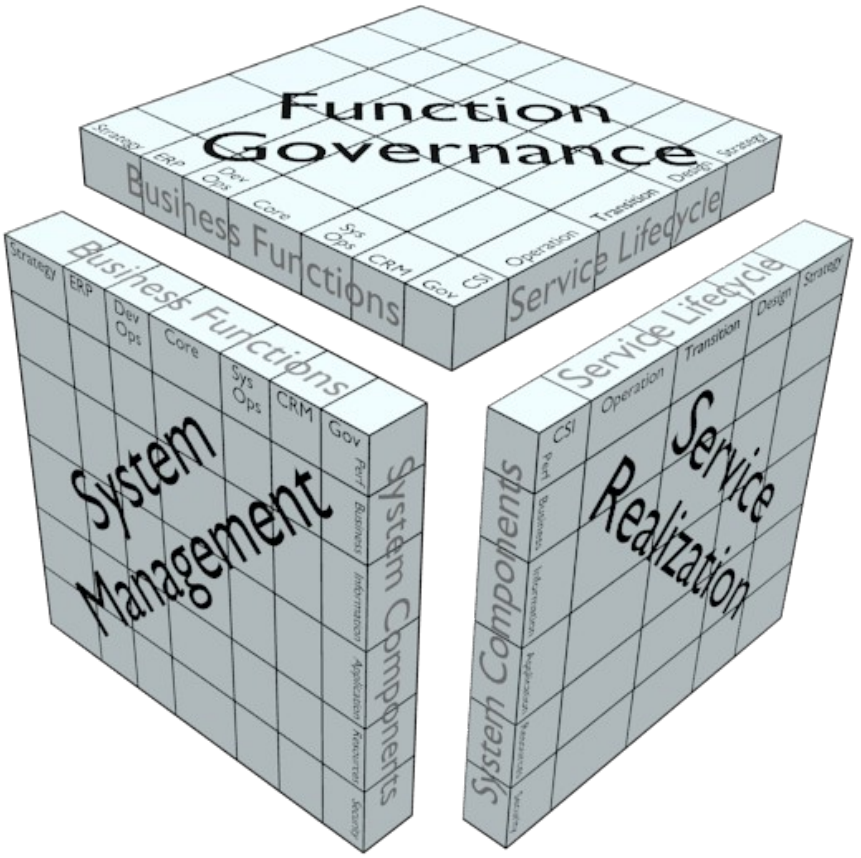
WEAF Assurance Viewpoints

Interpretation:

- Representation of assurance concerns covering the enterprise.
- Each assurance viewpoint has a corresponding business function.
- Corresponding business function services define categories of assurance requirements.
- Dimension aspects define sub-viewpoints for each assurance viewpoint

Assurance Concerns:

- Coverage - across business functions, between strategy and instances, throughout the lifecycle
- Traceability- links up to strategy, across to indirect dependencies, and down to instance components



Assurance Cases:

- Claim – compliance with assurance service requirements
- Argument – fulfillment of assurance service criteria
- Evidence – generated views with criteria values

WEAF Viewpoint – Function Governance

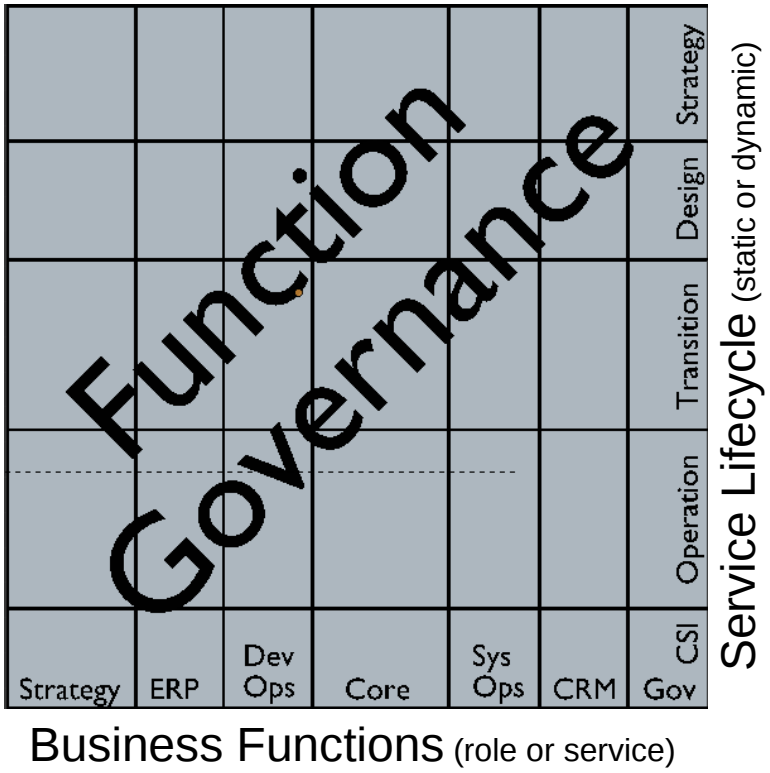
Interpretation:

