Enterprise IT Architectures
SOA Part 3

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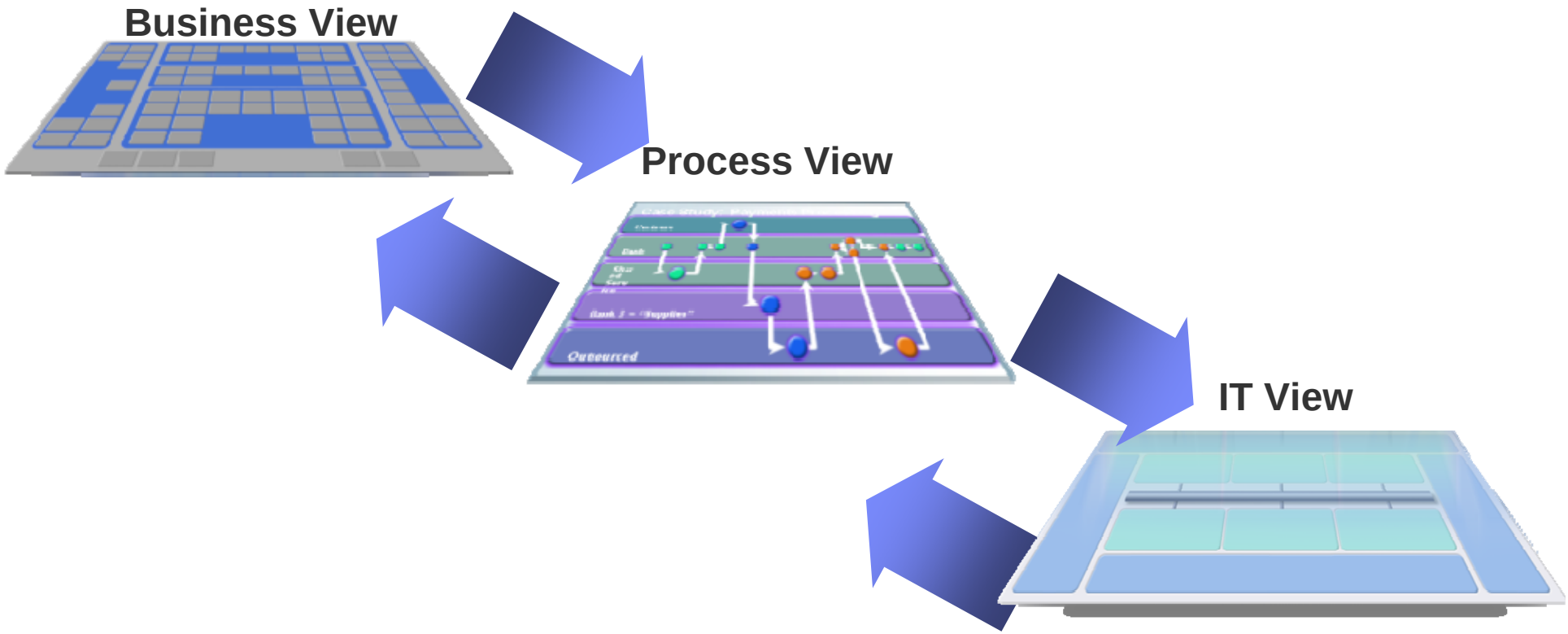
SOA drives Greater Alignment Between Business and IT creating an Enduring Impact on Industry



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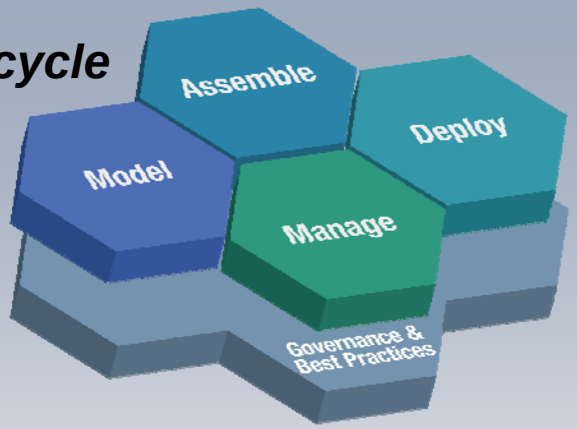
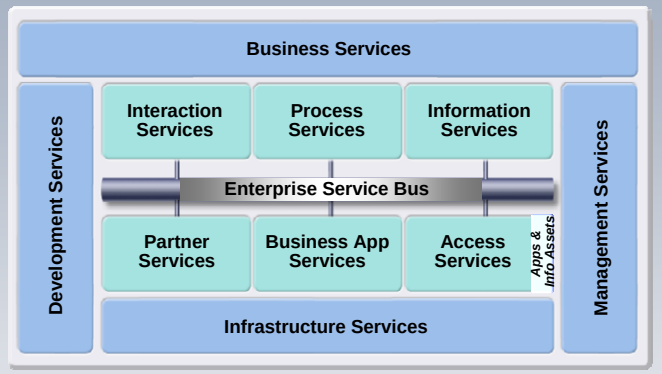
Key Models for SOA

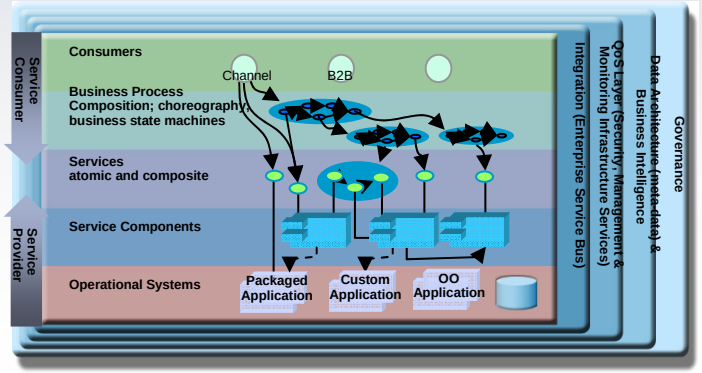
SOA Lifecycle



SOA Reference Architecture



SOA Solution Layering



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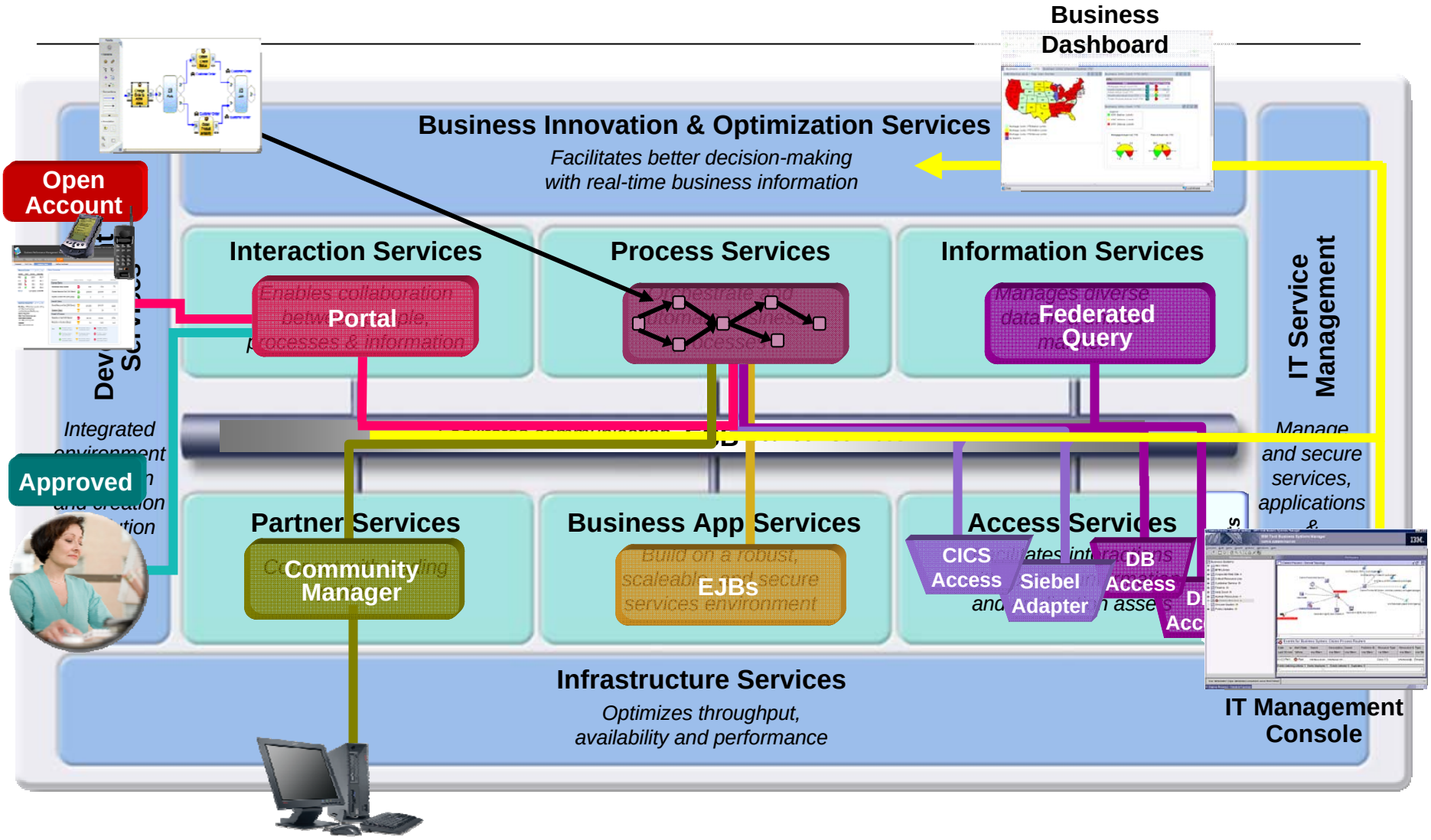
Reference Architecture and "Open Account" Process



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Agenda

I. Identification and Specification of Services

II. Business Architecture through CBM
(Component Business Modeling)

III. Governance

IV. More about Case FACT

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I. Identification and Specification of Services

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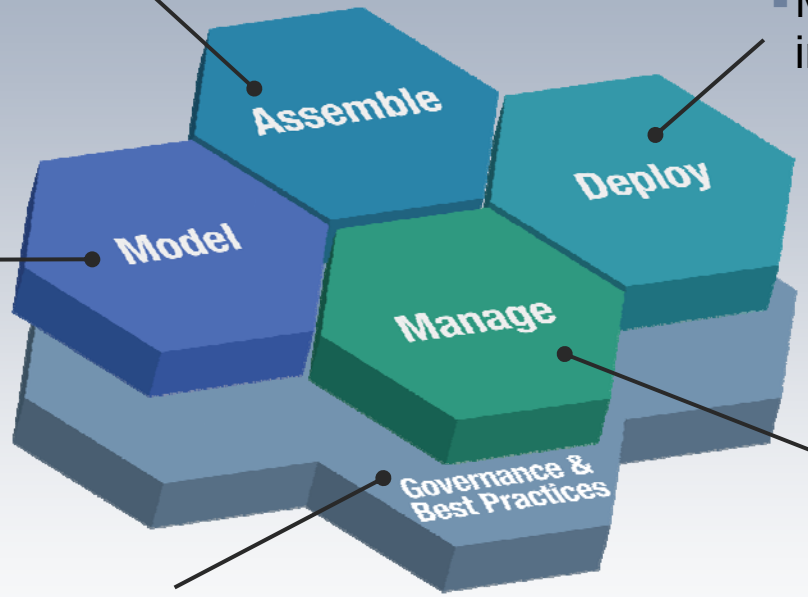
Method Background: The SOA Lifecycle

- Discover
- Construct & Test
- Compose

- Integrate people
- Integrate processes
- Manage and integrate information



- Gather requirements
- Model & Simulate
- Design

- Manage applications & services
- Manage identity & compliance
- Monitor business metrics

