Standard SOA Reference Models and Architectures

The Open Group Perspective
4 February 2009

THE *Open* GROUP

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Welcome to San Diego!

Agenda

- ❑ The Open Group's Standpoint
- ❑ The Open Group's SOA Work
  - ▪ Overlap with OASIS and OMG work
- ❑ A vision of the future
  - ▪ And the value that harmonization can deliver

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The Open Group's Standpoint

The Open Group

- Vendor- and technology-neutral consortium
- Vision of Boundaryless Information Flow™
- Forums and Work Groups
- Consortia and Program Management
- Certification
- The Home of Enterprise Architecture

www.opengroup.org

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The Home of Enterprise IT Architecture

- ❑ The Open Group Architecture Framework (TOGAF™)

- ❑ Certification for architects and for architecture products and services

- ❑ The Association of Open Group Enterprise Architects (AOGEA)

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Computers Do What They Are Told

$$a = b * c$$

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People Argue

"My system will give you a 25% return on investment"

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ROI Model

Current Sales	Cost of System	Sales Next Year	Return
$25,000	$100,000	$50,000	25%

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ROI Reference Model

$$ROI = \frac{\text{Increase in revenue}}{\text{Development Cost X 100}}$$

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How Architects Use Models

Reference Model

Model → Implementation specification

View
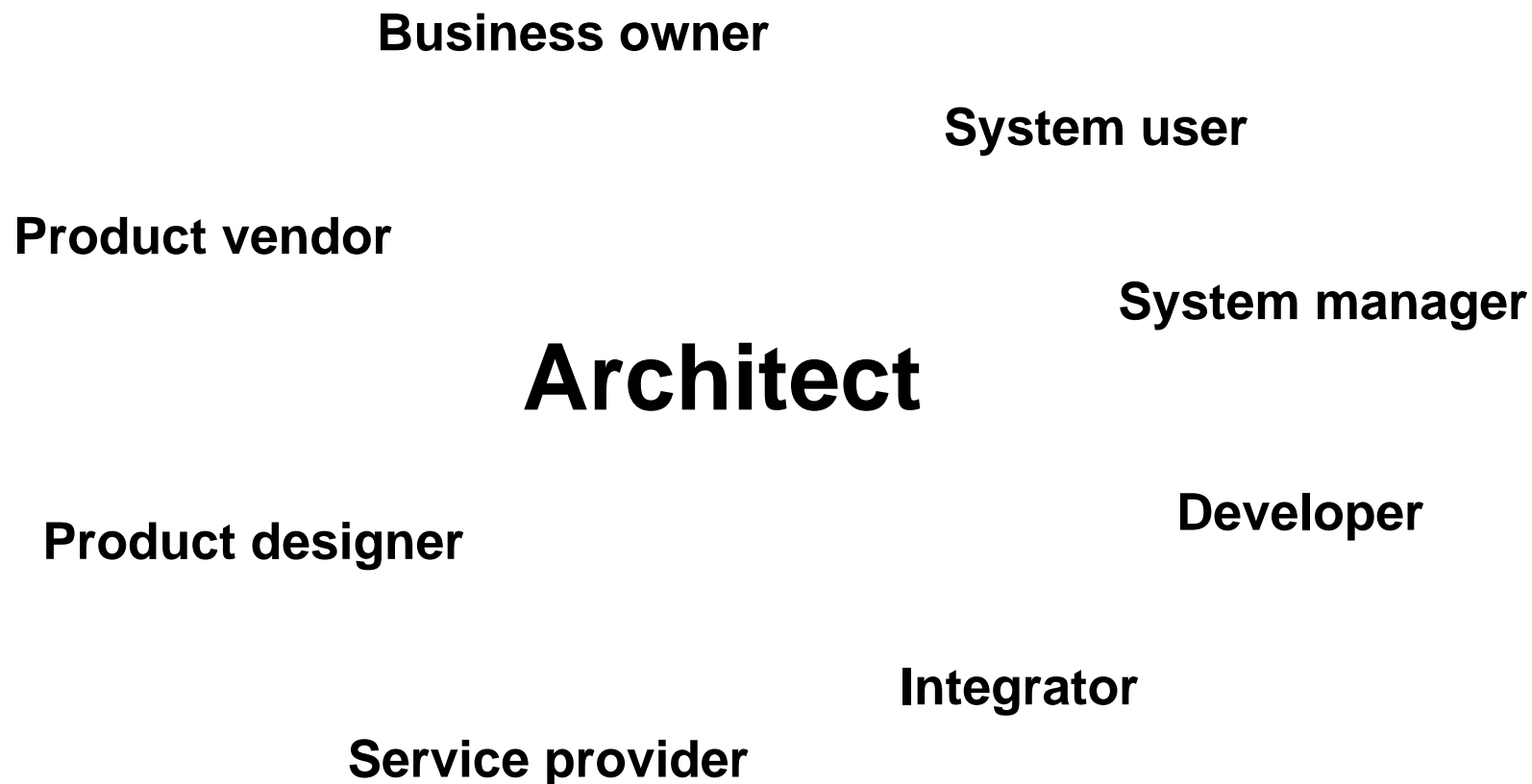
Discussion of stakeholder concerns
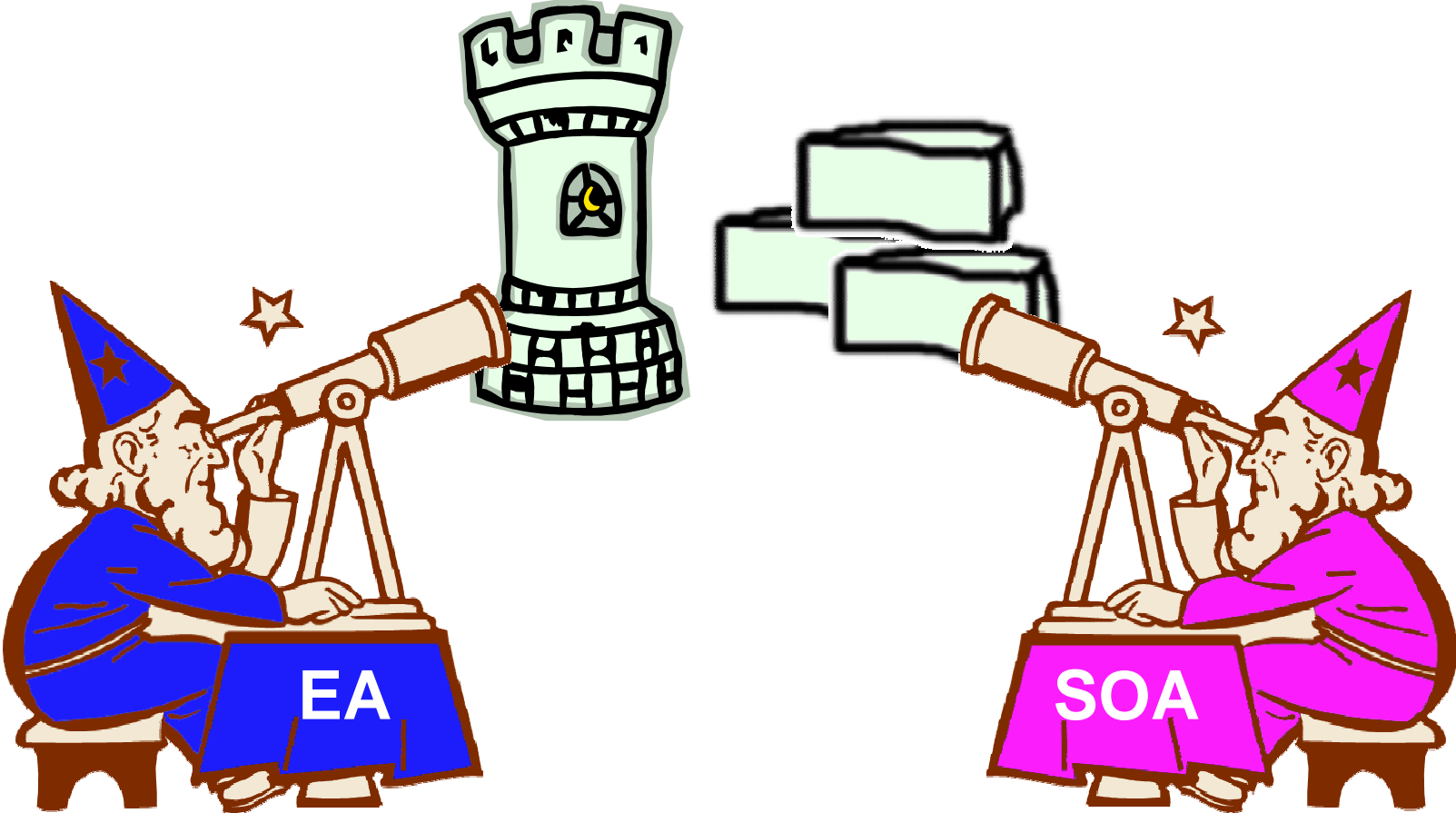
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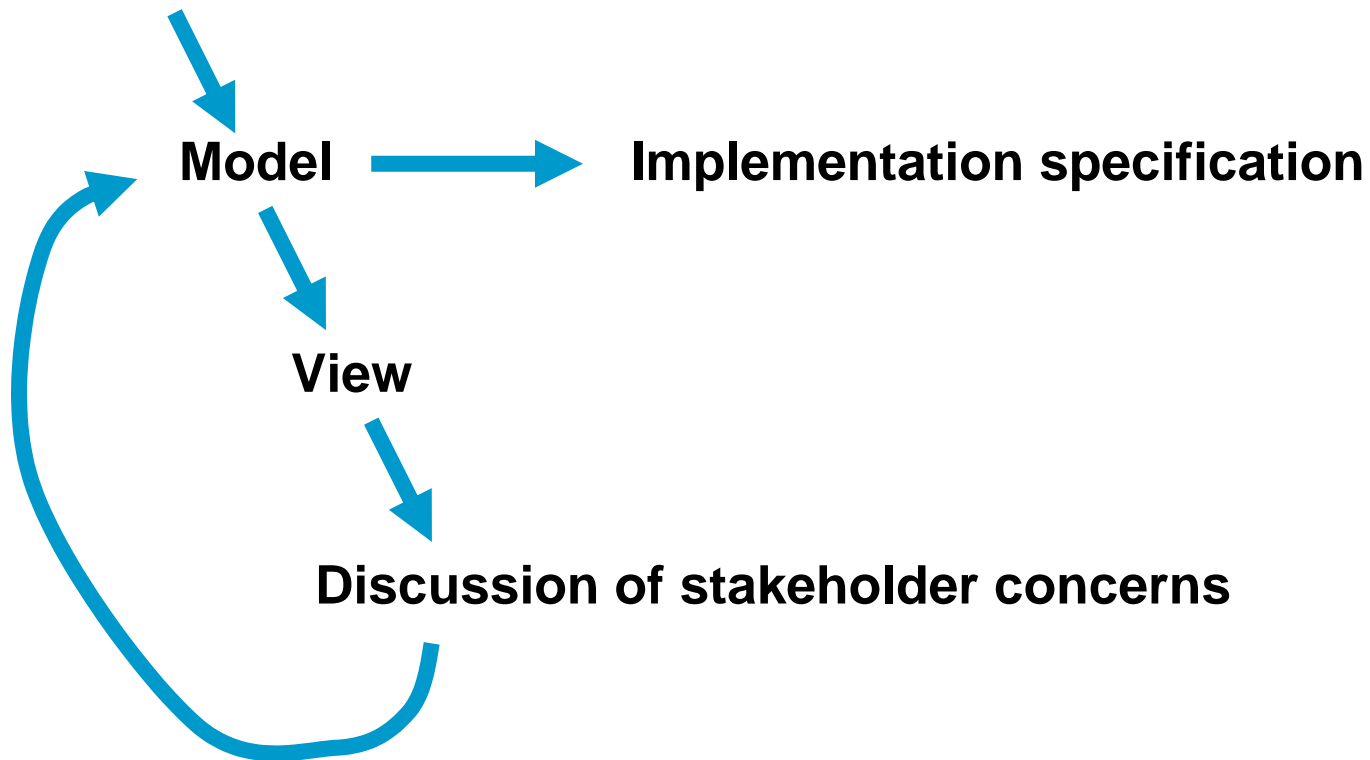
SOA-Related Models