- Assurance viewpoint for business operation and business change
- Lifecycle static/organization aspect defines an audit sub-viewpoint
- Lifecycle dynamic/life history aspect define a change management sub-viewpoint

Corresponding business function and services:

<u>Governance</u>

- Compliance
- Dispensation
- Communication



Sub-viewpoints by aspect* and categorized:

<u>Audit Viewpoint</u>

- As-is role
- As-is service

<u>Change Management Viewpoint</u>

- Role change
- Service change

* lifecycle aspect naming:

- static = as-is
- dynamic = change

WEAF Viewpoint – System Management

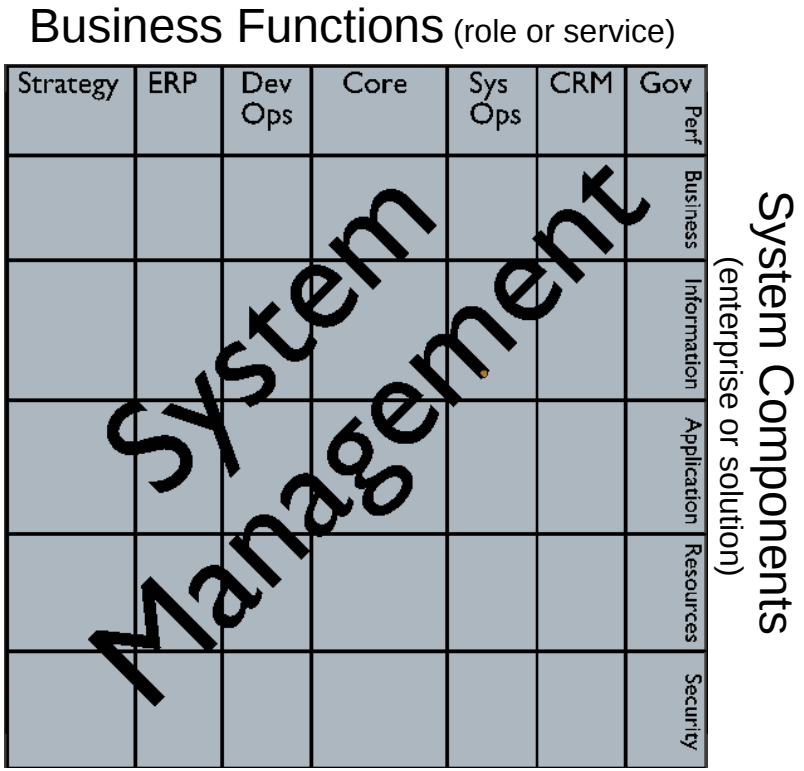
Interpretation:

- Assurance viewpoint for enterprise and technical systems supporting business functions
- System component enterprise aspect defines an organization management sub-viewpoint
- System component solution aspect defines a technical management sub-viewpoint

Corresponding business function and services*:

<u>System Management</u>

- Fault monitoring
- Configuration management
- Usage accounting
- Performance
- Security
- Continuity
- Request fulfillment/change control



Sub-viewpoints by aspect and categorized:

<u>Org Mgmt Viewpoint</u>

- Enterprise role
- Enterprise service

<u>Tech Mgmt Viewpoint</u>

- Solution role
- Solution service

* System management services are a tentative merger of ISO-7498 FCAPS, eTOM FAB, and continuity.

