

# Using TOGAF® to Define and Govern Service-Oriented Architectures

August 2011

# Why EA & SOA?

- Avoid scope of SOA being individual projects
- Consistent usage of SOA cross enterprise
- Connecting SOA to the bigger business problem
- Reuse of services across business lines
- Define where SOA should be used
- Justify SOA infrastructure investment
- Deliver the expected business value

# TOGAF®

- Detailed method and supporting tools for doing EA
- Codifies good practices that have evolved since mid-nineties
- Used by 80 percent of Fortune Global 50
- More than 15,000 certified
- TOGAF's ADM
  - breaks complex process of architecture development into a number of simpler steps, or *phases*, in which the architect consider different aspects of the overall problem

# The Guide In a Nutshell

- Adoption of TOGAF Architecture Development Method (ADM) to SOA
- Best-practice views for SOA in all ADM phases to manage stakeholder concerns
- Adoption and extension of the TOGAF Content Meta-model for SOA particularly around information architecture
- SOA on different architecture levels (strategic, segment, capability)
- Connection of other SOA Working Group deliverables:
  - SOA Governance Framework
  - SOA Maturity Model (OSIMM)
  - SOA Reference Architecture
  - SOA and Security

# Using TOGAF for Enterprise SOA: A Phased Approach

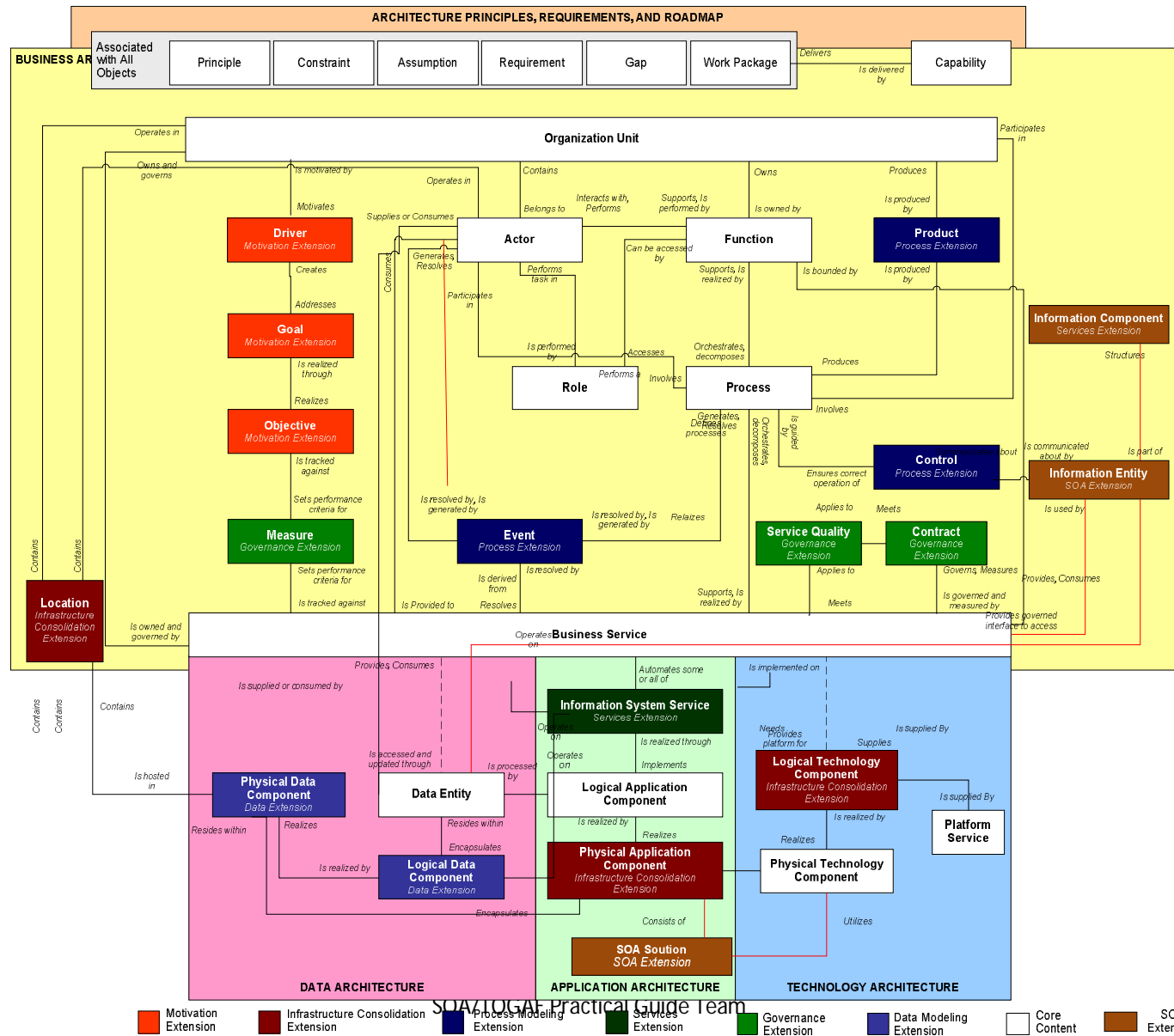
- Preliminary Phase
- Phase A: Architecture Vision
- Phase B: Business Architecture
- Phase C: Information Systems Architecture
- Phase D: Technology Architecture
- Phase E: Opportunities and Solutions
- Phase F: Migration Planning
- Phase G: Implementation Governance
- Phase H: Architecture Change Management