- Service/Applications Matrix
- Service/Technology Matrix
- Technology Portfolio
- Business Process/Service Matrix
- Service Interaction Model
- Service Loading Model
- Business Roles Catalog
- Service Consumers Matrix
- Service Access Control Model
- Service Configuration and Provisioning Model
- Service/Physical System Matrix
- Business Vocabulary
- SOA Governance Model

The Open Group's Standpoint

Business owner

System user

Product vendor

System manager

Architect

Developer

Product designer

Integrator

Service provider

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The Open Group's SOA Work

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SOA Meets EA

The SOA Working Group

- Develops and fosters common understanding of SOA in order to facilitate alignment between the business and information technology communities.

- By conducting producing definitions, analyses, recommendations, reference models, and standards

- More than 300 participants from over 50 companies

www.opengroup.org/projects/soa

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SOA WG Membership & Leadership

- ❑ Open to all Open Group Supplier and Customer Council members (Platinum members, Forum Buyout members, and Silver members)
- ❑ More than 300 participants from over 50 companies

- ❑ Forum Director
  - ▪ Dr Chris Harding, The Open Group
- ❑ Steering Committee
  - ▪ Mats Gejnevall, CapGemini, Co-Chair
  - ▪ Tony Carrato, IBM, Co-Chair
  - ▪ Chris Greenslade, CLARS, former Co-Chair
  - ▪ Jorge Diaz, IBM
- ❑ Liaison Officers
  - ▪ Ed Harrington, Model-Driven Solutions
  - ▪ Heather Kreger, IBM

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Working Group Activities

Current Projects

- Ontologies for SOA
- SOA Governance
- SOA/TOGAF Practical Guide
- Service-Oriented Infrastructure
- SOA Reference Architecture
- SOA and Security
- Legacy Evolution

Completed Projects

- Definition of SOA
- SOA Case Studies
- Value That The Open Group Can Add to SOA

Other Activities

- SOA Maturity Model
- SOA Info Architecture
- SOA Japan Work Group
- SOA Source Book

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The SOA Source Book

Introduction

- Collection of source material for use by enterprise architects working with SOA
- Material that has been considered and in part developed by The Open Group's SOA WG
- Does not represent the final output of the work program

http://www.opengroup.org/projects/soa-book/protected/

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Working Group Activities - Overlap with OASIS and the OMG

Current Projects

- **Ontologies for SOA**
- **SOA Governance**
- SOA/TOGAF Practical Guide
- Service-Oriented Infrastructure
- **SOA Reference Architecture**
- SOA and Security
- Legacy Evolution

Completed Projects

- **Definition of SOA**
- SOA Case Studies
- Value That The Open Group Can Add to SOA

Other Activities

- SOA Maturity Model
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Definition of SOA

An **architectural style** that supports **service orientation**

- **Service orientation**
  A way of thinking in terms of services and service based development and the outcomes that services bring

- **Service**
  A logical representation of a repeatable business activity that has a specified outcome (e.g., check customer credit; provide weather data, consolidate drilling reports), is self-contained and may be composed of other Services. It is a black box to consumers of the Service

- **Architectural Style**
  The combination of distinctive features in which Enterprise Architecture is done, or expressed

- The SOA Architectural style's **distinctive features**:
  - Based on the design of the services comprising an enterprise's (or inter-enterprise) business processes. Services mirror real-world business activity
  - Service representation utilizes business descriptions. Service representation requires providing its context (including business process, goal, rule, policy, service interface and service component) and service orchestration to implement service
  - Has unique requirements on infrastructure. Implementations are recommended to use open standards, realize interoperability and location transparency.
  - Implementations are environment specific, they are constrained or enabled by context and must be described within their context.
  - Requires strong governance of service representation and implementation
  - Requires a "Litmus Test", which determined a "good services"

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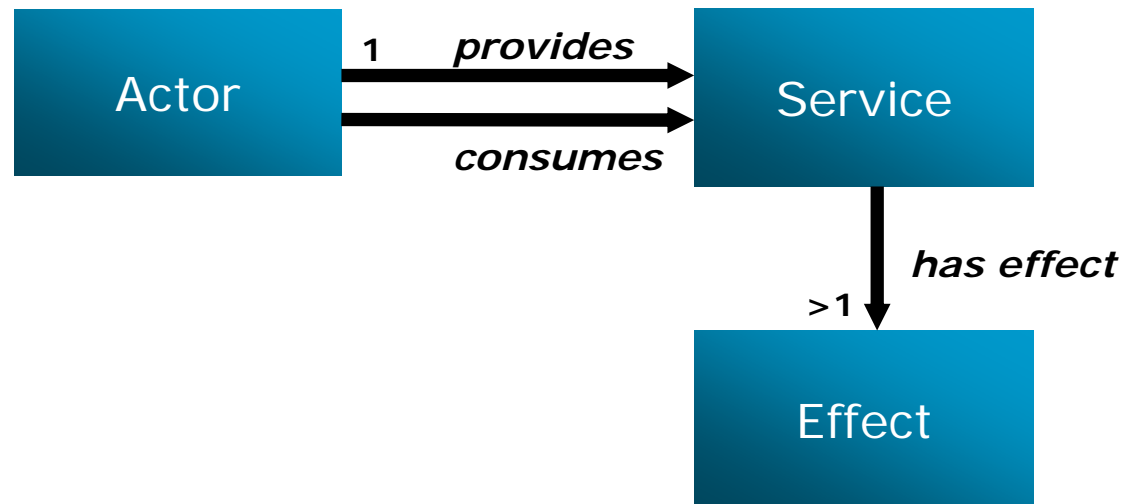*Making standards work*®

Ontologies for SOA

- Background
  - Need to improve understanding of SOA concepts
  - Ontologies can provide formal conceptual framework and also be basis for model-driven implementation
- Objectives
  - Formal OWL ontology for SOA
  - Documented so as to be generally understandable
- Current State
  - Complete draft of the ontology
    - http://www.opengroup.org/projects/soa-ontology/doc.tpl?gdid=16940
  - "Socialized" by exposure to OMG, OASIS and W3C
- Next Steps
  - Complete the formal standard
  - Open Group Company Review

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What Is An Ontology?
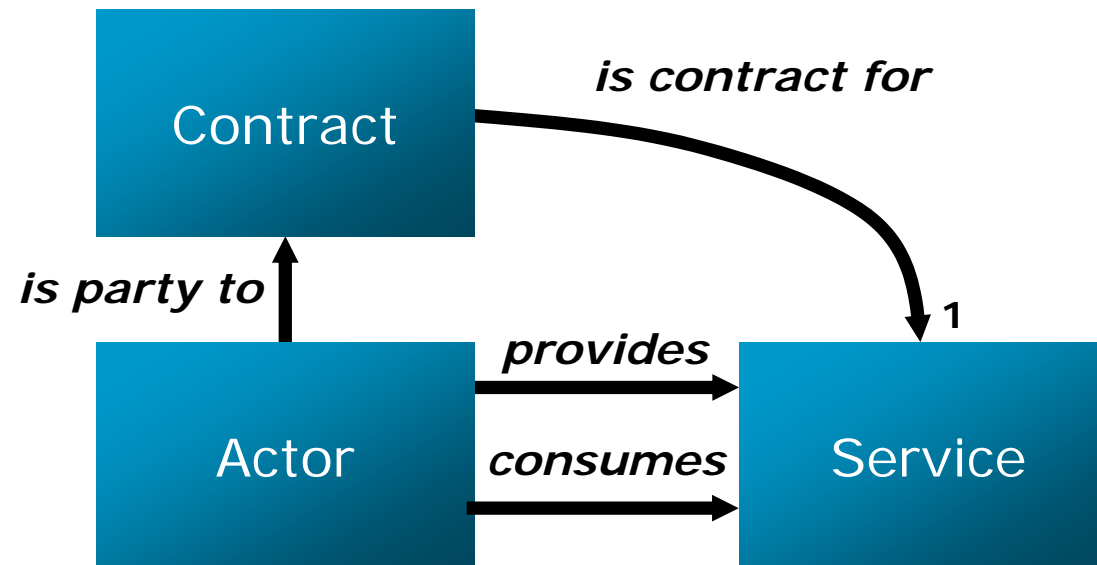
- ~~An ontology is an expression of eternal truth~~