WEAF Viewpoint – Service Realization

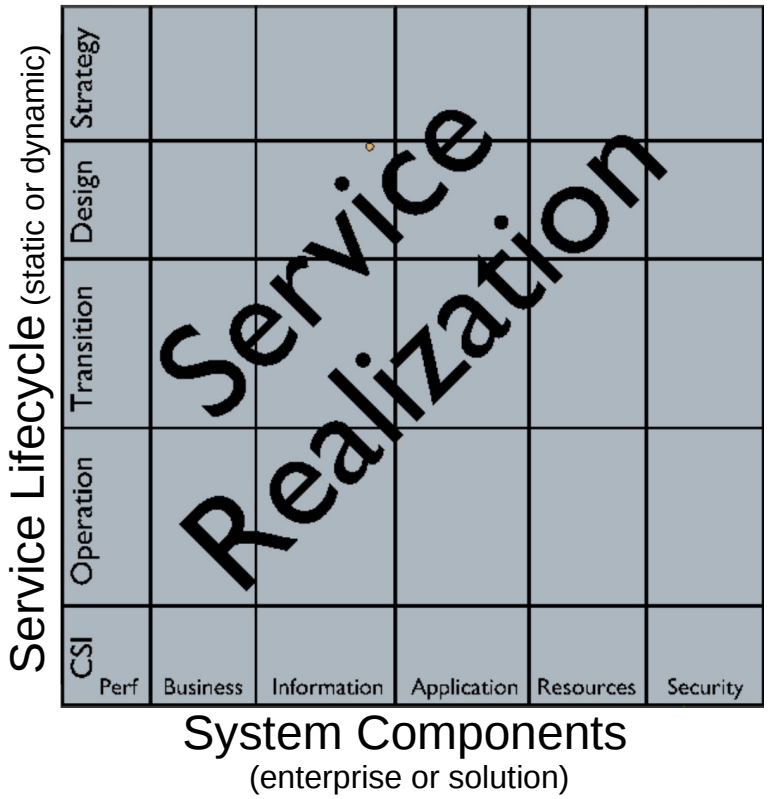
Interpretation:

- Assurance viewpoint for enterprise and solution system change through the lifecycle.
- Lifecycle static/organization aspect defines a baseline sub-viewpoint.
- Lifecycle dynamic/life history aspect defines a project management sub-viewpoint.

Corresponding business function and services[†]:

Service Realization

- Design
- Plan
- Develop/Source
- Implement/integrate
- Document
- Test
- Deploy



Sub-viewpoints by aspect[*] **and categorized**:

Baseline Viewpoint

- As-is enterprise
- As-is solution

Project Management Viewpoint

- Enterprise change
- Solution change

[†] Service Realization services are a tentative decomposition to reflect DevOps practice.

[*] Lifecycle aspect naming:

- static = as-is
- dynamic = change

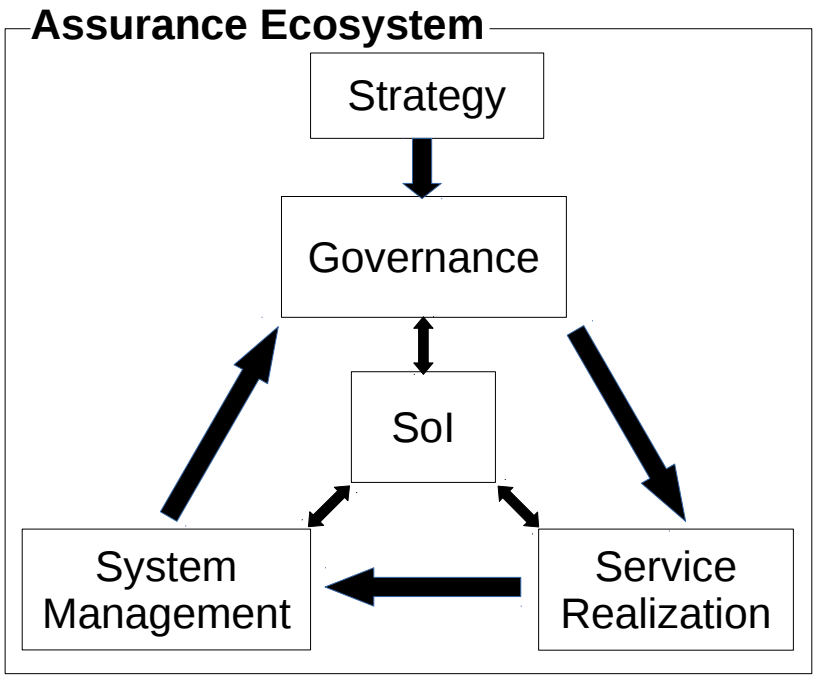
WEAF Assurance Ecosystem

Interpretation:

- Representation of business functions encompassing assurance for any business entity.
- Assurance business functions correspond to canonical assurance viewpoints.