- Financial transparency
- Business/IT alignment
- Process control

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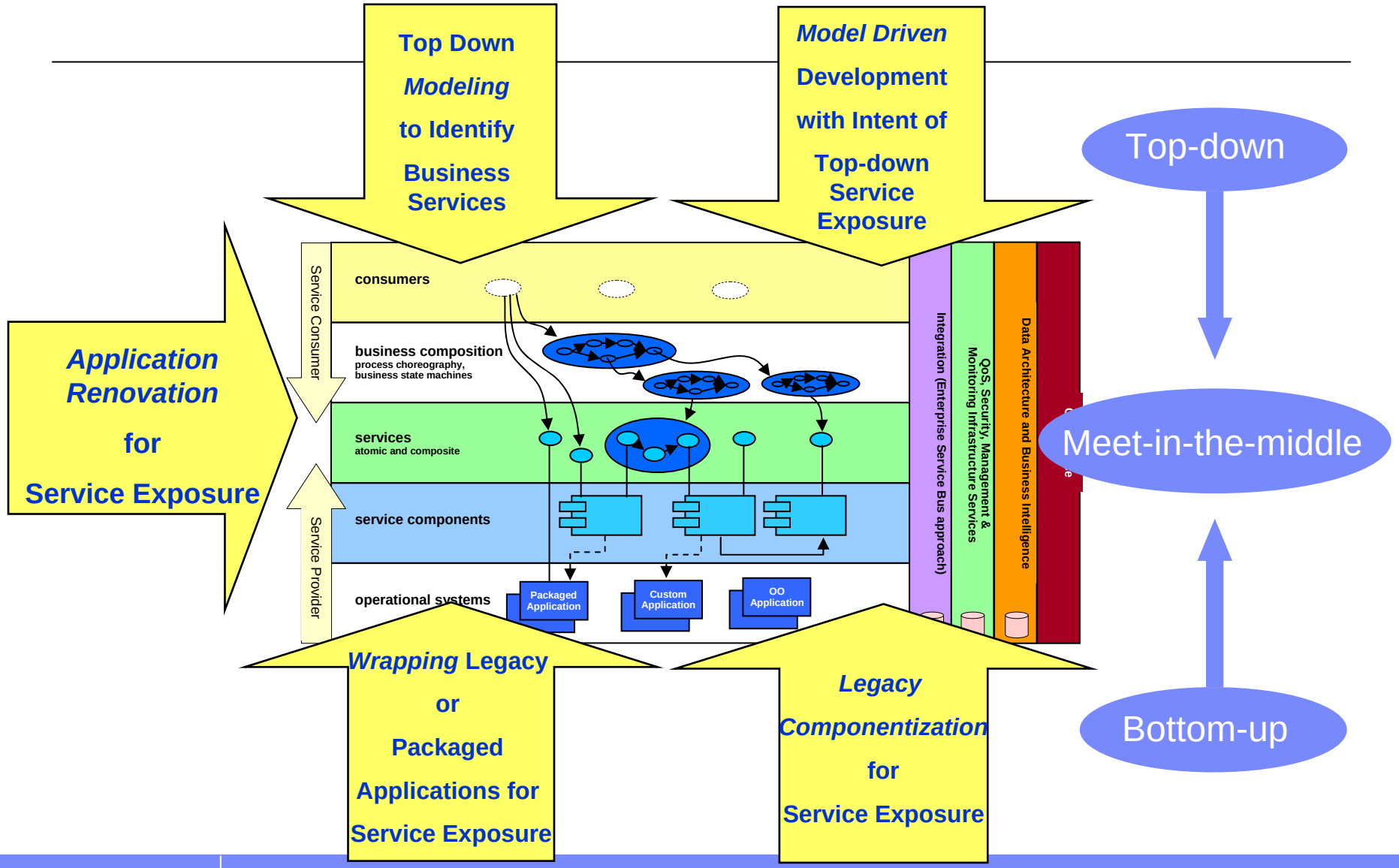
How: Approaches to SOA Solutions



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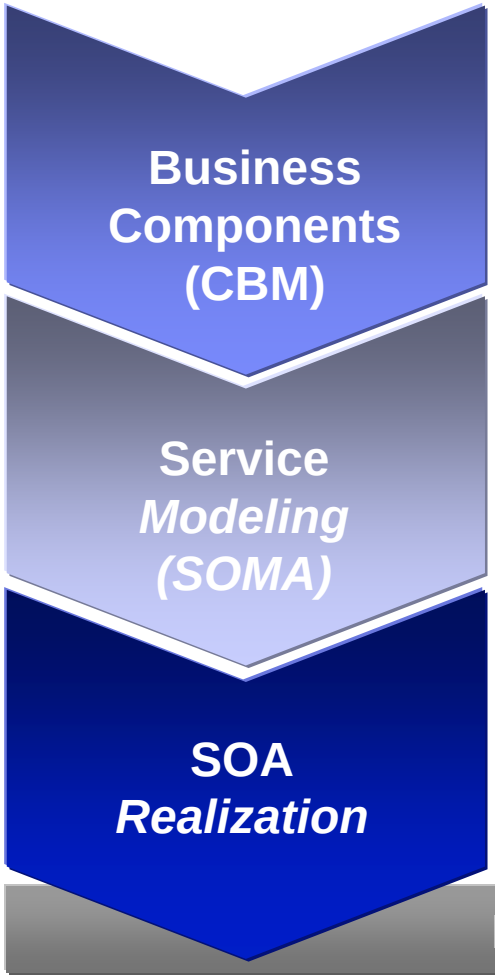
Best implementations start with business design or a master plan



Step 1: Break down your business into components

- Decide what is strategically important, and what is just operations in the value chain domains
- Analyze the different KPIs attached to these components
- Prioritize and scope your transformation projects

Step 2: Define a Service Model

- Identify your services based on your business components
- Specify the services and components accordingly
- *Make SOA realization decisions based on architectural decisions*

Step 3: Implement a Service Model

- Develop a service-oriented architecture to support the Componentized Business
- Implement service based scoping policy for projects
- Implement appropriate governance mechanism

Business-Aligned IT Architecture

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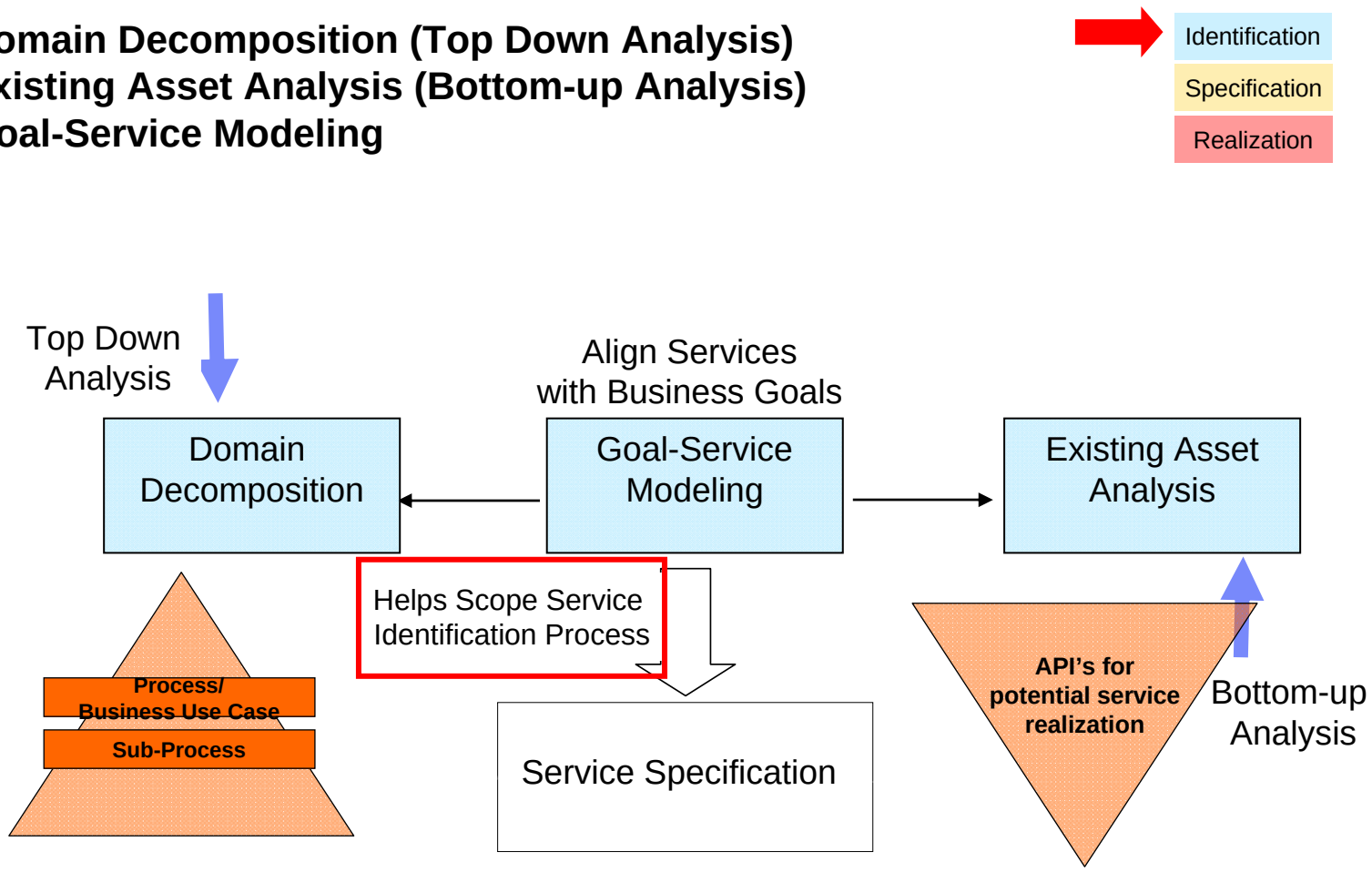
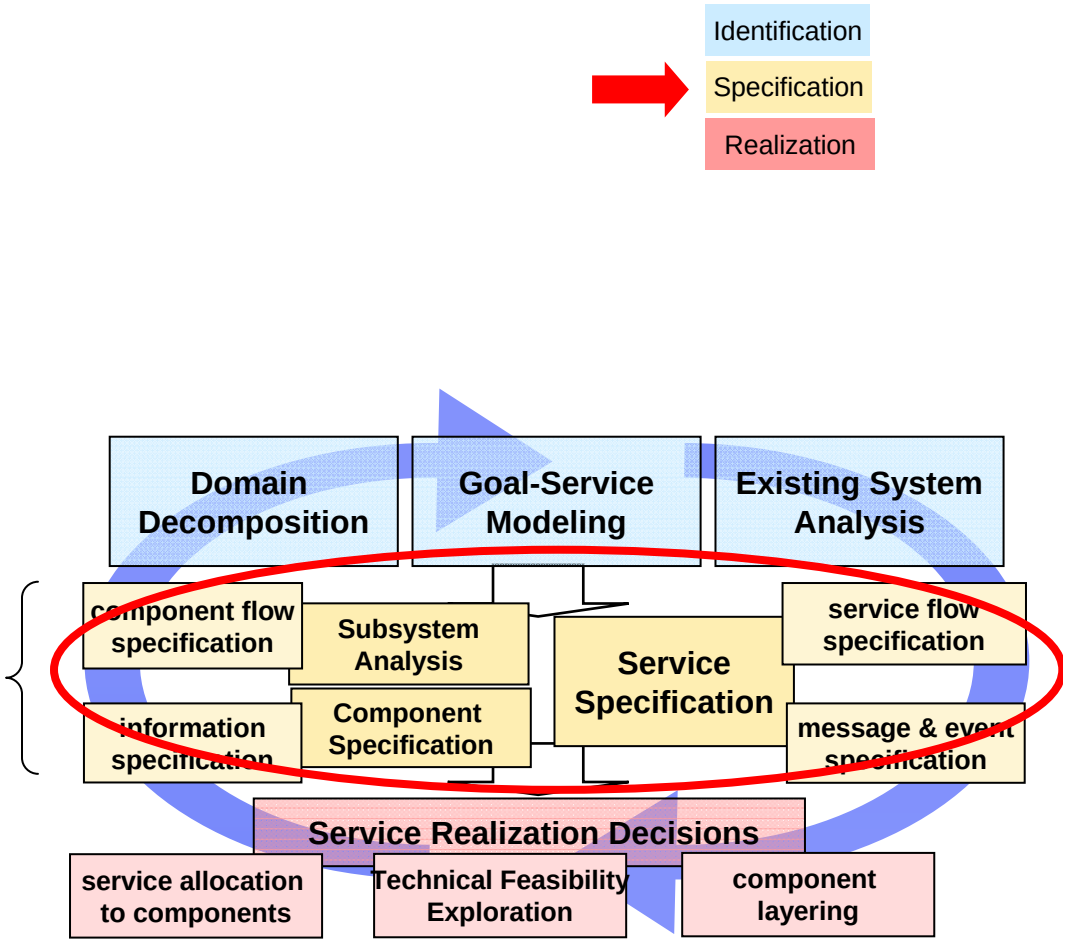
SOMA (Service-Oriented Modeling and Architecture) identifies services through three complementary techniques