- An ontology is a political compromise on how to use a group of words

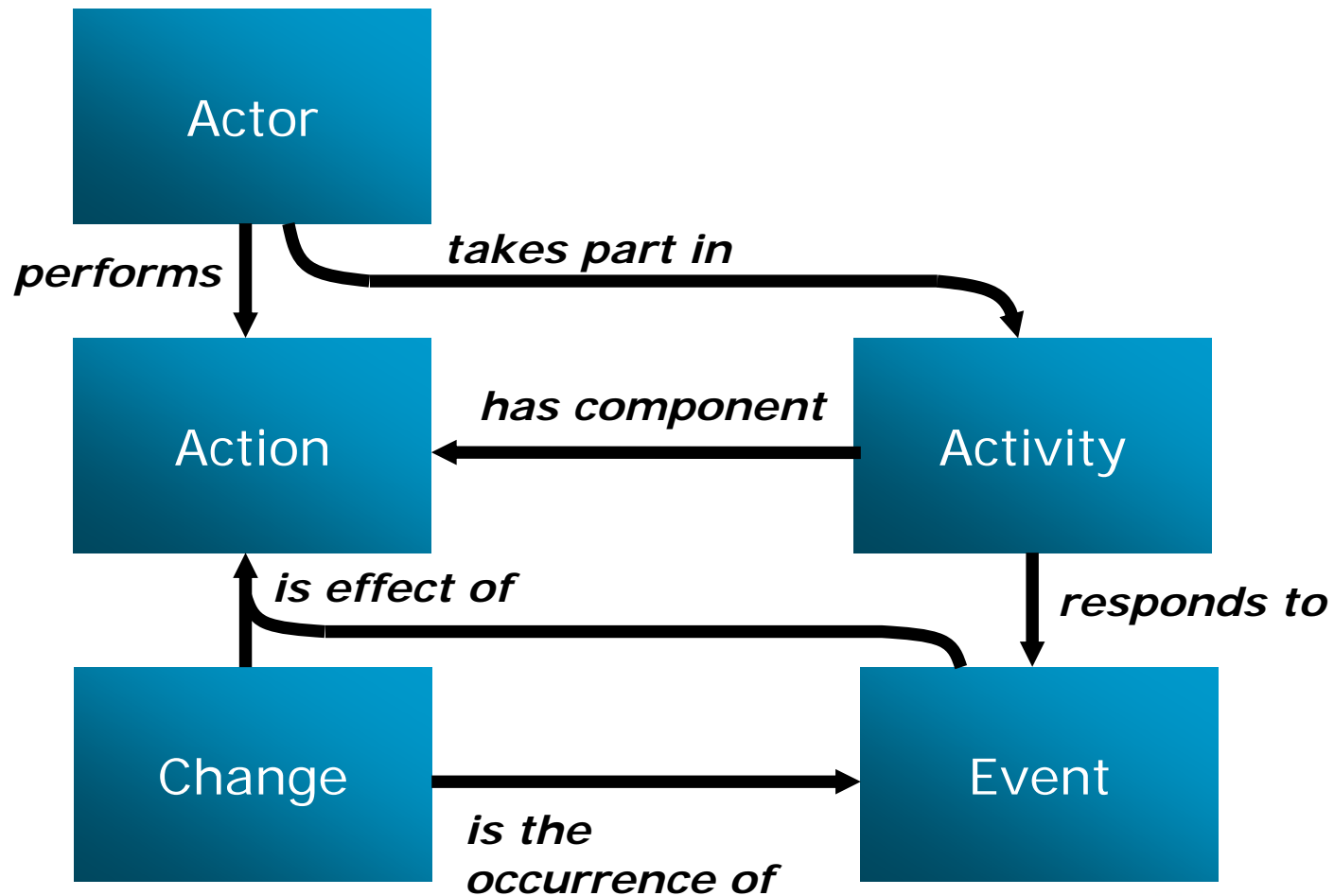 - That is sufficiently consistent for machine processing

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SOA Ontology – The *Service* Class

```
<owl:Class rdf:ID="Service">
    <rdfs:subClassOf
        rdf:resource="#Activity"/>
</owl:Class>
```

Contract

Activity

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The Intersecting Worlds of SOA