Assurance Structure:

- Strategy establishes SoI principles and goals
- Governance ensures SoI compliance
- Service Realization ensures SoI change delivery
- System Management ensures SoI operation



Assurance Interactions:

- Strategy defines objectives for Governance
- Governance defines SoI compliance for Service Realization
- Service Realization delivers SoI to System Management
- System Management measures and reports SoI performance to Governance
- SoI stakeholders define/validate requirements and performance with each assurance function

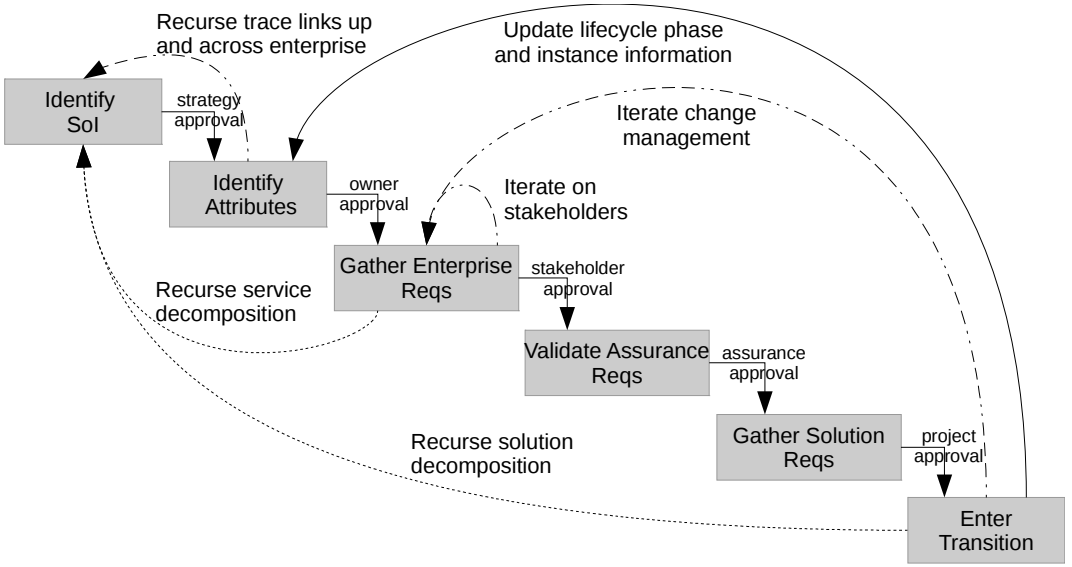
WEAF Requirement Specification

Interpretation:

- Capture and presentation of SoI attributes and requirements.
- Locates SoI in enterprise model.
- Central tool to enforce coverage and traceability.

Coverage:

- Position in enterprise
- Relevant strategy, objectives, and design guidance
- Stakeholder requirements
- Assurance requirements
- Solution requirements
- Indirect dependencies



SoI attributes	<SoI attributes>	<values>		<specification guidance derived from attributes>			
Enterprise requirements	<SoI services decomposition> . . .	<Enterprise layers>					
		<reqs>					
Assurance requirements	<Assurance viewpoint services regarding SoI>	<Enterprise layers>					
Solution requirements	<Enterprise services and solution components decomposition>	<Solution reference architecture layers/components>					

Traceability:

- Trace links up to strategy, goals, objectives
- Trace links across to indirect system, service, and role dependencies
- Trace links down to solution components and instances

WEAF Requirement Specification - Template

Interpretation:

- Representation of SoI attributes and requirements.
- Attributes locate SoI in enterprise model and identify trace links up and across enterprise.
- Requirements specified for enterprise and solution layers.

Attributes:

Generic

- Unique ID
- Owning Role
- Supported services
- Containing systems
- Supported phases
- Lifecycle phase
- Version

Type specific

- Process
- Trigger process
- Consumer process

- Resource
- Location

- ...