- **Domain Decomposition (Top Down Analysis)**
- **Existing Asset Analysis (Bottom-up Analysis)**
- **Goal-Service Modeling**



SOMA Specification uses multiple techniques to select services for exposure, to specify flows, services and services components that realize them

- Service Specification
  - Elaborates the *Service Model*, Includes **Service Litmus Test** that “gate” service exposure decisions
- Subsystem Analysis
  - Partitioning into service components that will be responsible for service realization
- Component Specification
  - Detailed component modeling, flow, information architecture, messages



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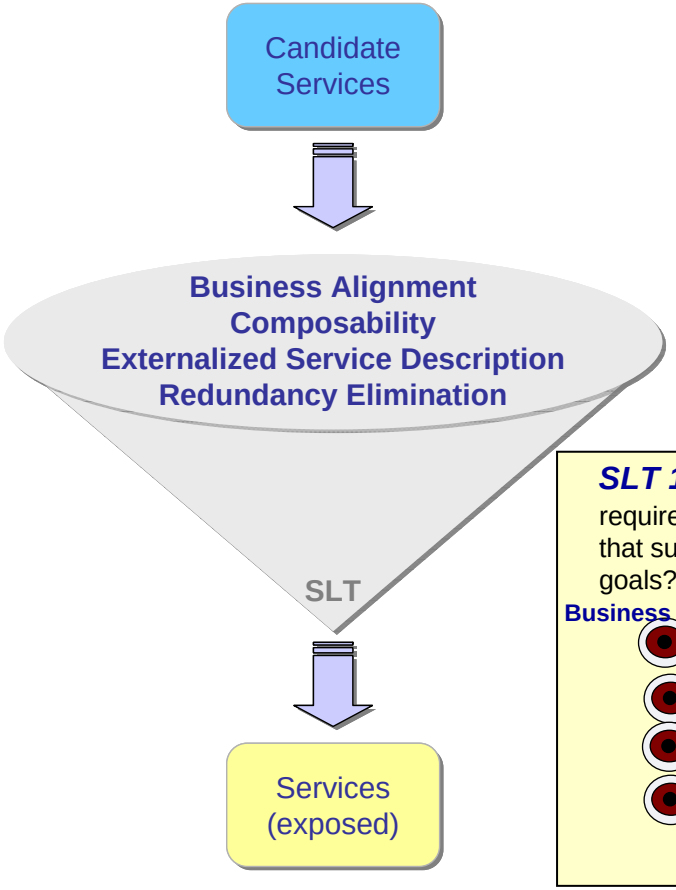
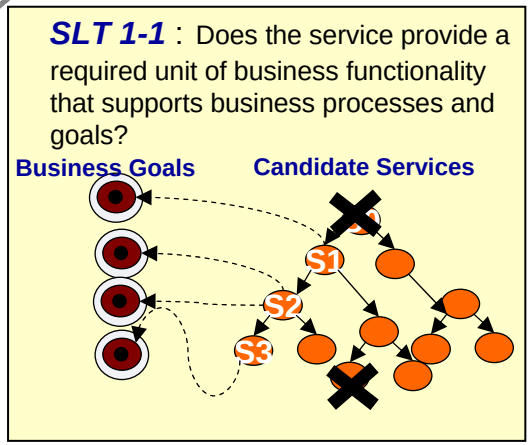
Service Litmus Test: During the Service Specification we make service exposure decisions

- "From all the candidate services, which ones should we expose?"
- Not all candidate services should be exposed
- Every implemented service has costs and risks
- "**Service Litmus Test**" helps make exposure decisions





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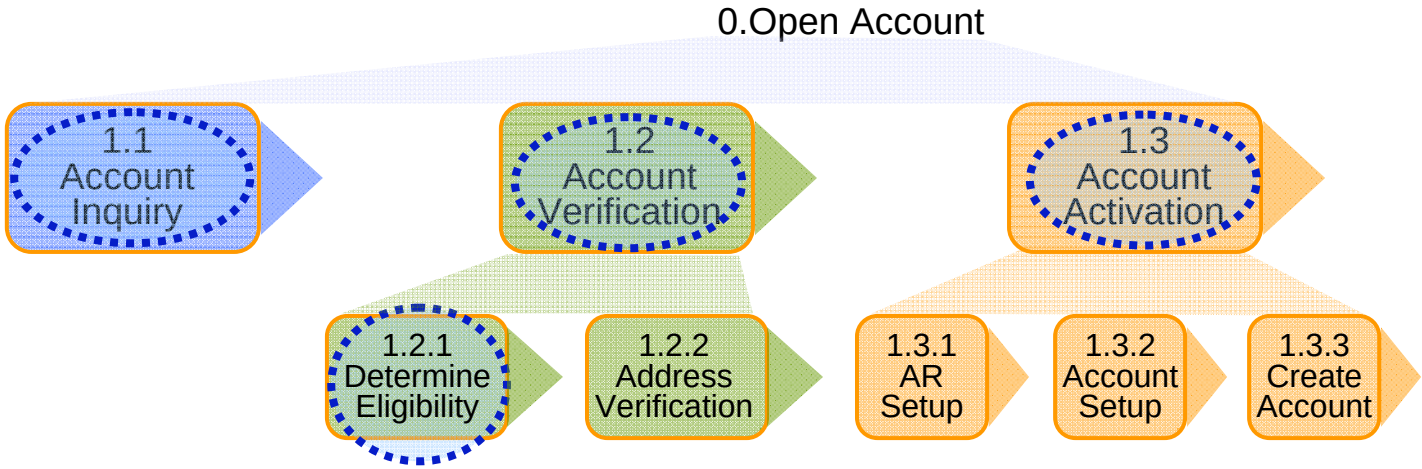
JK Enterprises Service Exposure Decisions



EXAMPLE
For illustration only

Legend
= Service to be exposed

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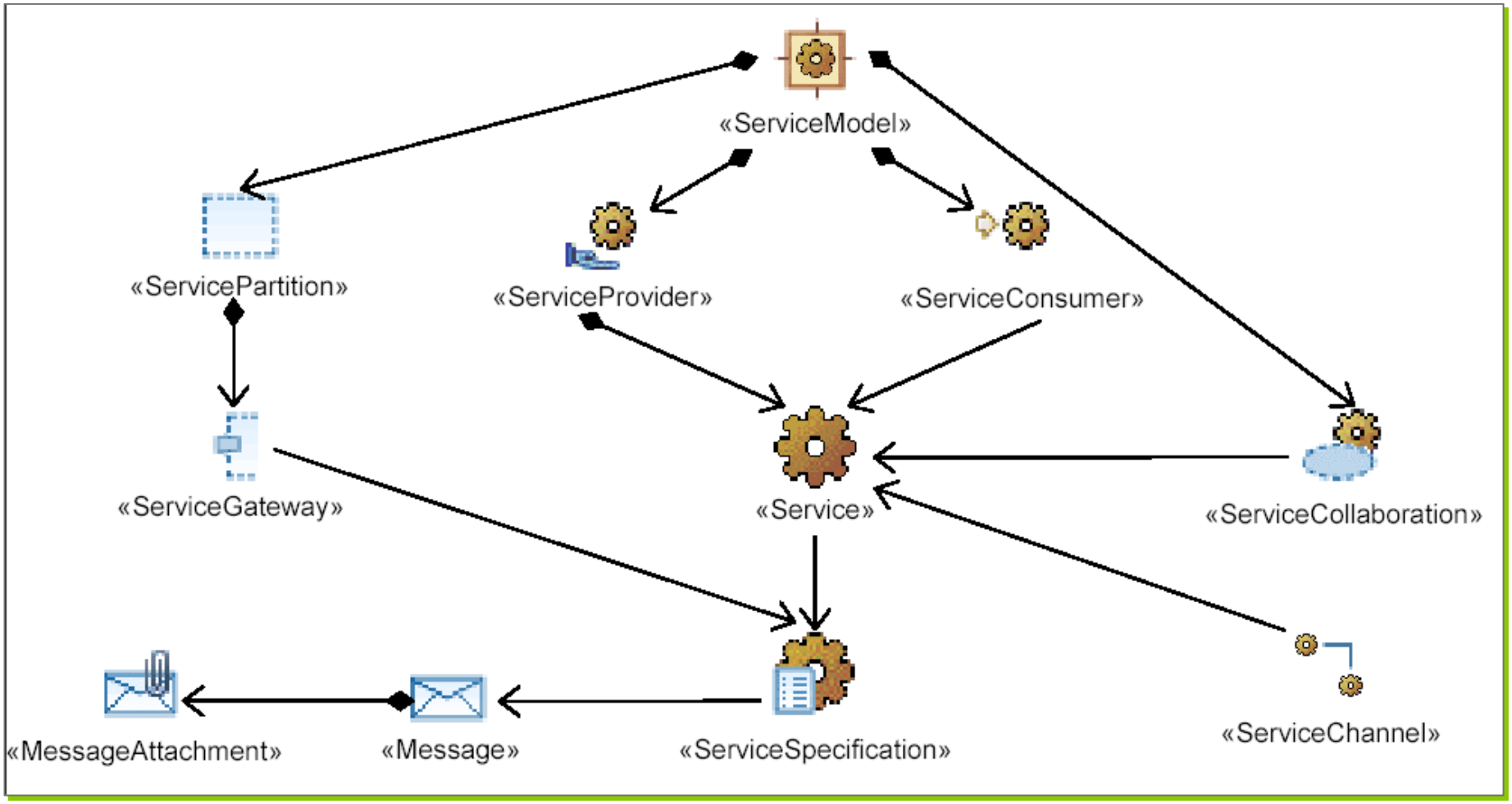
UML 2 Profile for Software Services Elements



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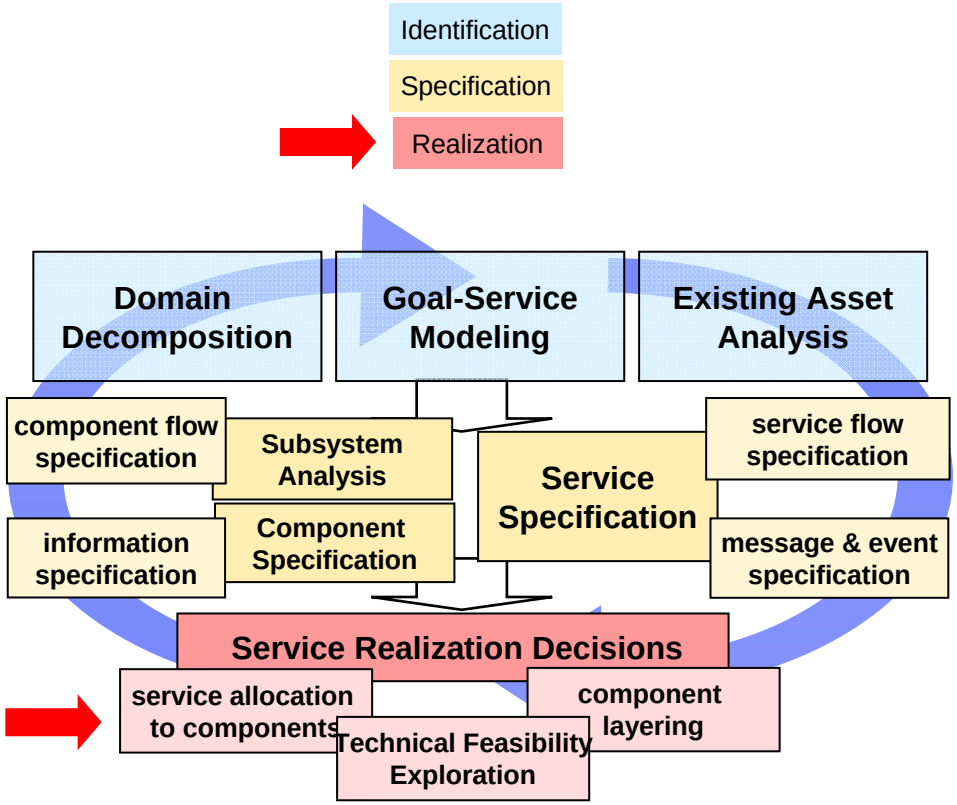
SOMA Service Realization Step