Services

Business Activities

Architecture

Governance

Design/Build

Web Services

Concept Sources

BPMN

OASIS SOA RM

IEEE 1471

TOGAF

Services

Business Activities

Architecture

Governance

Design/Build

Web Services

OWL-S

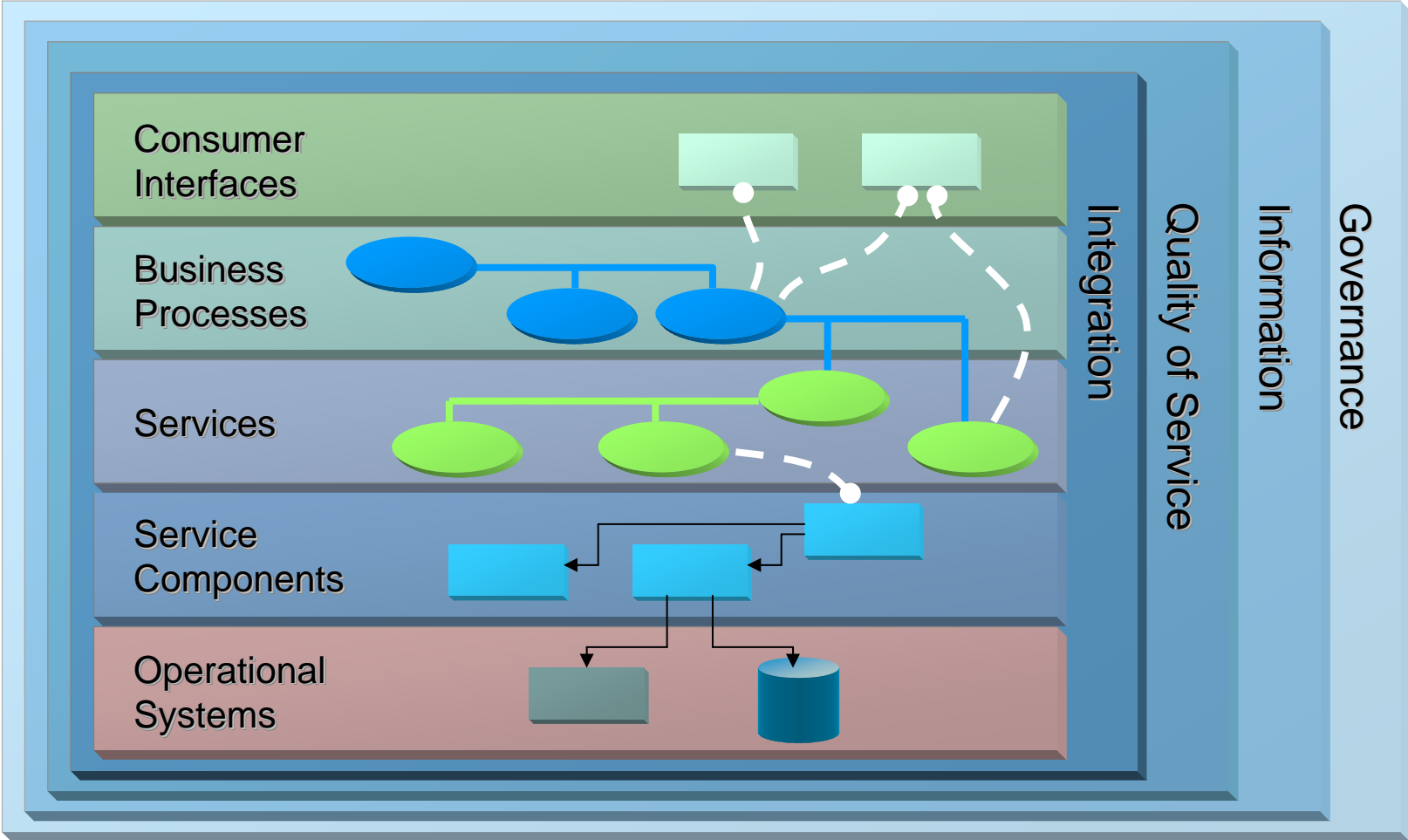THE *Open* GROUP

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SOA Reference Architecture

- ❑ Background
  - ▪ An SOA Reference Architecture will assist information technology professionals to understand and adopt SOA,
  - ▪ And can be used as an artefact in SOA development
- ❑ Objectives
  - ▪ One or more non-vendor-specific SOA reference architectures that are appropriate for use with TOGAF
- ❑ Current State
  - ▪ Base document input from IBM
  - ▪ Other input compared against base, resulting in agreed outline reference architecture
- ❑ Next Steps
  - ▪ Agree building blocks and complete draft
  - ▪ Review and publish
  - ▪ Identify appropriate certification programs

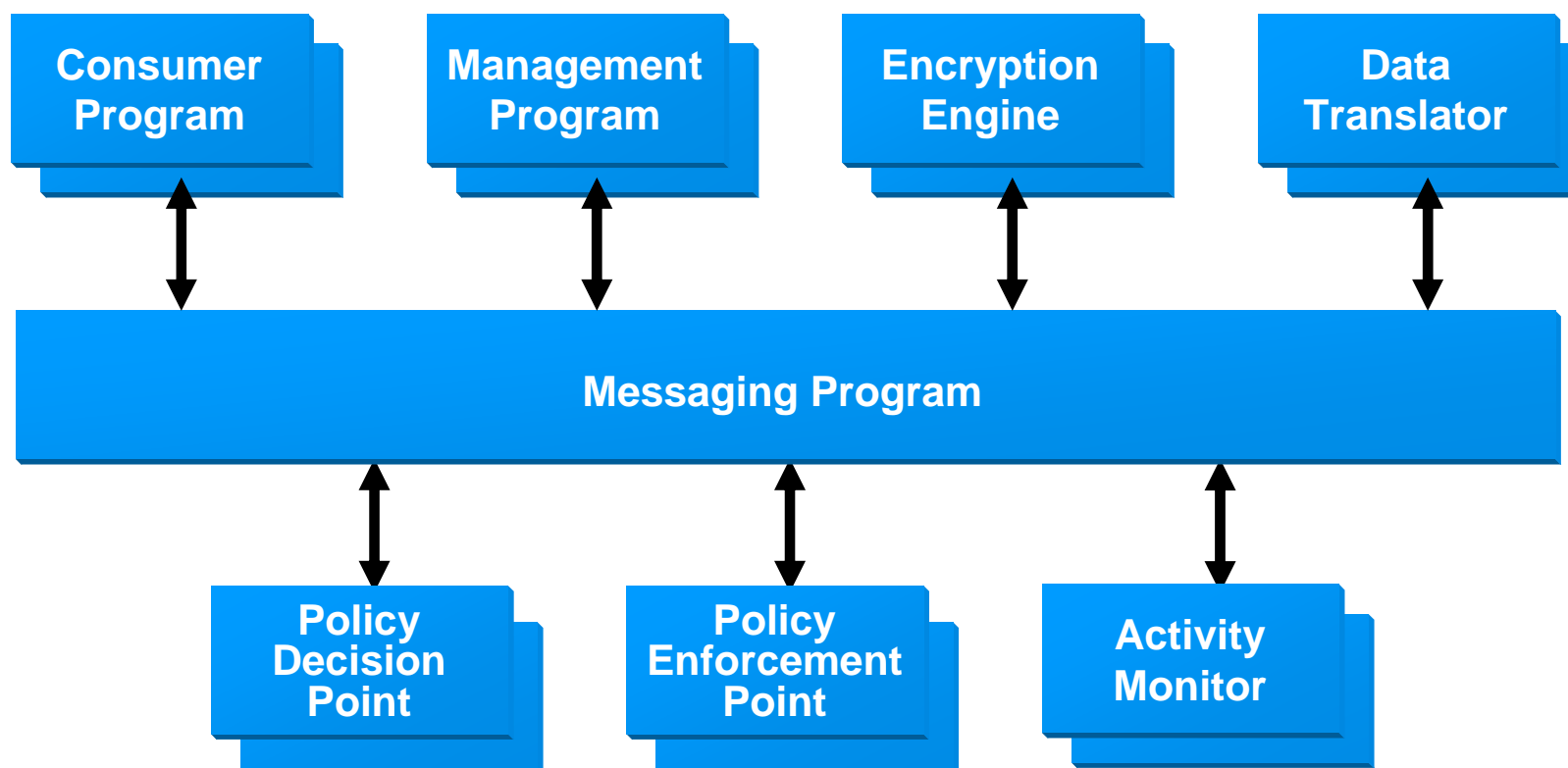THE *Open* GROUP
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SOA Reference Architecture Source Book Sections

- ❑ The Building Blocks of SOA
- ❑ A High-Level SOA Perspective
- ❑ Detailed Models for SOA Features
- ❑ Infrastructure for SOA