# Preliminary Phase

## Setting the Scene

- Principles
  - Service Orientation
- Determining Organization Readiness for SOA
  - The Open Group Service Integration Maturity Model (OSIMM)
- Governance
  - The Open Group SOA Governance Model and Vitality Method
- Adapting Reference Architectures to the Organization:
  - The SOA Reference Architecture
- Establishing a SOA Center of Excellence as an initial “Footprint”

# SOA Meta-model (TOGAF style)



# Updated meta-model entities

Extension Term (meta-model object)	Description
Information Entity	Information communicated about within the business
Information Component	An ideal grouping of Information Entities fulfilling one or more principles. These will be the base for the structure of the SOA Information Exchange Model (Canonical Information Model).
IS Service Contract	An agreement between an IS service consumer and an IS service provider that establishes functional and non-functional parameters for interaction.
SOA Solution	The requirements and architecture (structure) of entire solution including process, information, service and infrastructure requirements.
Service Quality	The Service Quality meta-model object is used as an attribute to services, components, and contracts The Service Qualities defines the non-functional requirements.
Location	The Location meta-model object is used as an attribute to a service or component.



# Preliminary Phase Enhancements



## Objectives

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

## Inputs

- Existing SOA Reference Architectures
- Existing industry SOA Maturity models
- Existing SOA Governance Frameworks
- Existing Industry best practice SOA principles

## Steps

- Identify stakeholder concerns
  - SOA specific concerns
- Define scope
  - Ensure scope is appropriate for SOA
  - Tailor deliverables to level of architecture
- Evaluate Business Capabilities
  - SOA readiness
- Confirm Principles
  - SOA supporting Principles

## Outputs

- Statement of Architecture Work
  - with SOA as an approach
- Architecture principles
  - including SOA principles)
- Capability assessment
  - including SOA readiness
- Architecture Vision
  - with SOA thinking)
- Additional content populating the Architecture Repository
  - including SOA Reference Architecture)

# Phase A Vision Enhancements



## Objectives

- No additional objective material

## Inputs

- Organizational Model
  - SOA Centre of Excellence
  - SOA Maturity Assessment
  - SOA Readiness Assessment
  - SOA Governance
- Tailored Architecture Framework
  - SOA meta-model extensions
  - SAO Reference Architecture
- Available higher-level (Strategic/Segment) architecture

## Steps

- Identify stakeholder concerns
  - SOA specific concerns
- Define scope
  - Ensure scope is appropriate for SOA
  - Tailor deliverables to level of architecture
- Evaluate Business Capabilities
  - SOA readiness
- Confirm Principles
  - SOA supporting Principles

## Outputs

- Statement of Architecture Work
  - with SOA as an approach
- Architecture principles
  - including SOA principles
- Capability assessment
  - including SOA readiness
- Architecture Vision
  - with SOA thinking
- Additional content populating the Architecture Repository
  - including SOA Reference Architecture

# Phase B Enhancements



## Objectives

- No additional objective material

## Inputs

- Organizational Model
  - SOA Centre of Excellence
  - SOA Maturity Assessment
  - SOA Readiness Assessment
  - SOA Governance
- Tailored Architecture Framework
  - SOA meta-model extensions
  - SOA Reference Architecture
- Available higher-level (Strategic/Segment) architecture

## Steps

- Select Reference models, viewpoints & tools
  - SOA meta-model & content extensions
  - Information Entity & Information Component

## Outputs

- Validated business Principles
  - SOA supporting Principles
- Target Business Architecture
  - Business Service (with contract)
  - Business Process
  - Information Entity
  - Information Component
- Draft Architecture Requirements
  - Technical requirements for SOA
- Outputs may include
  - 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 B Artifacts

Artifact	Purpose	Meta-model entities
Business Service Interaction Diagram	This diagram shows all the business services in scope and their relations and the information flowing between the business services	Business services, Contracts, Information Entity
Business Process Diagram	This is a set of diagrams that show the business processes and their decomposition, their interactions, and the information with which they are concerned.	Subset of business service model showing the Business services and Contracts involved in the processes and the Business information passed between the Business services.
Business Vocabulary Catalog	List of the key terms used in describing the business processes and information.	This is a list of Information entities and descriptions of those elements.
Business Services Catalog	This is a list of the enterprise's business services and their functional and non-functional requirements.	List of Business services and their Service Qualities
Business Service/Location Catalog	To understand where the business services needs to be executed.	Business Service, Location
Event/Process Catalog	To understand which process is run in relation to an event	Lists Event and their effected Business process
Contract/Service Quality Catalog	To understand the non-functional properties of a contract	Lists Contracts and their relevant Service Qualities
Business Service Interaction Matrix	To show relations between Business Services	Business services on both axis and contracts in the cross point
Business Service/Information Matrix	To show how information entities are used by business services and to find faults in that model	Business services and Information entities
Information Component Model	To define the logical structure of the information in the organization.	Information Components and their relations.