- **Component Layering**
  - **Allocation of component to the application architecture layers**
- **Allocation of services to service components**
- **Technical Feasibility Exploration**
- **Realization Decisions with Justifications**



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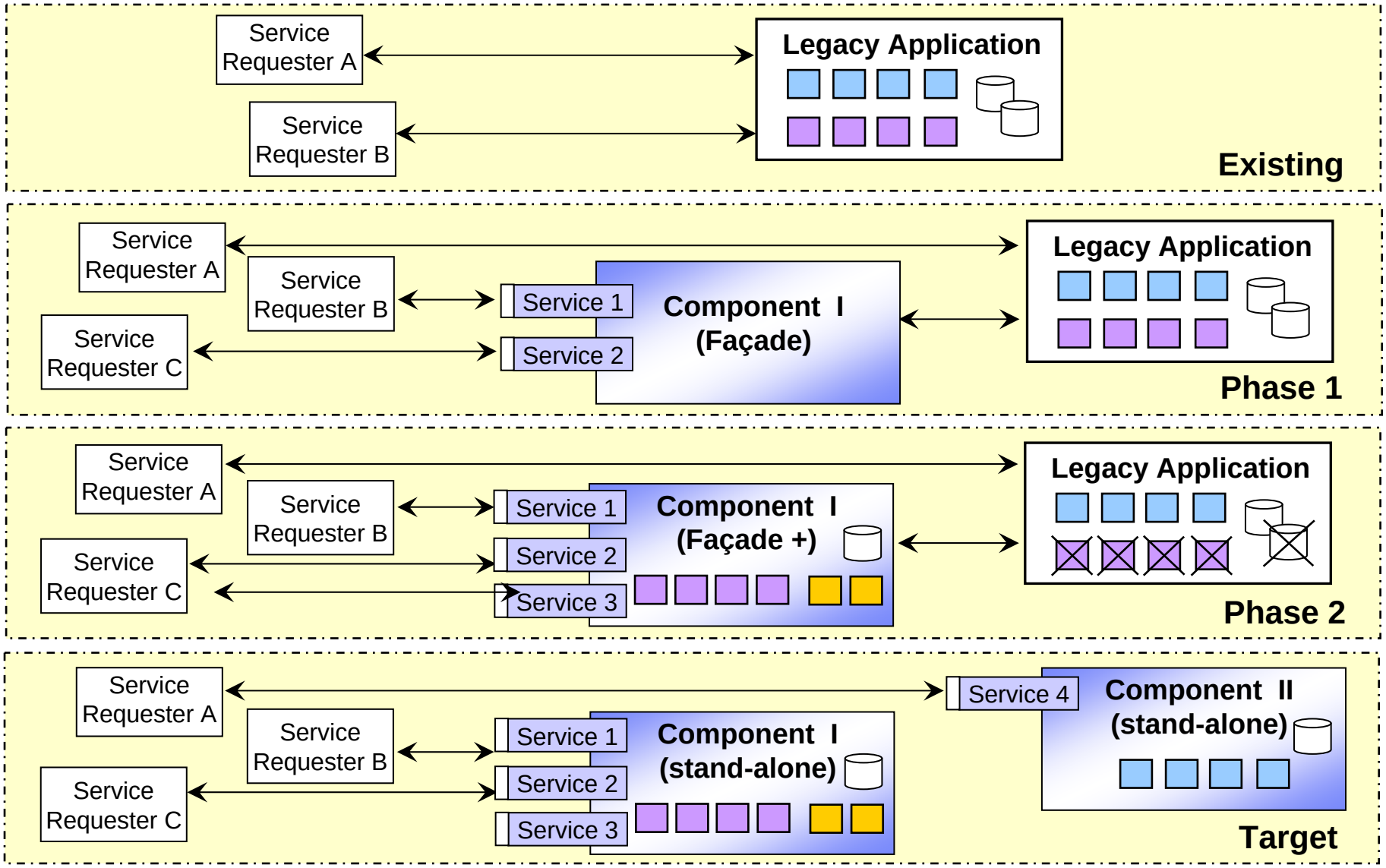
Legacy Migration Example



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Positioning of Portal as general User Interface

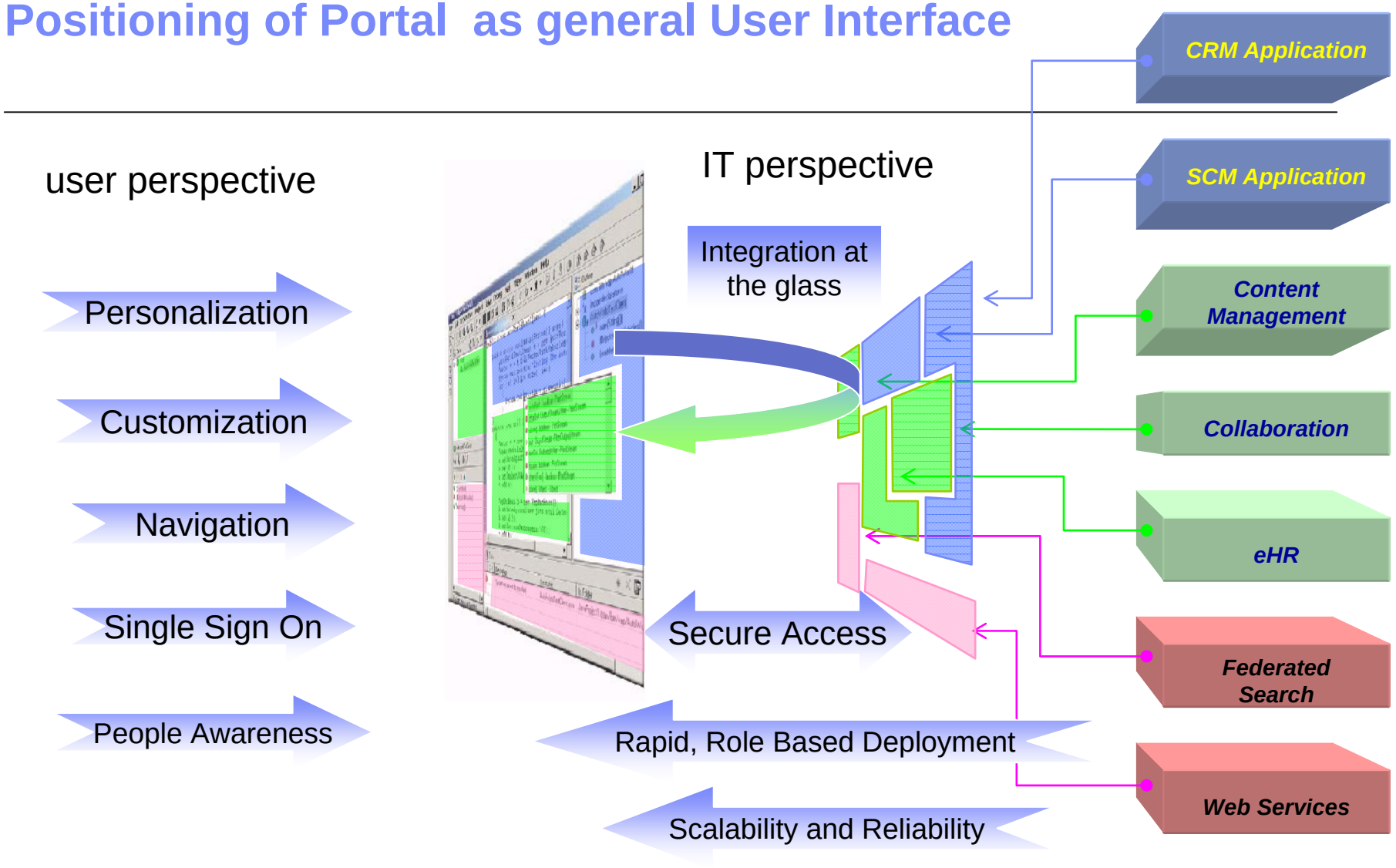

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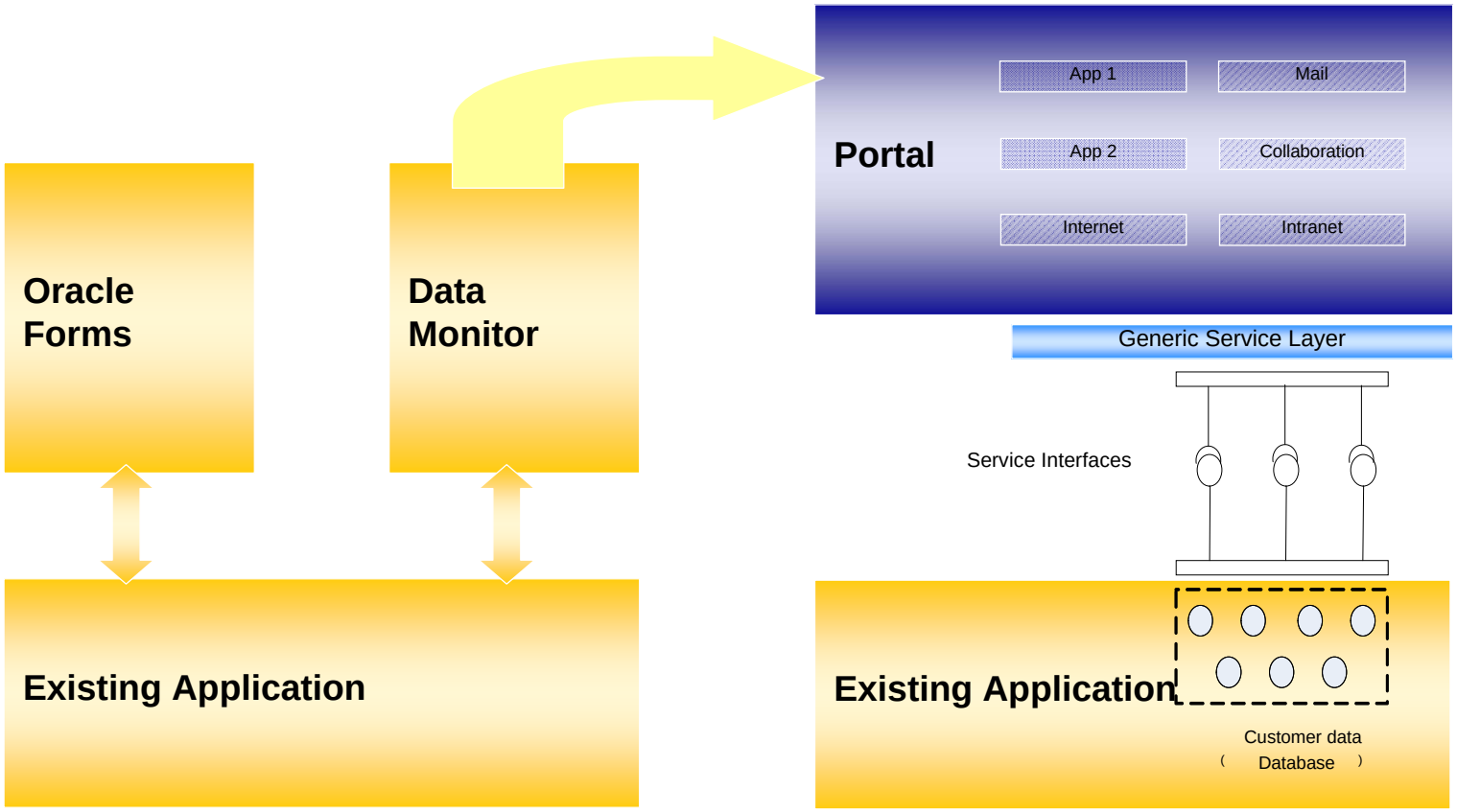
Illustration of an Portal Implementation