Attributes	SoI name	<value>	<specification guidance>				
	SoI owner	<role>	<primary stakeholder>				
	Supported Services	<service list>	<additional stakeholders>				
			<dependencies/event-driven process chain>				
	Containing Systems	<system list>	<indirect dependencies: related components, and cohabiting services>				
	Lifecycle Phase	<phase name>	<lifecycle phase principles> <lifecycle management processes>				
	Version	<name>					
Enterprise Requirements	<layer principles>	PP1, PP2,...	BP1, BP2,...	...	...	...	...
	<enterprise layers>	Performance	Business	Information	Application	Resources	Security
	SoI Objective						
	<decomposition>						
	S1						
	S2						
	...						
Assurance Requirements	<layer principles>	PP1, PP2,...	BP1, BP2,...	...	...	...	...
	<enterprise layers>	Performance	Business	Information	Application	Resources	Security
	Governance services						
	Management services						
	Realization services						
Solution Requirements	<layer principles>	CCP1,...	LCP1,...	...	...	...	...
	<reference arch layers>	Consumer	Business Logic	...	...	...	...
	<enterprise services>						
	<decomposition>						
	S1-c1						
	S1-c2						
	...						

Requirements:

- Enterprise
  - Begin with objective as a business requirement
  - Design guidance provided by layer principles
- Assurance
  - Extracted from the enterprise section (e.g. performance metrics)
  - Validated by assurance stakeholders
- Solution
  - Enterprise requirements translated to ref arch for detailed design

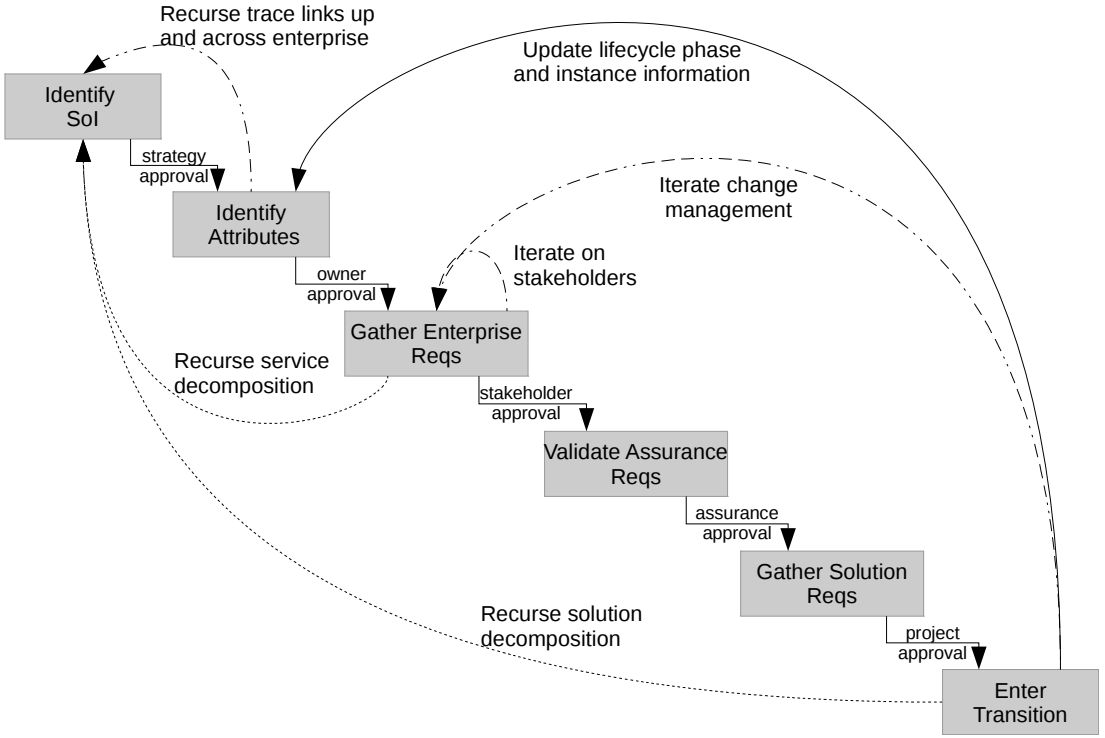
WEAF Requirement Specification - Methodology

Interpretation:

- Process to collect SoI requirements.
- Identifies SoI location within the enterprise model.
- Enforces coverage of stakeholder concerns.
- Enforces traceability of requirements from strategy to deployed instance.

Iteration:

- Coverage of stakeholder concerns
- Management of requirement changes



Recursion:

Trace up and across

- Trace up to goals, principles, drivers, and constraints.
- Trace across to indirect system and service dependencies

Trace down

- Decompose services to level suitable for translation into solution requirements.
- Decompose solution into components suitable for translation into implemented instances.
- Update SoI information with instance details