# Phase C Enhancements



## Objectives

- Extend Applications section to include 'Applications & Services'

## Inputs

- Organizational Model
  - SOA Centre of Excellence
  - SOA Maturity Assessment
  - SOA Readiness Assessment
  - SOA Governance
- Tailored Architecture Framework
  - SOA meta-model extensions
  - SOA Reference Architecture
- Available higher-level (Strategic/Segment) architecture

## Steps

- Select Reference models, viewpoints & tools
- SOA meta-model & content extensions
- IS Service Contract
- Relationship between IS Service & Data Entity

## Outputs

- Validated business Principles
  - SOA supporting Principles
- Target Information Systems Architecture
  - IS Service (with contract)
  - Service Portfolio
- Draft Architecture Requirements
  - Technical requirements for SOA
- Outputs may include
  - 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 C Artifacts

Artifact	Purpose	Meta-model entity usage
IS Service Interaction Diagram	This shows potential SOA services (IS Services) and the interactions between them, and their use of information.	IS Services and the Contracts between them. Preferably the Service Quality entity for both IS Services and Contracts
Business Process/IS Service Matrix	This matrix shows the relation between each Business Process and the IS Services supporting the process	Business Process and its relation to IS Service(s).
IS Service Contract Catalog	The catalog lists all IS Services, their Contracts and the related Service Qualities to enable analysis of the non-functional requirements for potential SOA Services.	List of IS Services and their related Service Qualities. Additionally IS Service Contracts for each IS Service is included.
IS Service/Application (existing) catalog	This catalog connects IS Services (potential SOA Services), Contracts and Service Qualities with existing applications (baseline Physical Application Components)	IS Service(s), related Contracts and Service Qualities connected with as-is Physical Application Components.
IS Service/Data entity matrix	This matrix shows what data is handled by potential SOA Services (IS Services).	IS Services and its related Data Entities
Logical SOA Component Matrix	This matrix shows the relationship between the logical SOA Components (Logical Application Components) and the potential SOA Services (IS Services)	IS Services, Logical Application Components and Principles & Business Drivers (used to find criteria to do grouping).
Logical SOA Solution Diagram	This diagram shows the relations between the logical SOA components (Logical Application Components) and other logical solutions (Logical Application Components).	Logical Application Components and Contracts and their Service Qualities. Logical Technology components and their mapping to Contracts are used for the interface mechanisms.
IS Service Distribution Matrix	This matrix shows the services distributed on physical locations to fulfill legal or other requirement	IS Service, Logical Application Component, Physical Application Component and Location.

# Phase D Enhancements



## Objectives

- No additional objective material

## Inputs

- Organizational Model
  - SOA Centre of Excellence
  - SOA Maturity Assessment
  - SOA Readiness Assessment
  - SOA Governance
- Tailored Architecture Framework
  - SOA meta-model extensions
  - SAO Reference Architecture
- Available higher-level (Strategic/Segment) architecture

## Steps

- Select Reference models, viewpoints & tools
  - SOI Reference Model
  - Relationship between Logical Technology Component & Logical Application Component

## Outputs

- Validated business Principles
  - SOA supporting Principles
- Target Technology Architecture
  - Expected processing load & distribution of load across technology
- Draft Architecture Requirements
  - Technical requirements for SOA
- Outputs may include
  - Logical Technology Architecture Diagram
  - Logical Application and Technology Matrix

# Phase D Artifacts

Artifact	Purpose	Meta-model entity usage
Logical Technology Architecture Diagram	This diagram is used to show and analyze the instance of the Open Group SOA Reference Architecture.	Platform Service (Capability), Logical Technology Component (ABB)
Logical Application and Technology Matrix	This matrix is used to show and analyze the relations between the Logical Application Components and the Logical Technology Components	Logical Application Components and their relations to Logical Technology Components including derivations of the Service Qualities.



# Phase E Enhancements



## Objectives

- No additional objective material

## Inputs

- Organizational Model
  - SOA Centre of Excellence
  - SOA Maturity Assessment
  - SOA Readiness Assessment
  - SOA Governance
- Tailored Architecture Framework
  - SOA meta-model extensions
  - SOA Reference Architecture
- Available higher-level (Strategic/ Segment) architecture

## Steps

- Select Reference models, viewpoints & tools
  - Physical Data Component
  - Physical Application Component
  - Technology Application Component
  - SOA Solution