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II. Business Architecture through CBM (Component Business Modeling)

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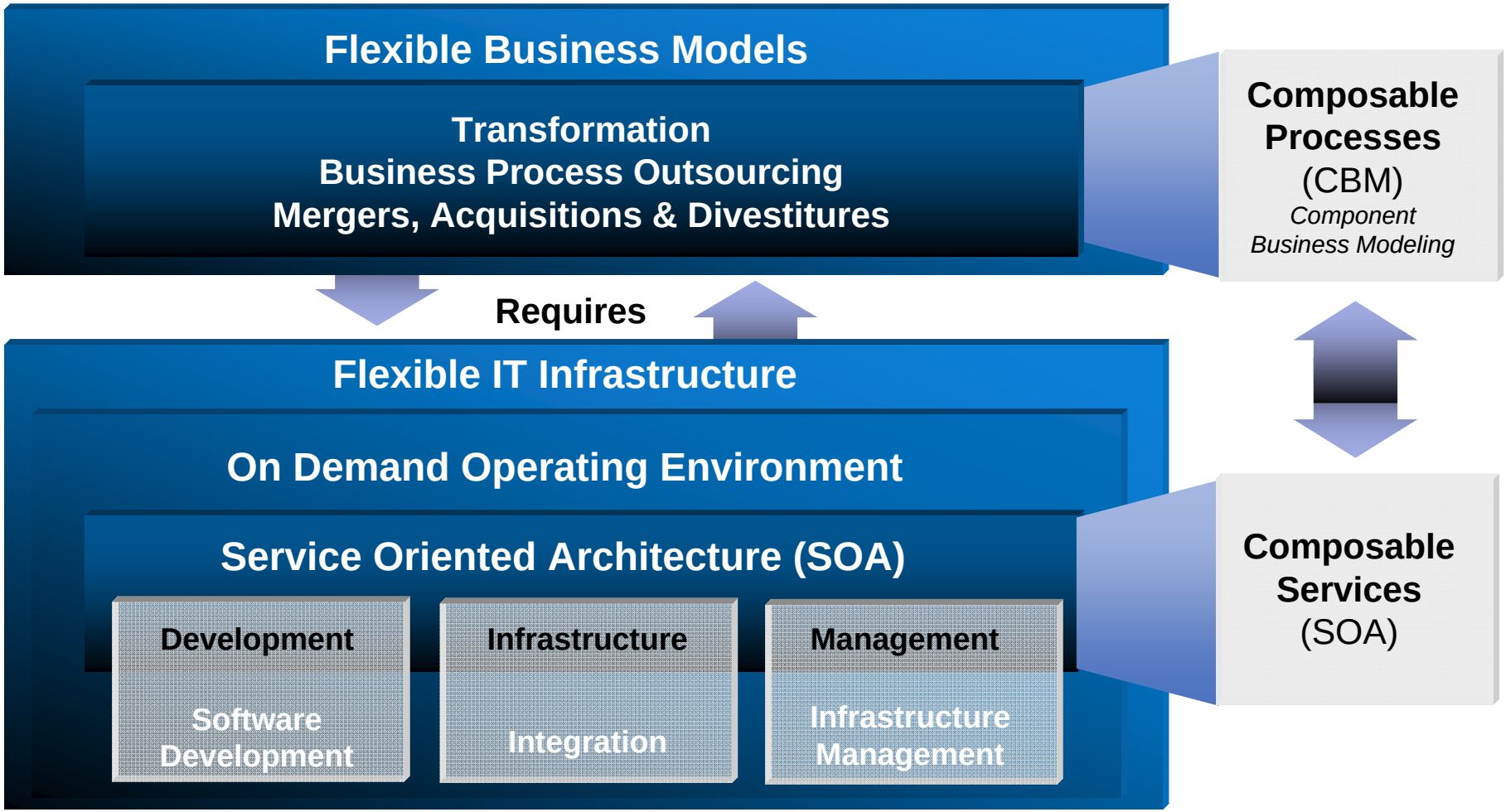
Greater Flexibility Is Required

From Business Models and the Supporting IT Architecture



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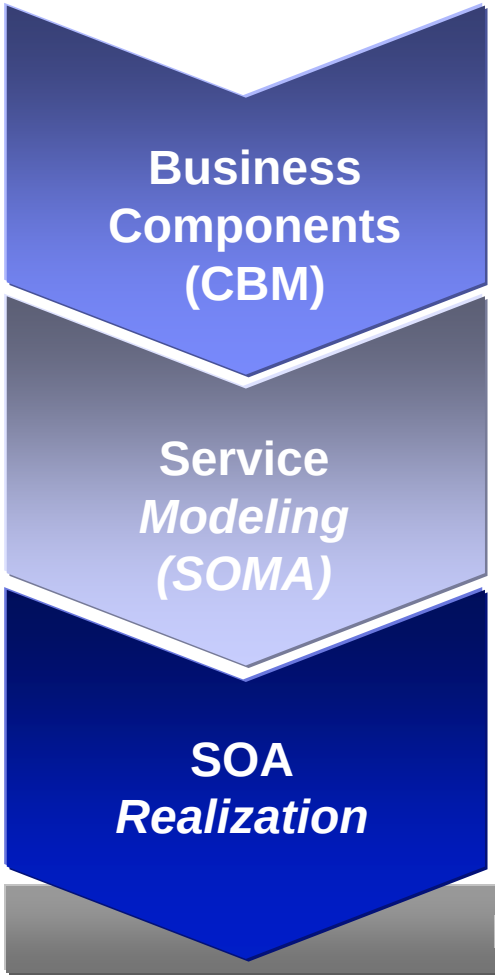
Best implementations start with business design or a master plan – approach for SOA



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Business-Aligned IT Architecture

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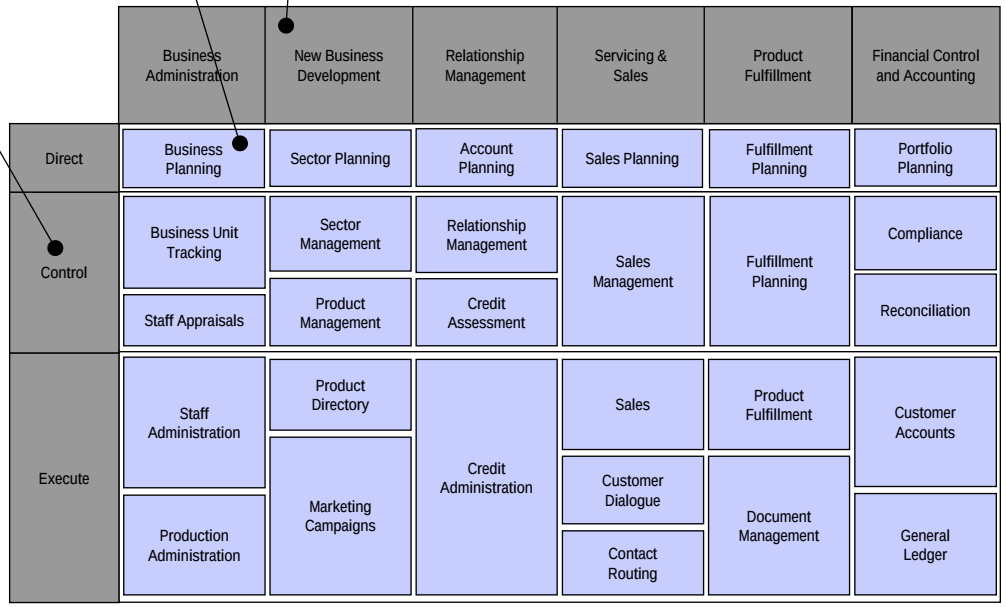
Component Business Model (CBM)

A **Business Component** is a part of an enterprise that has the potential to operate autonomously, for example, as a separate company, or as part of another company.

Columns are Business Competencies, defined as large business areas with characteristic skills and capabilities, for example, product development or supply chain.

An **Operational Level** characterizes the scope of decision making. The three levels used in CBM are direct, control and execute.

- Direct is about strategy, overall direction and policy.
- Control is about monitoring, managing exceptions and tactical decision making
- Execute is about doing the work



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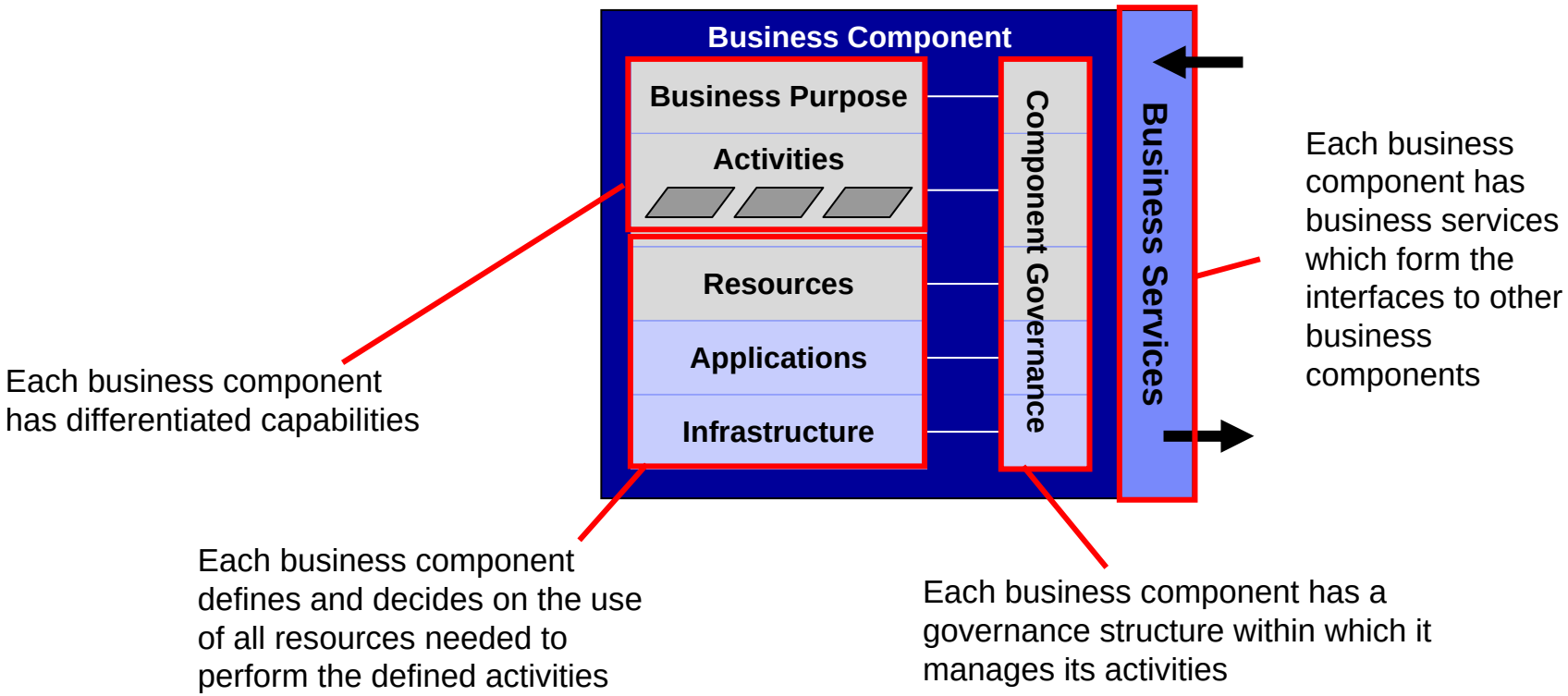
The building block of a component business model is a 'business component'