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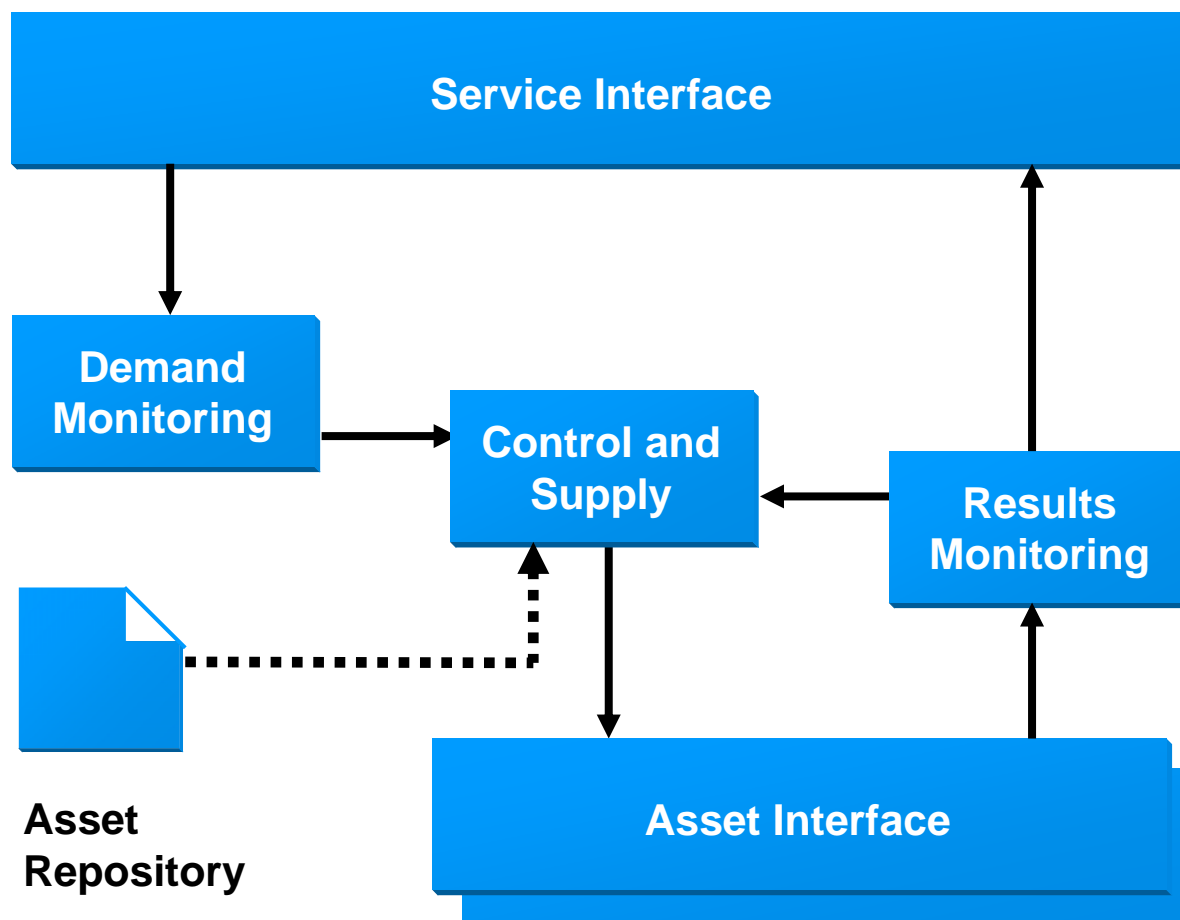
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The Open Group SOA RA – High-Level Perspective

The Open Group SOA RA – Detailed Messaging Model

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The Open Group SOA RA – Virtualization Model

Reference Architecture Evolution

- Currently just descriptive
  - Layers
  - Architecture building blocks for each layer
  - Patterns of interaction between the building blocks and layers
- Will become prescriptive
  - Architectural Decisions
  - Realization decisions
  - Product Mapping guidance

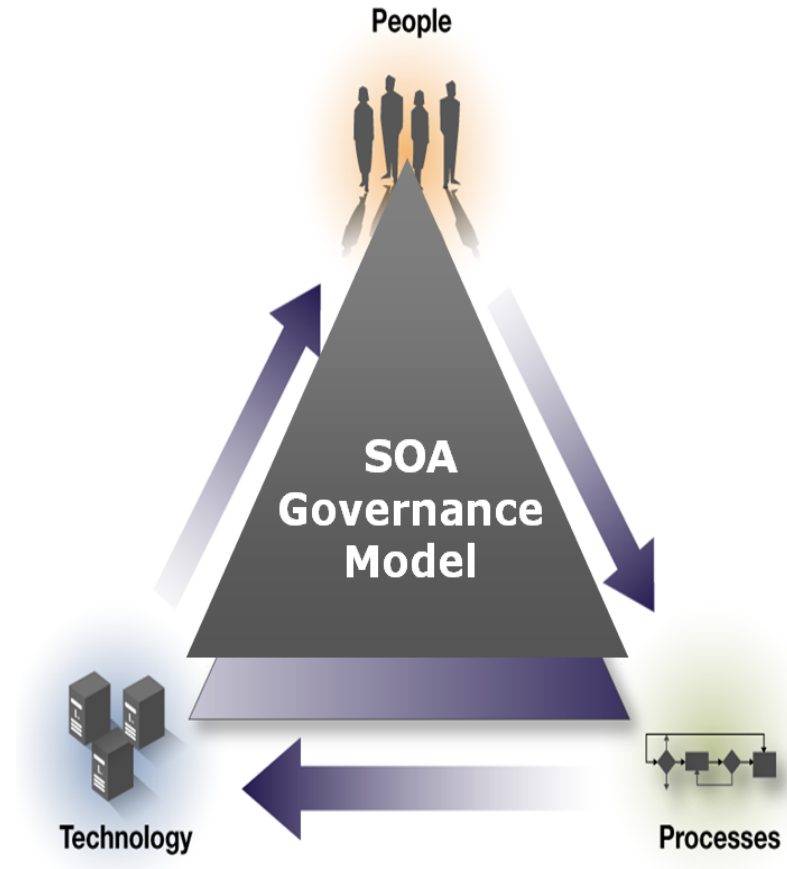THE Open GROUP

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SOA Governance

- Background
  - Governance widely recognized as crucial for SOA
- Objectives
  - Reference model and framework for SOA Governance
- Current State
  - Structure of document defined
  - > 90% of text drafted
- Next Steps
  - Progress and complete discussion of topics
  - Complete and review document

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SOA Governance Aspects

A comprehensive view of
SOA Governance includes:

- *People*
    - Organizational structures
    - Roles & Responsibilities

- *Processes*
    - Governing processes
    - Governed processes

- *Technology*
    - Tools
    - Infrastructure

Open Group SOA Governance Framework

SOA Governance Reference Model (SGRM)

Plan
Define
Implement
Monitor

SOA Governance Vitality Method (SGVM)