## Outputs

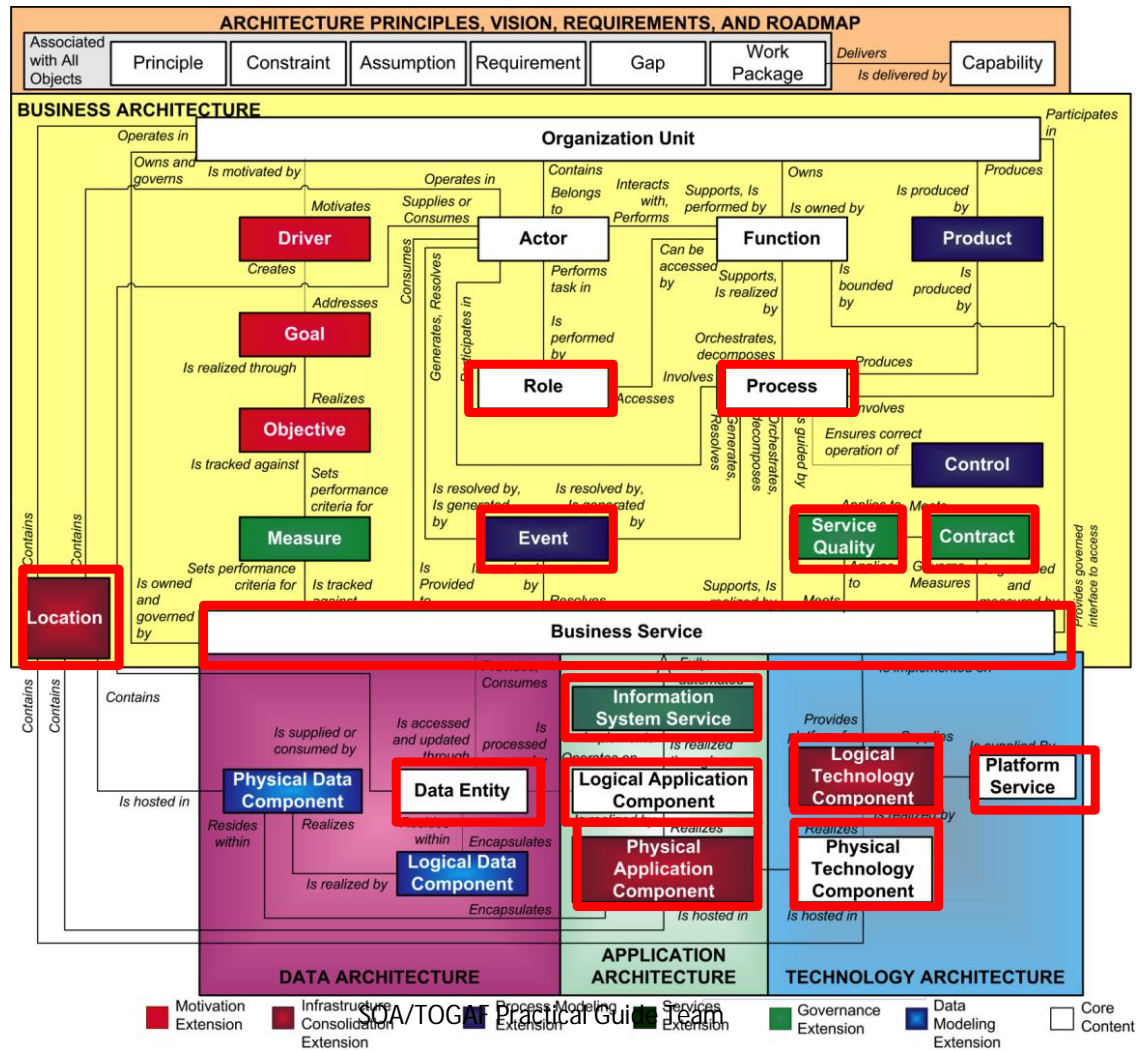
- Architecture Roadmap
  - SOA & SOI Roadmap
- Draft Architecture Requirements
  - Technical requirements for SOA
- Outputs may include
  - Physical SOA Solution Matrix
  - Physical SOA Solution Diagram
  - Physical Service Solution Matrix
  - Application Guidelines
  - Physical Technology Architecture diagram
  - Physical Application and Technology Matrix
  - Technology Portfolio Catalog
  - Technology Guidelines