A component is a business in microcosm. It has activities, resources, applications, infrastructure. It has a governance model. It provides goods and services (business services)

Business Component Elements



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Deconstruct & Conquer: *The Component Business Model*

1 2 3 4 First, break down your business into its components

Example: Consumer Packaged Goods

	Product Management	Customer Relationship	Manufacturing	Supply Chain & Distribution	Business Administration
Strategy	Category/Brand Strategy Category/Brand Planning	Customer Relationship Strategy Customer Relationship Planning	Manufacturing Strategy Supplier Relationship Management Production and Materials Planning	Supply Chain Strategy Supply Chain Planning	Corporate Strategy Corporate Planning Alliance Management Line of Business Planning
Tactics	Brand P&L Management Matching Supply and Demand Marketing Development & Effectiveness Product Ideation	Assessing Customer Satisfaction Customer Insights Account Management	Manufacturing Oversight Supplier Control	Distribution Oversight Inbound Logistics Outbound Logistics	Business Performance Management External Market Analysis Organization and Process Design Legal and Regulatory Compliance
Execution	Concept/Product Testing Product Development Product Management Marketing Execution Consumer Service Product Directory	Value-Added Services Customer Account Servicing Retail Marketing Execution In-store Inventory Mgmt Customer Directory	Make Products Assemble/Pkg. Products Plant Inventory Management Manufacturing Procurement	Distribution Center Operations Transportation Resources En Route Inventory Management	Treasury and Risk Management Accounting and GL Indirect Procurement Facilities and Equipment Management HR Administration IT Systems and Operations

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Deconstruct & Conquer: *The Component Business Model*

1 2 3 4 Next, decide what's differentiating and what is simply operating

Example: Consumer Packaged Goods

Strategic View

- **Strategic differentiation**
- **Competitive parity**
- **Basic**

	Product Management	Customer Relationship	Manufacturing	Supply Chain & Distribution	Business Administration
Strategy	Category/Brand Strategy	Customer Relationship Strategy	Manufacturing Strategy	Supply Chain Strategy	Corporate Strategy
	Category/Brand Planning	Customer Relationship Planning	Supplier Relationship Management	Supply Chain Planning	Corporate Planning
			Production and Materials Planning		Alliance Management
					Line of Business Planning
Tactics	Brand P&L Management	Assessing Customer Satisfaction		Distribution Oversight	Business Performance Management
	Matching Supply and Demand	Customer Insights	Manufacturing Oversight	Inbound Logistics / Outbound Logistics	External Market Analysis
	Marketing Development & Effectiveness	Account Management			Organization and Process Design
	Product Ideation		Supplier Control		Legal and Regulatory Compliance
Execution	Concept/Product Testing	Value-Added Services	Make Products		Treasury and Risk Management
	Product Development	Customer Account Servicing	Assemble/Pkg. Products	Distribution Center Operations	Accounting and GL
	Product Management	Retail Marketing Execution	Plant Inventory Management		Indirect Procurement
	Marketing Execution	In-store Inventory Mgmt		Transportation Resources	Facilities and Equipment Management
	Consumer Service		Manufacturing Procurement		HR Administration
	Product Directory	Customer Directory		En Route Inventory Management	IT Systems and Operations

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Deconstruct & Conquer: *The Component Business Model*

1 2 3 4 Then, analyze costs

Example: Consumer Packaged Goods

Financial View

- **High capital area**
- **High cost area**
- **High cost & capital area**

	Product Management	Customer Relationship	Manufacturing	Supply Chain & Distribution	Business Administration
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Deconstruct & Conquer: *The Component Business Model*

1 2 3 4 Finally, prioritize your transformation initiatives

Example: Consumer Packaged Goods

Transformational View

- **Seek external provider / external utility**
- **Consolidate and/or create internal utility**
- **Integrate and redesign**
- **No action**

	Product Management	Customer Relationship	Manufacturing	Supply Chain & Distribution	Business Administration
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III. Governance

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What is Governance?

Establishing chains of responsibility, authority and communication to **empower** people (decision rights)

Establishing measurement, policy and control mechanisms to **enable** people to carry out their roles and responsibilities

- Corporate Governance
- IT Governance
- EA Governance
- SOA Governance

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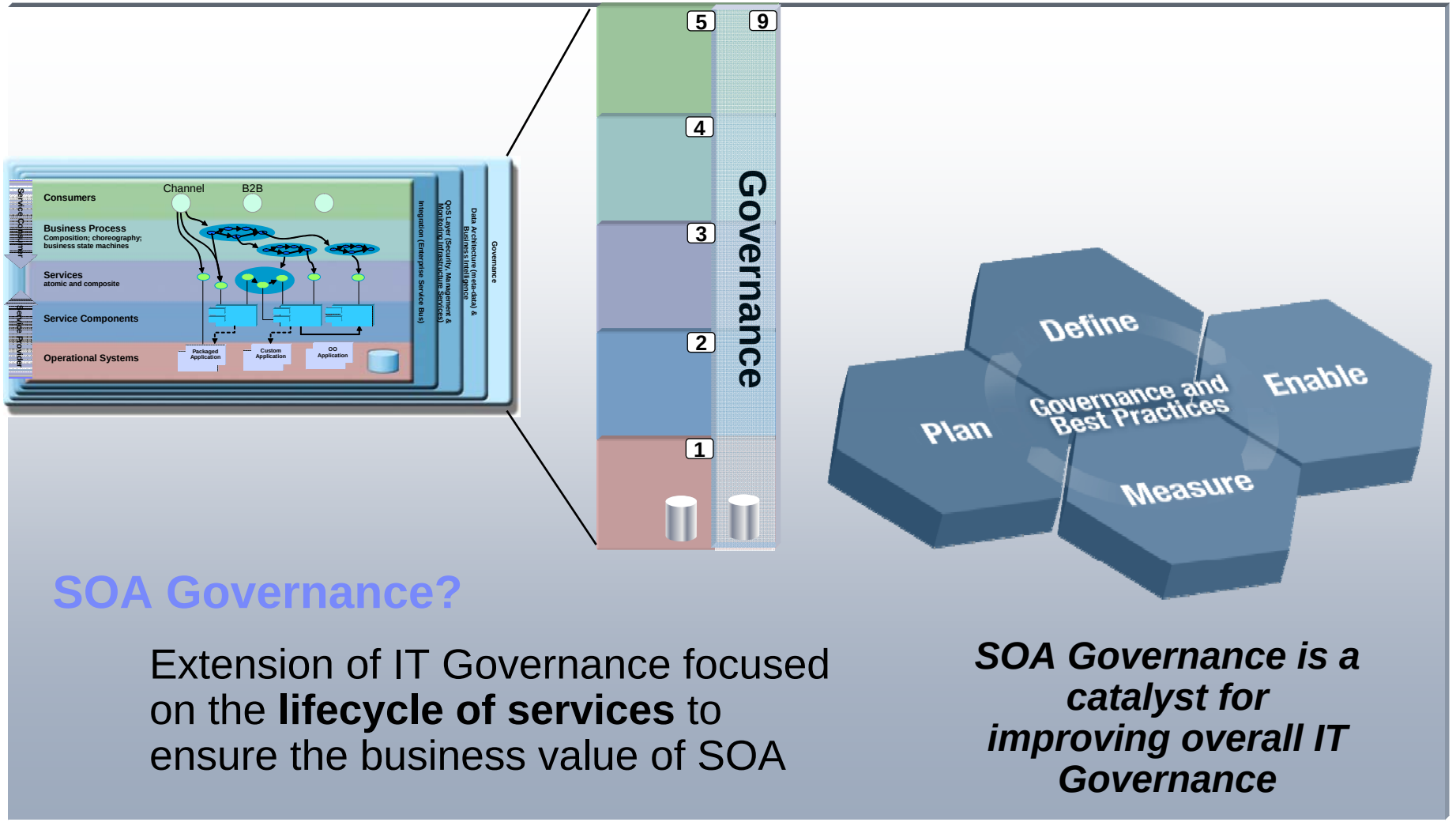
What is SOA Governance?



SOA Governance?

Extension of IT Governance focused on the **lifecycle of services** to ensure the business value of SOA

SOA Governance is a catalyst for improving overall IT Governance

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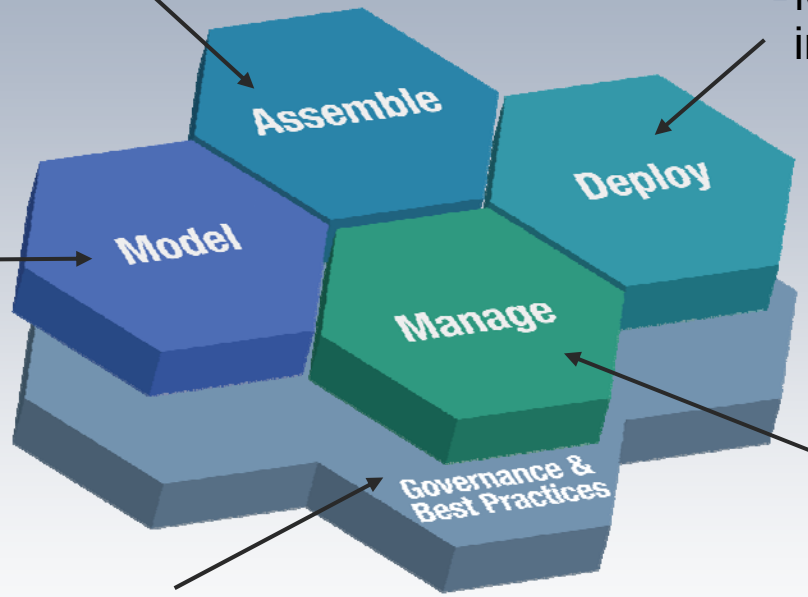
Governance within the SOA Lifecycle – Managing the Service Portfolio

- Discover
- Construct & Test
- Compose

- Integrate people
- Integrate processes
- Manage and integrate information



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- Model & Simulate
- Design

- Manage applications & services
- Manage identity & compliance
- Monitor business metrics

- **Financial transparency**
- **Business/IT alignment**
- **Process control**

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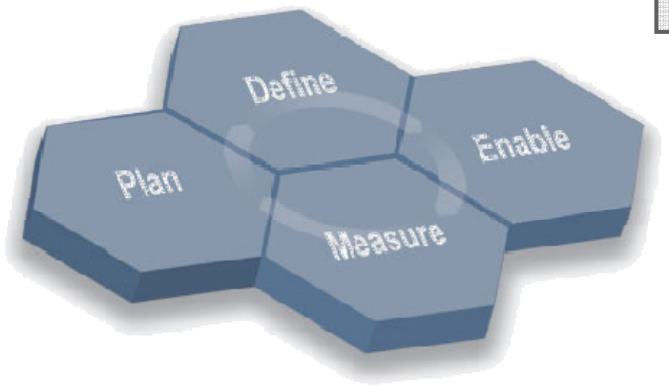
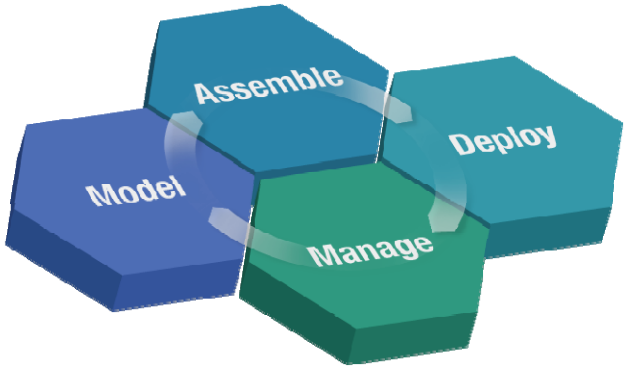
SOA Governance Definition and Enforcement