Customized and Focused SOA Governance Regimen

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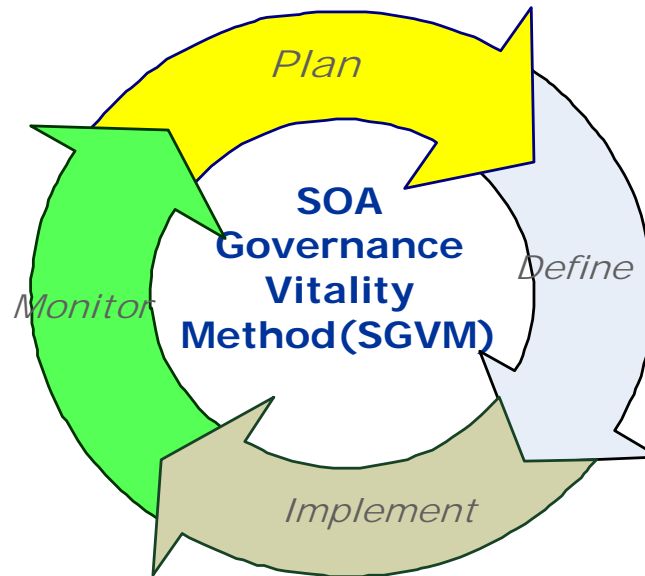
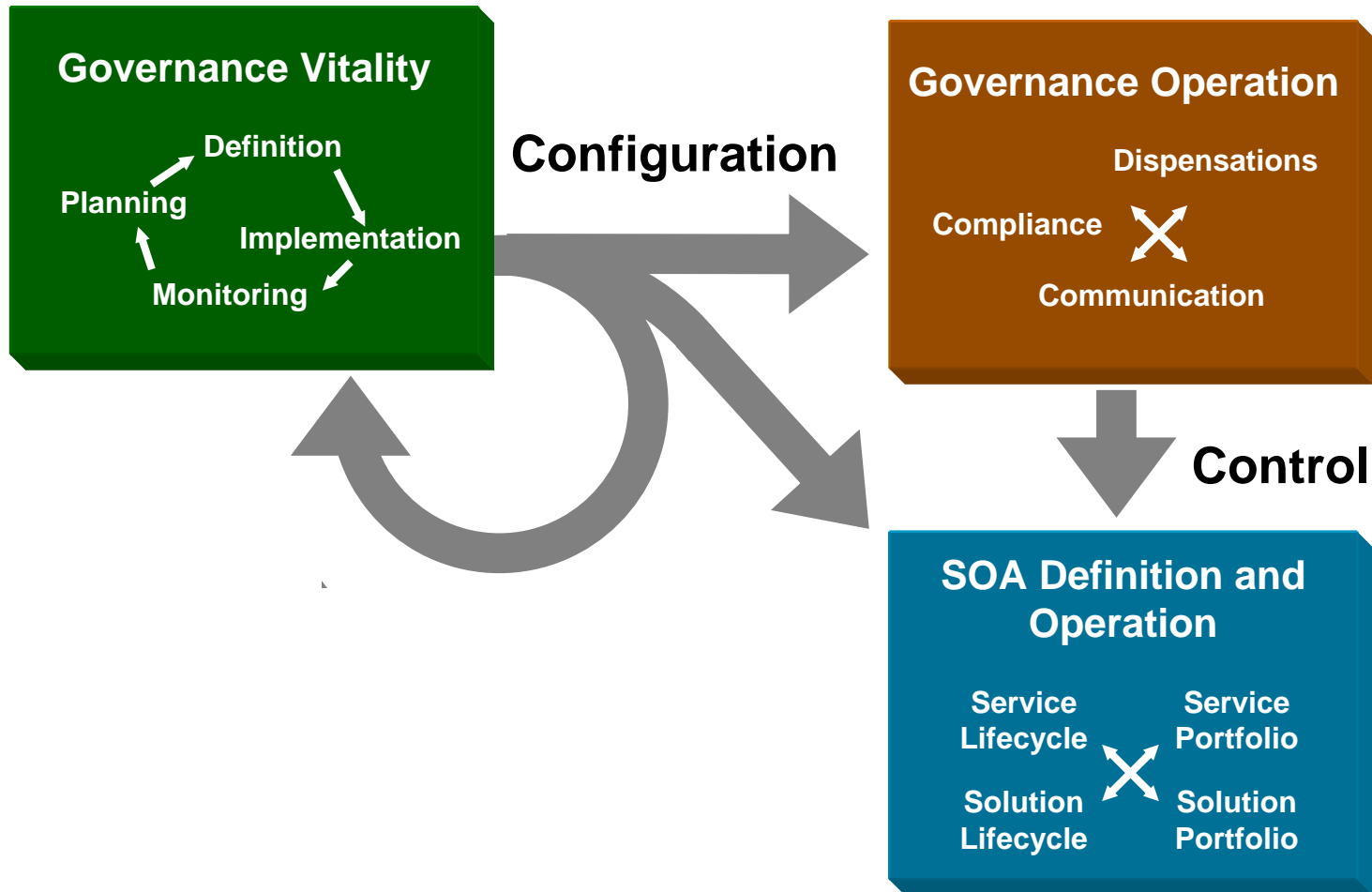# Processes of the Reference Model and Vitality Method

Governance Vitality

Definition

Planning

Implementation

Monitoring

Configuration

Governance Operation

Dispensations

Compliance

Communication

Control

SOA Definition and Operation

Service Lifecycle

Service Portfolio

Solution Lifecycle

Solution Portfolio

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The Open Group's SOA Work

Maturity Model

Business owner

Security

SOA/TOGAF Guide

System user

Product vendor

Ontology

System manager

Legacy Evolution

Architect

Developer

Product designer

Governance

Reference Architecture

Integrator

Service provider

Service-Oriented Infrastructure

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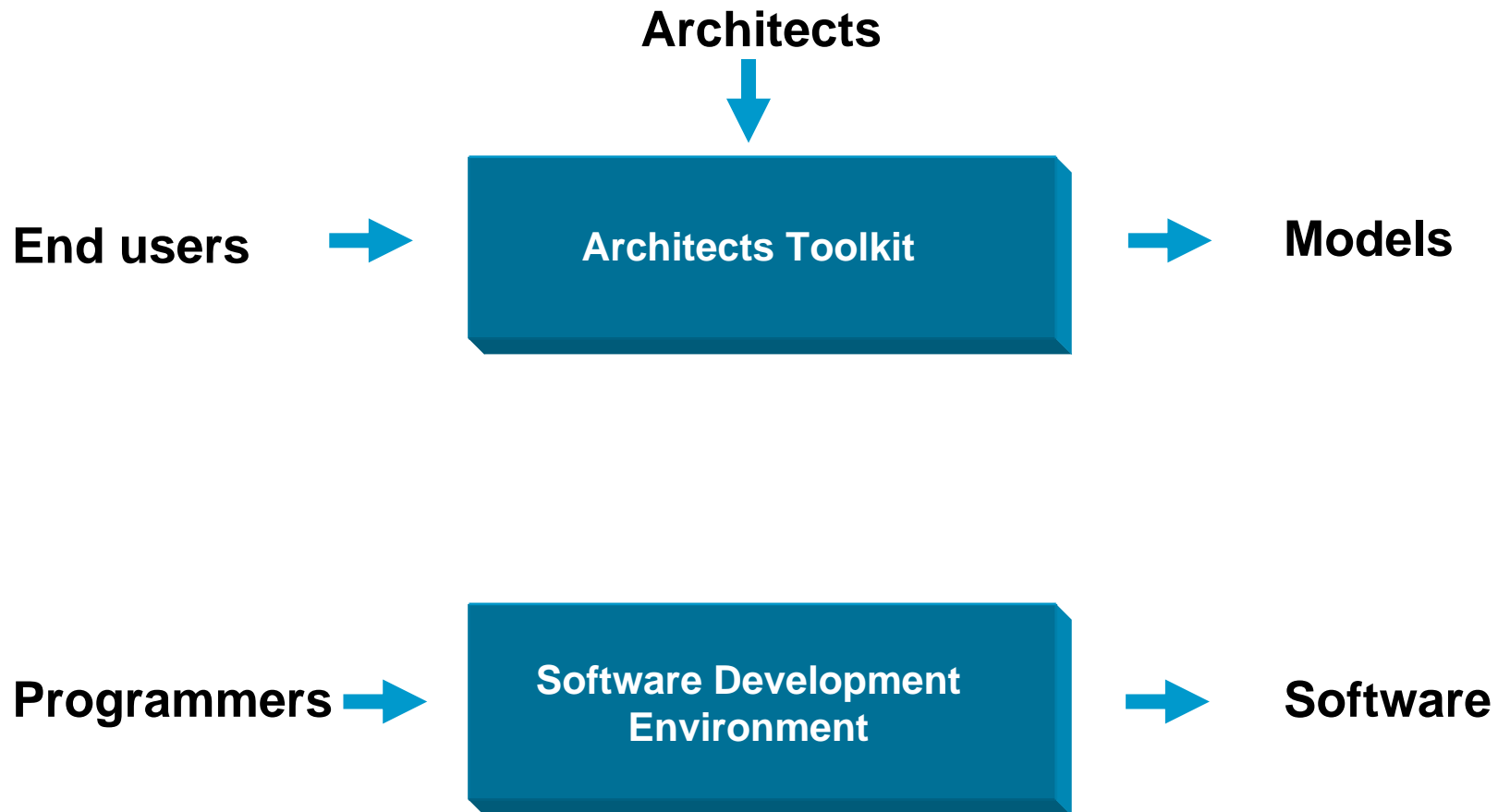
A Vision of the Future