# Phase E Artifacts

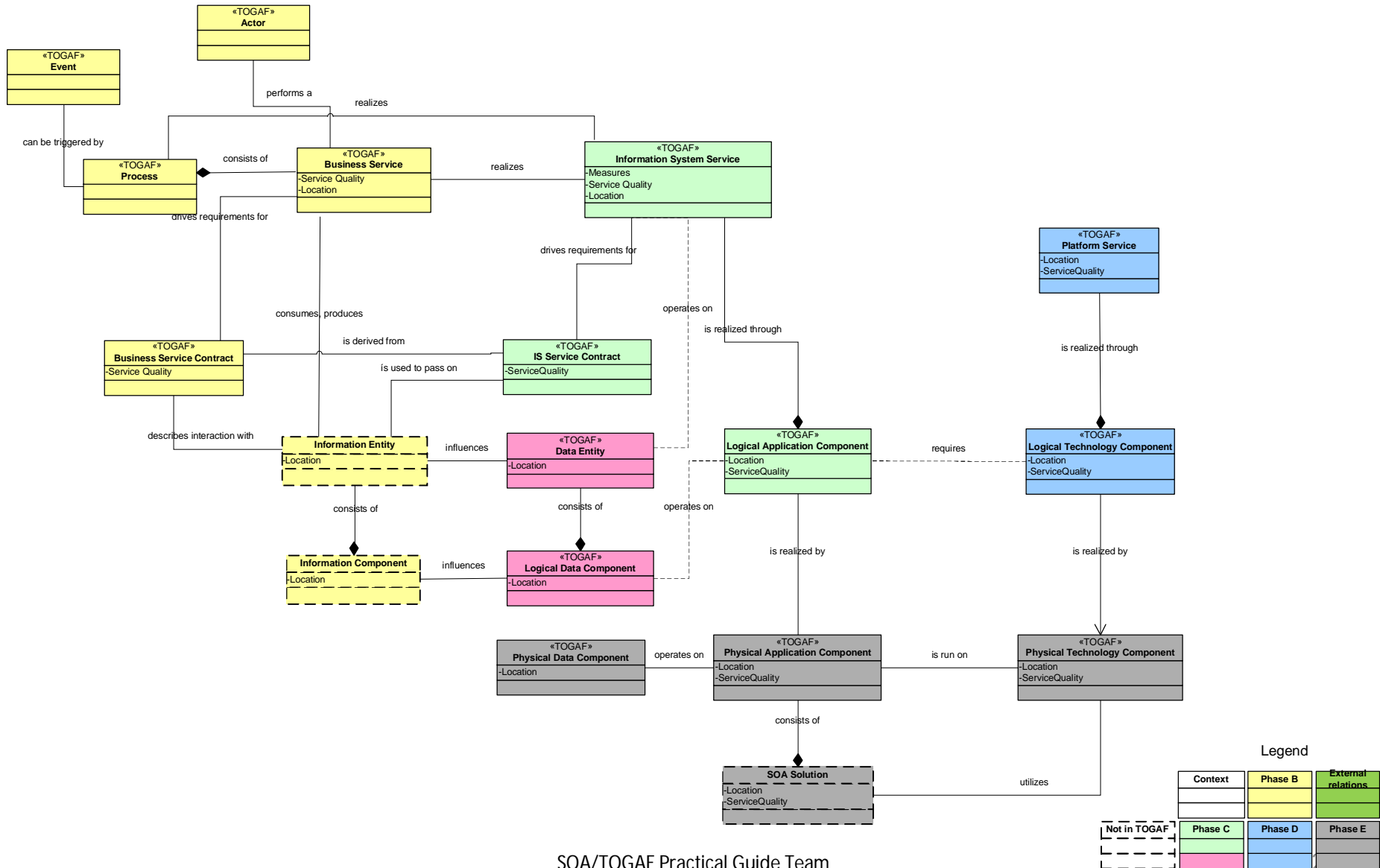
Artifact	Purpose	Meta-model entity usage
Physical SOA Solution Matrix	This matrix shows all the components of a SOA Solution	IS Services, Physical Application Components, Platform Services, Physical Technology Components
Physical SOA Solution Diagram	This diagram shows the relations between the physical SOA solution (Physical Application Components) and other solutions (Physical Application Components).	Physical Application Components and Contracts and their Service Qualities. Physical Technology components and their mapping to Contracts are used for the interface mechanisms.
Physical Service Solution Matrix	This matrix shows which existing services are re-used, which services could be provided by external services (SaaS) and which services needs to be developed as wrappings of new/existing applications and which needs to be developed.	IS Services, Physical Application Components (as-is SOA services for re-use), other Physical Application Components (new and existing applications to be wrapped) and new Physical Application Components (new services to be developed or purchased externally)
Application Guidelines	This document provides the guidelines on how to develop the SOA Solution and Services.	
Physical Technology Architecture diagram	This diagram is used to show and analyze the physical technical solution for the SOA infrastructure.	Platform Service, Logical Technology Component, Physical Technology Component
Physical Application and Technology Matrix	This matrix is used to show and analyze the physical infrastructure used to run the physical application	Physical Application Components and their relations to Physical Technology Components including derivations of the Service Qualities.
Technology Portfolio Catalog	This is a list of products and kinds of product that will be used in the implementation, including SOA run-time infrastructure,	Physical Application Components and their relation with Service Qualities
Technology Guidelines	This document provides the guidelines on how to use SOA infrastructure	