SOA Governance Lifecycle

- the process in which SOA Governance is defined



SOA Service Lifecycle

- the processes being governed
- the processes in which SOA Governance is enforced

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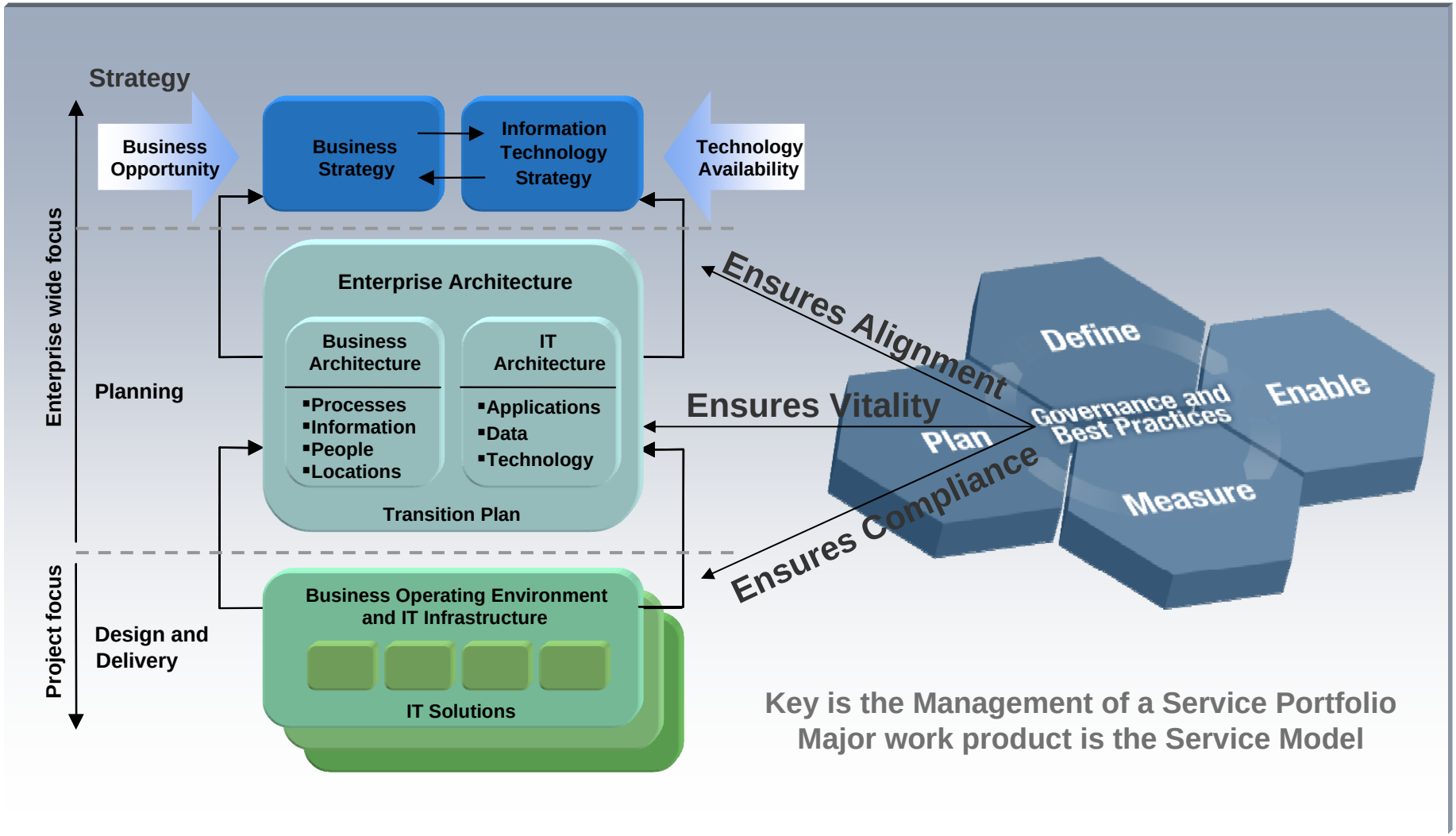
Enterprise wide SOA Governance (Enterprise Architecture)



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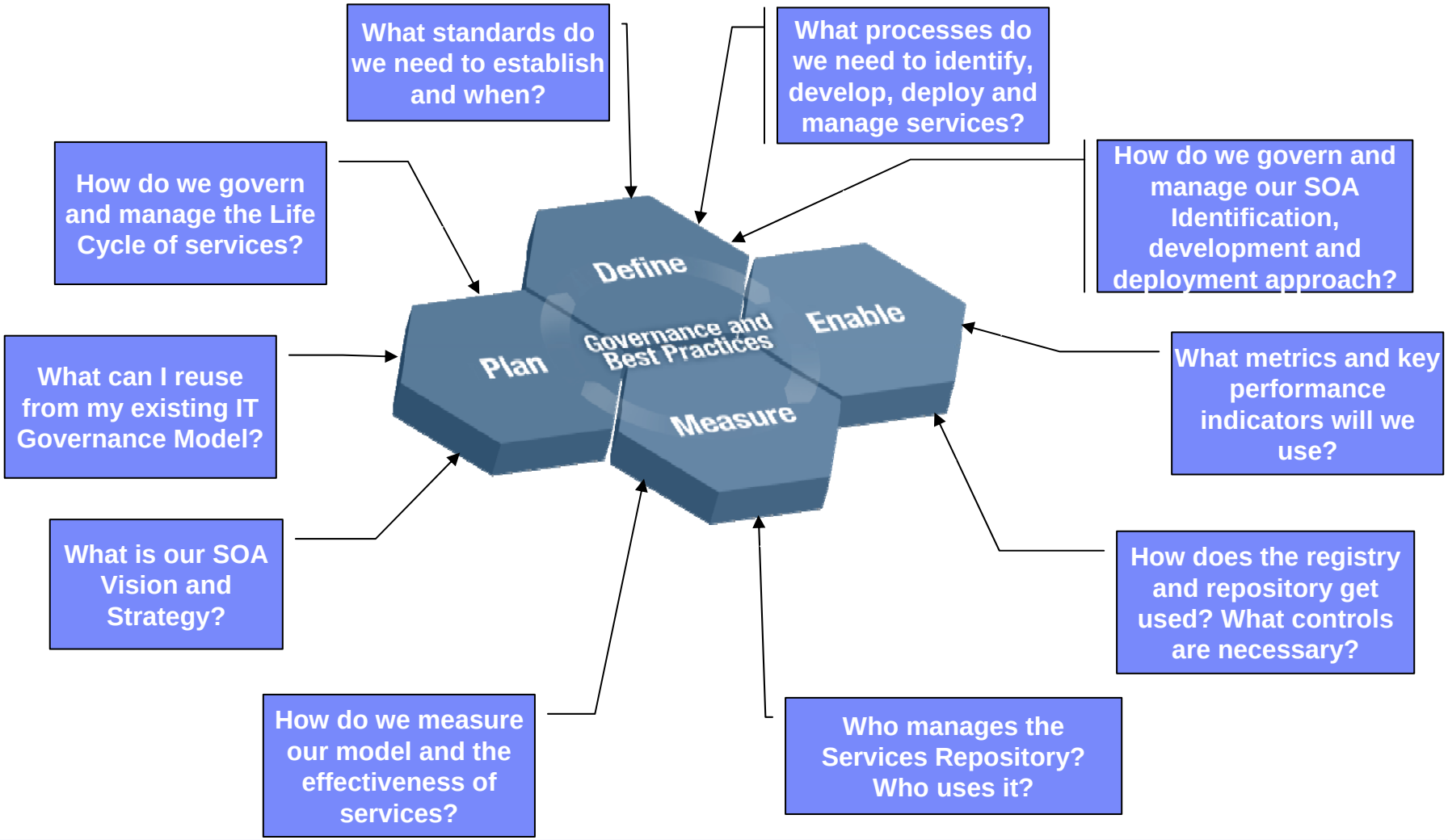
SOA Governance Life Cycle Addresses Key Questions



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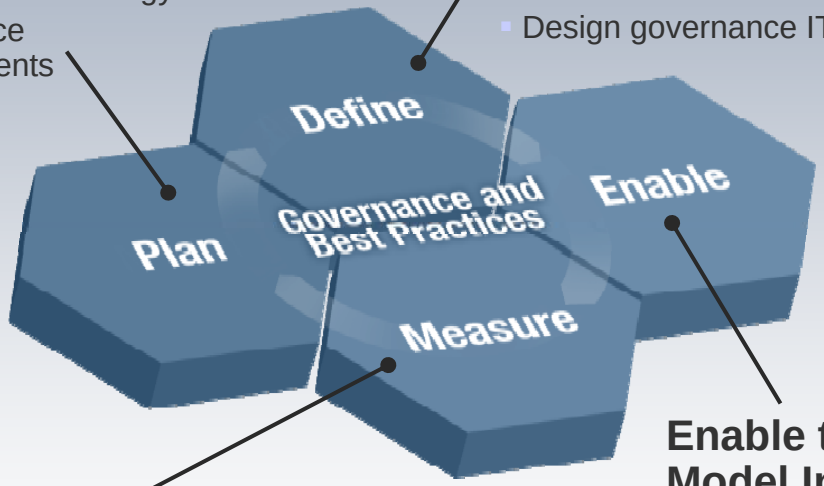
SOA Governance Lifecycle – How to establish?

Plan the Governance Need

- Document and validate business strategy for SOA and IT
- Assess current IT and SOA capabilities
- Define/Refine SOA vision and strategy
- Review current Governance capabilities and arrangements
- Layout governance plan

Define the Governance Approach

- Define/modify governance processes
- Design policies and enforcement mechanisms
- Identify success factors, metrics
- Identify owners and funding model
- Charter/refine SOA Center of Excellence
- Design governance IT infrastructure



Monitor and Manage the Governance Processes

- Monitor compliance with policies
- Monitor compliance with governance arrangements
- Monitor IT effectiveness metrics

Enable the Governance Model Incrementally

- Deploy governance mechanisms
- Deploy governance IT infrastructure
- Educate and deploy on expected behaviors and practices
- Deploy policies