Software is Getting Harder

Gigabytes

↑

Megabytes

↑

Kilobytes

↑

Bytes

Service

↑

Object

↑

Procedure

↑

Subroutine

Iterative

↑

Waterfall

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But Support is Improving

Architects

End users → **Architects Toolkit** → **Models**

Programmers → **Software Development Environment** → **Software**

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Enterprise Development Environment
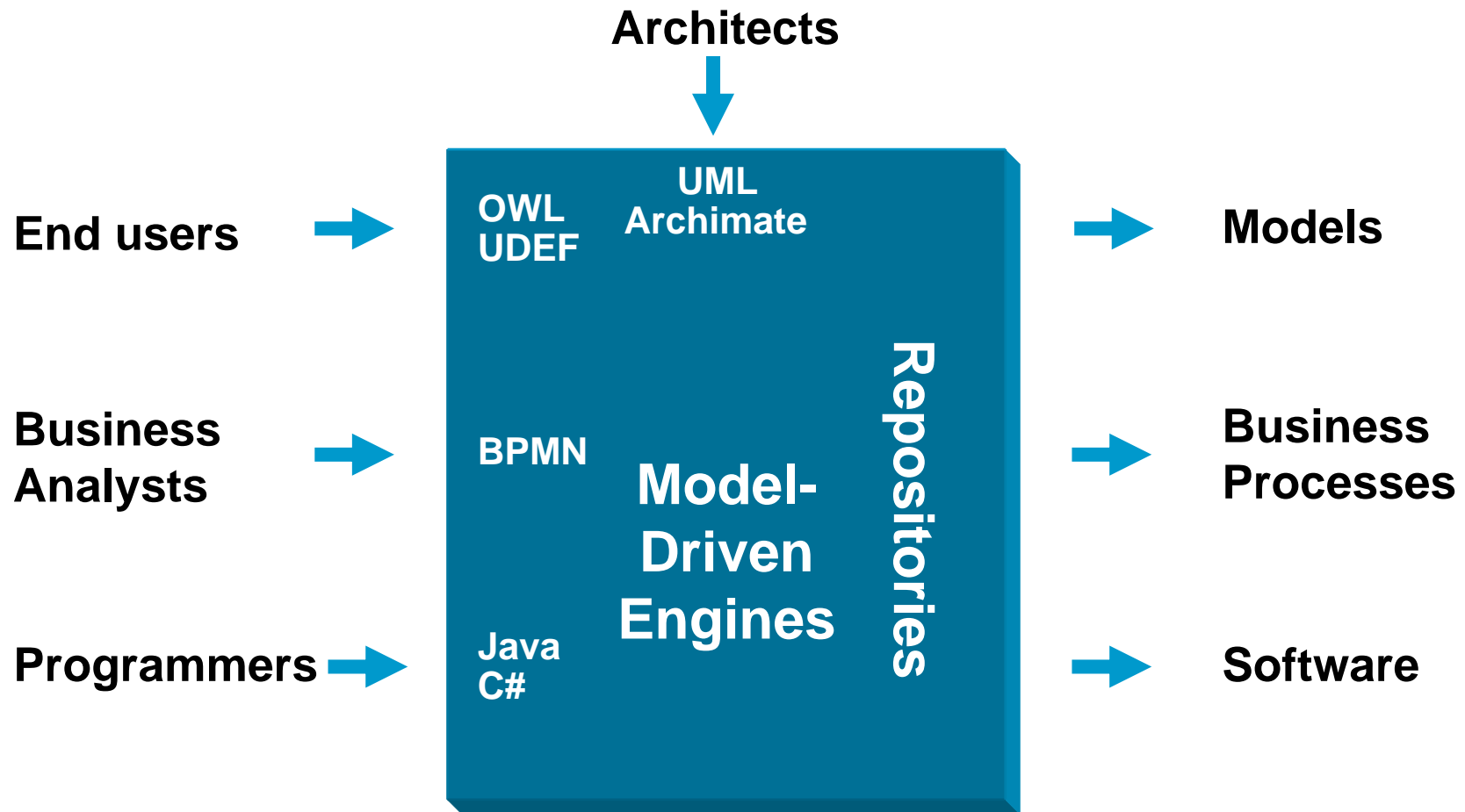
The Model-Driven Approach

Our Focus Today

OMG SoaML UML Profile

ModelPro (ModelDriven.org) Open Source MDA Tools

Implements

ModelPro Provisioning Engine

Uses

SoaML Cartridge for JEE

Automates

Uses

Users SOA Model

Provisioning Model
UML Tool

Provisioning Profile

Uses

Application

Deploy

Manual Platform Application Artifacts

Automated Platform Application & IDE Artifacts

Platform & Tools (E.G. Eclipse/Netbeans/.NET)

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The SOA Module

Architects

End users →

Description

Models →

Business Analysts →

Business Processes →

Programmers →

Prescription

Software →

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A Vision of the Future

Architects

End users → **Description** → Models

Business Analysts → Business Processes

Consumers
Business Processes
Services
Service Components
Operational Systems

Programmers → **Prescription** → Software

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The Value of Harmonization

- ❑ A SOA Reference Architecture will help architects and developers manage the complexity of SOA

- ❑ A standard SOA Reference Architecture will enable the development of a supporting environment

- ❑ Without which, SOA could fail

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Conclusions

❑ Each organization has a unique standpoint

■ The Open Group standpoint is centered on Enterprise Architecture

❑ There is overlap between the work of OASIS, the OMG, and The Open Group

■ Definition, ontology, reference architecture, governance

❑ Increasing system complexity means that architects and developers need a shared reference and support environment

■ Which will require harmonization of SOA concepts

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