# Appendix

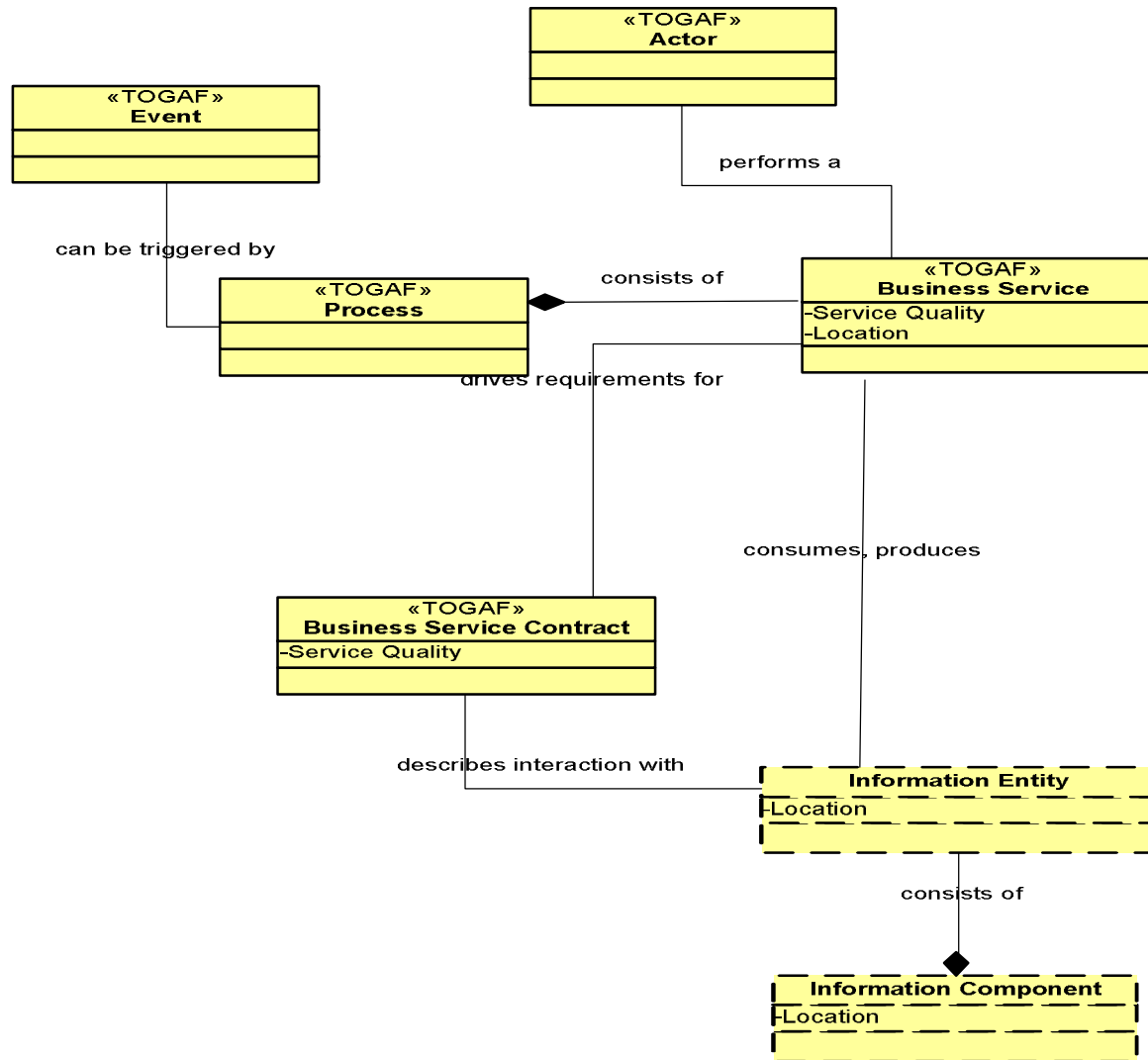
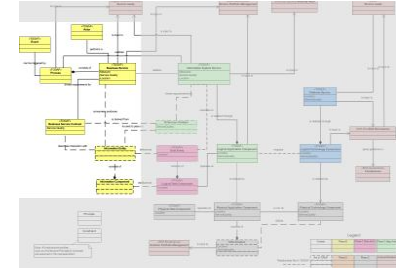
# Meta-model is the core



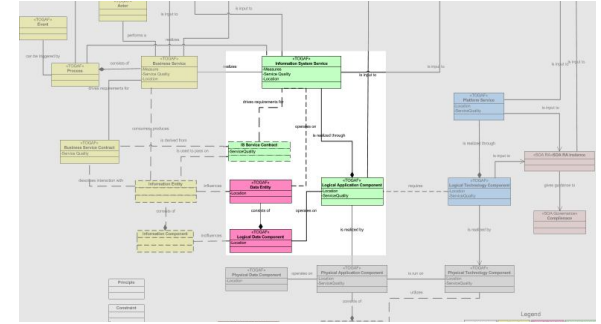
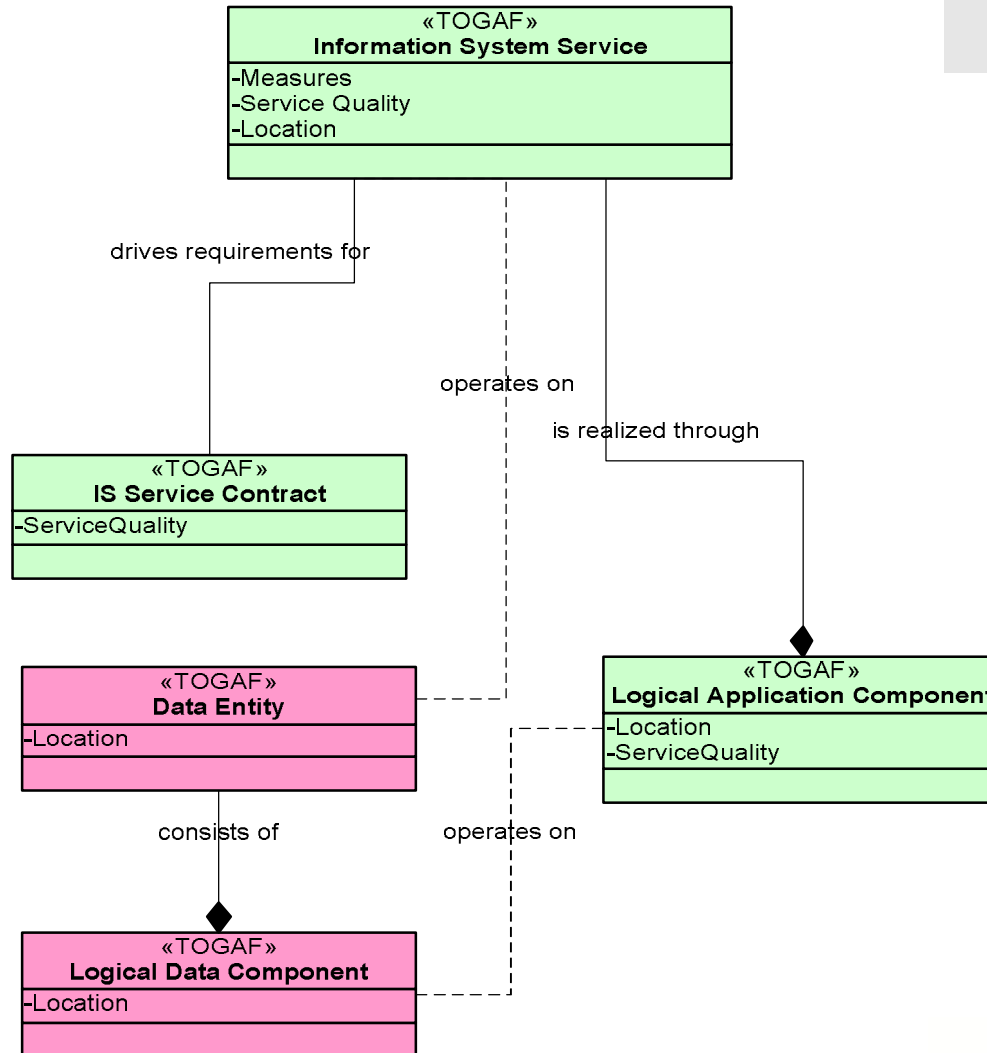
# SOA Meta-model



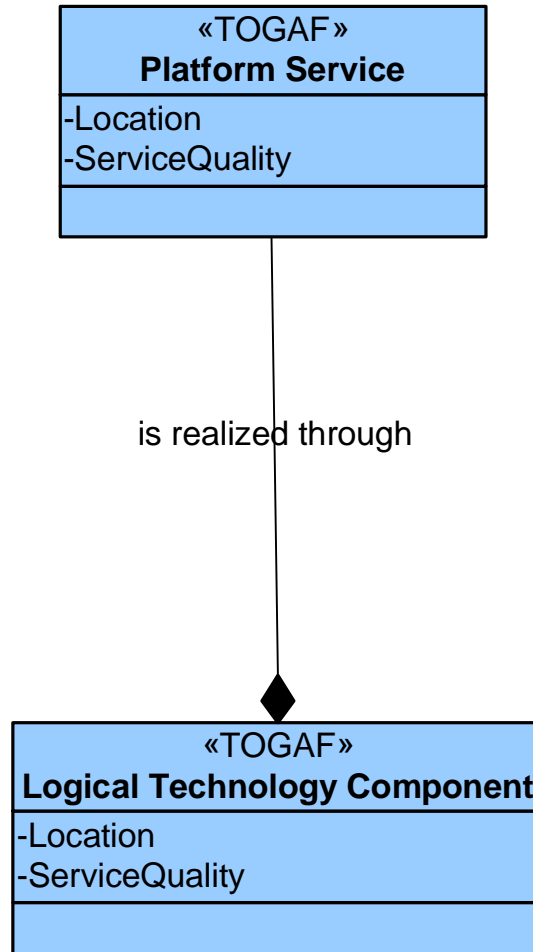
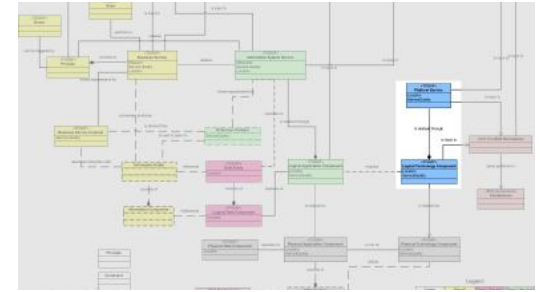
# Phase B



# Phase C

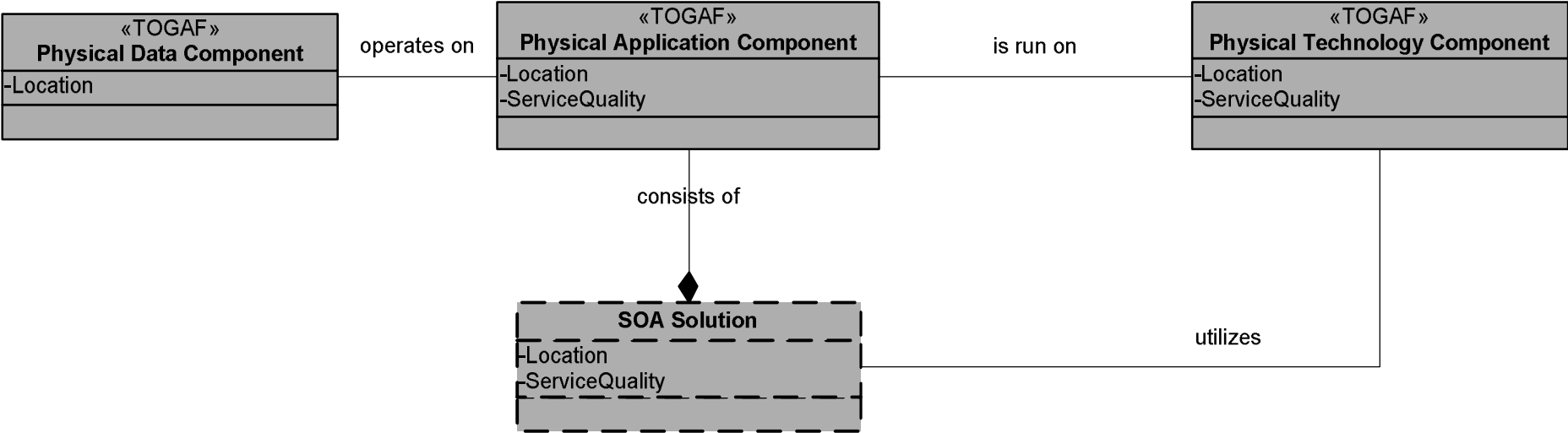
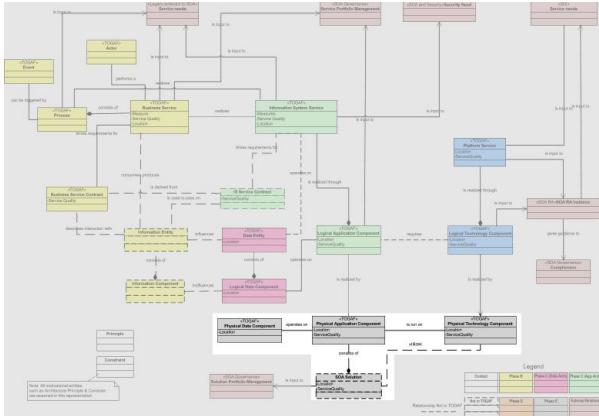


# Phase D

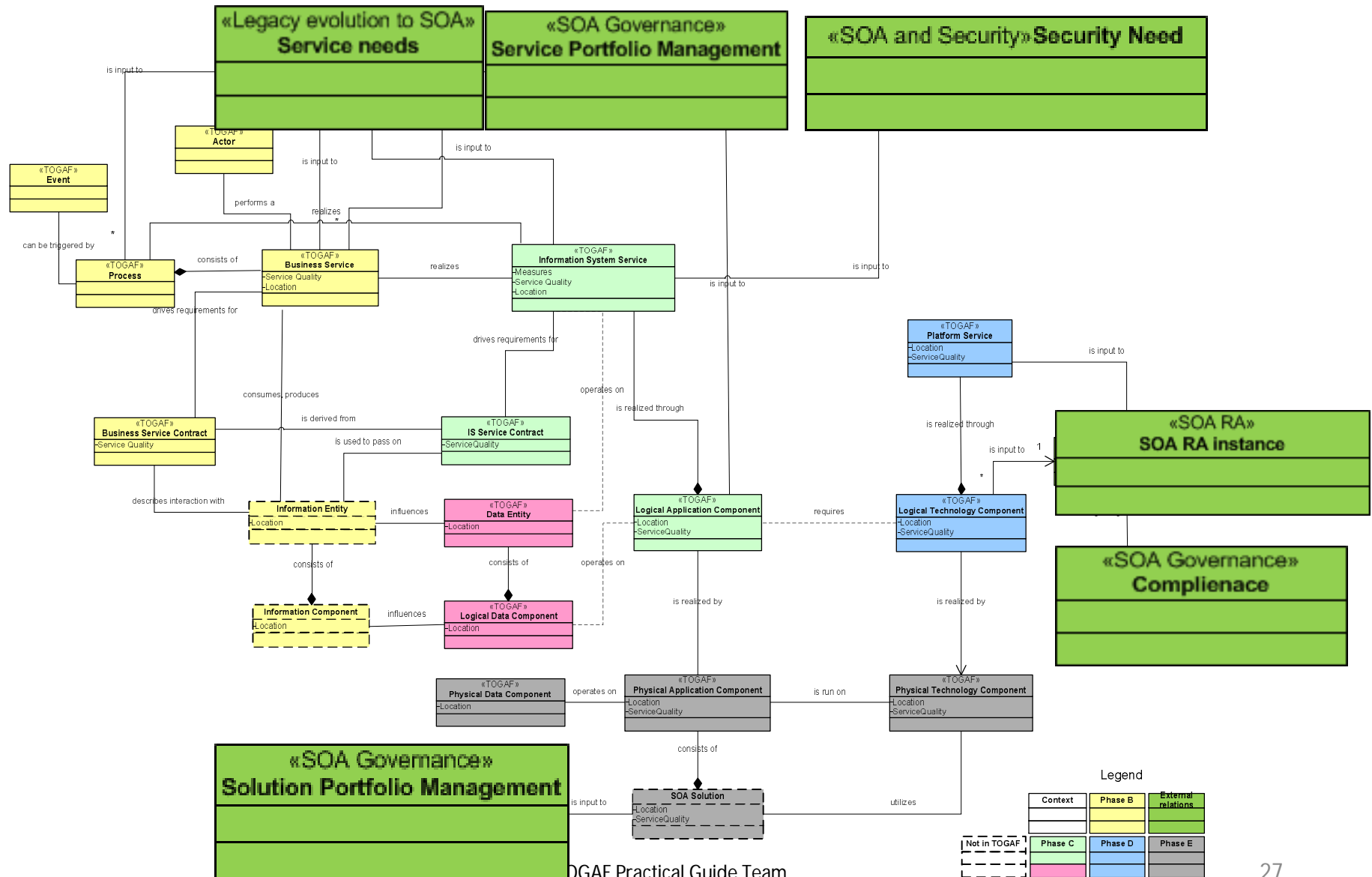




# Phase E



# Relations to SOA WG projects



# The Open Group

<http://opengroup.org/>