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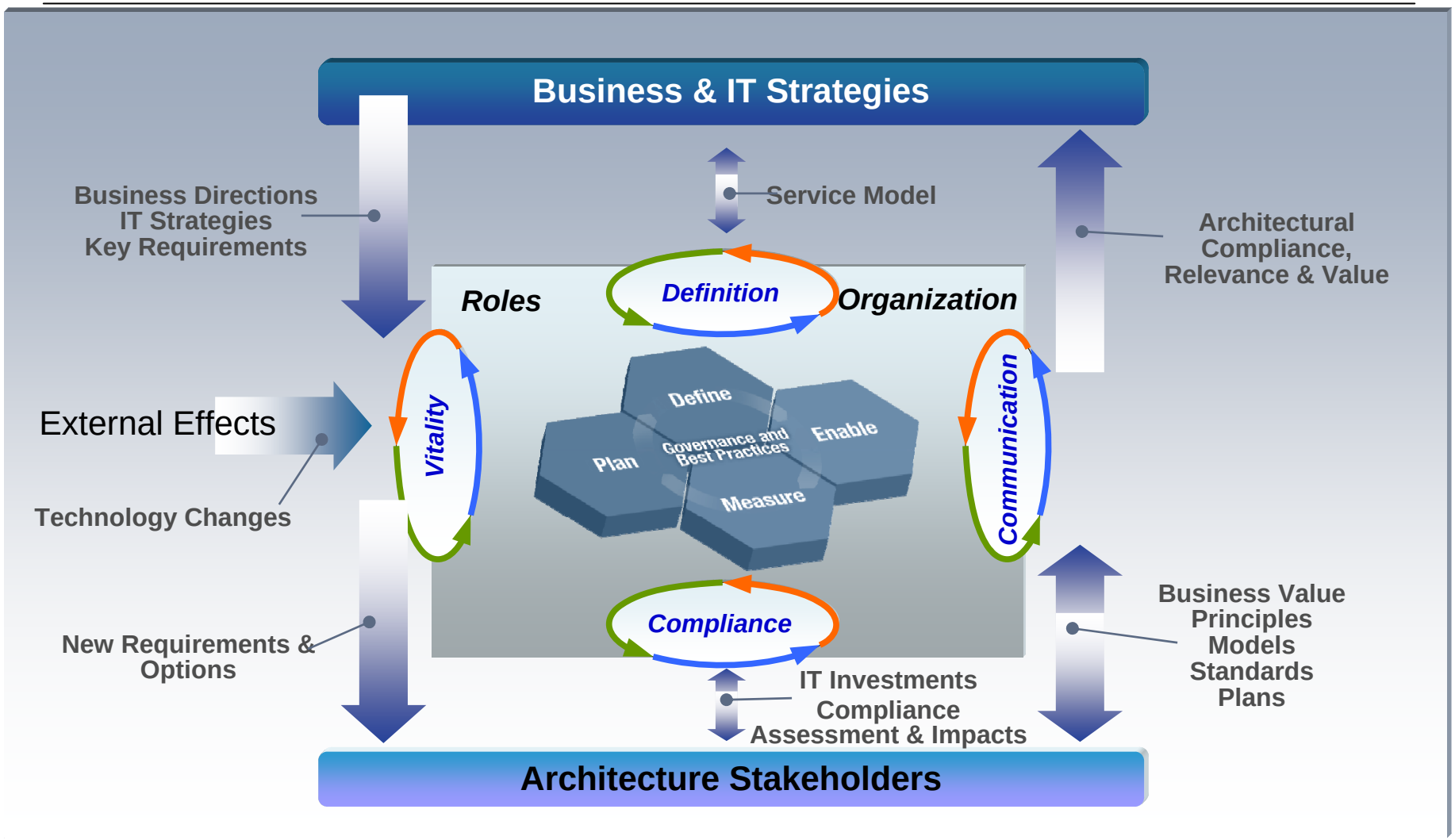
SOA Governance Considerations – What is required ? Processes, Roles and Organization



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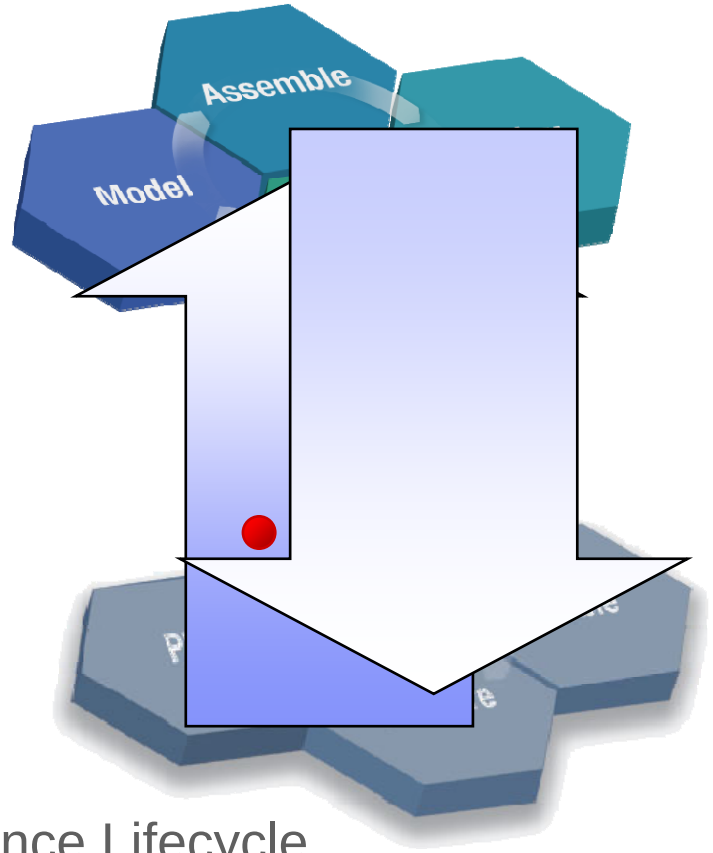
Interaction Between the Lifecycles

Service Lifecycle



Governance Lifecycle

- **Policies**
  - quality gates
  - controls
  - metrics
  - standards
- are **defined** in the Governance lifecycle (for different aspects of Governance)…
- …and they are **enforced** in the service lifecycle
- metrics are captured to improve governance process

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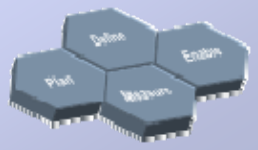
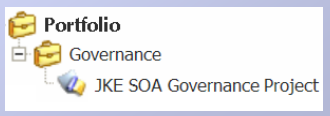
Defining the Governance Solution (Example)

Tailor Methodology

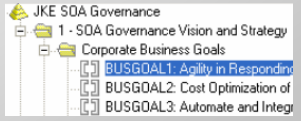


Create Project Proposal



Execute the "JKE SOA Governance Project"

Identify SOA Business and IT Principles



Determine Existing Governance Structure

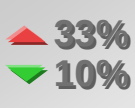
Define CoE Structure

Create the SOA Governance Framework

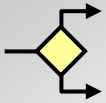
Roles

Processes

Policies



Metrics



Quality Gates

Implement Tools and Infrastructure

WebSphere Lotus Rational Tivoli

Refine Operational Environment

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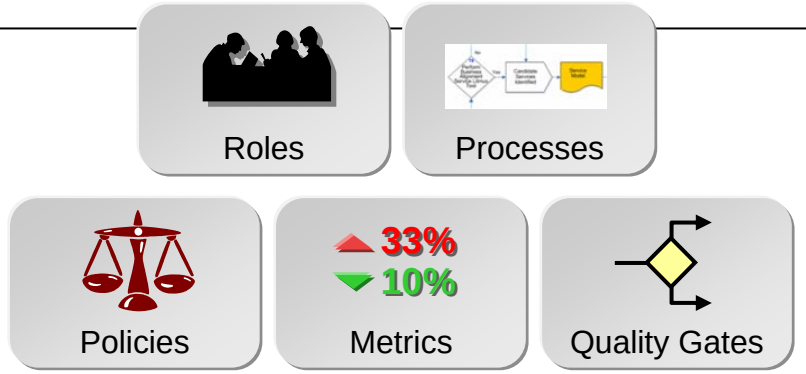
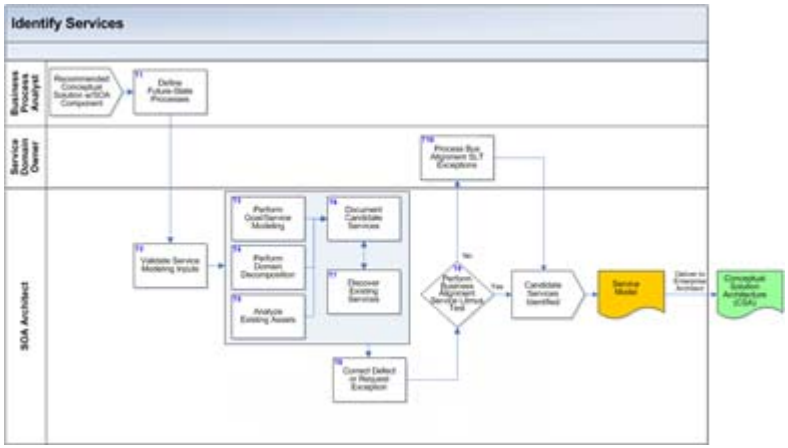
The Governance Framework

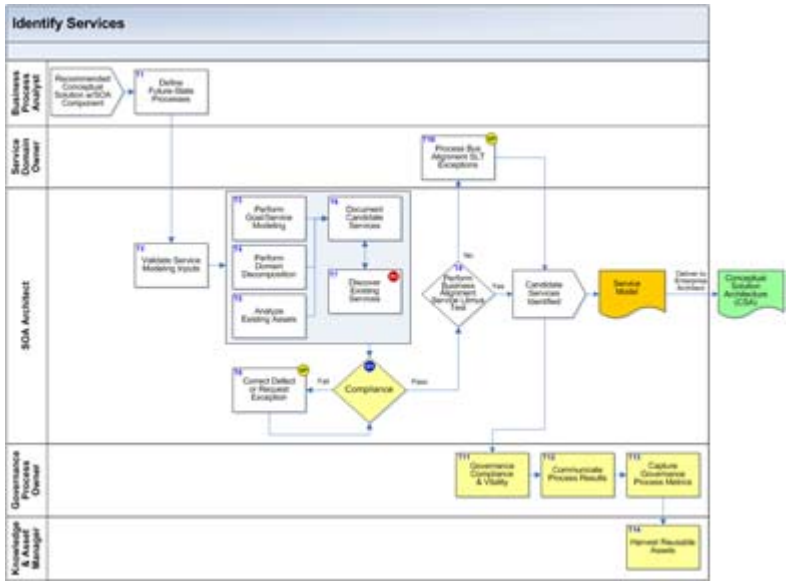
- All the “elements” that we need to add to make a process well-governed



non-governed process



well-governed process



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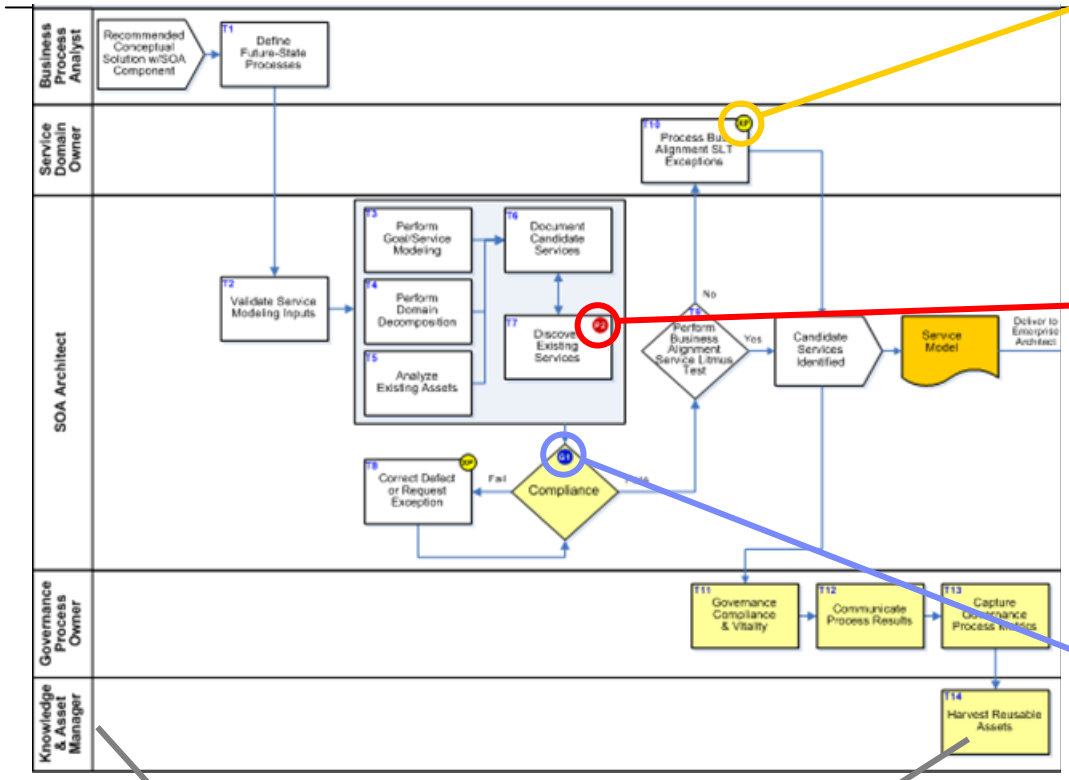
JKE Example: Enforcement at Development Time



exception procedure

Implement Service that failed Litmus test

human decision

policy

Services should be reused instead of created whenever possible

registry lookup

quality gate

Services must be compliant with the existing reference architecture

review

new roles

new activities

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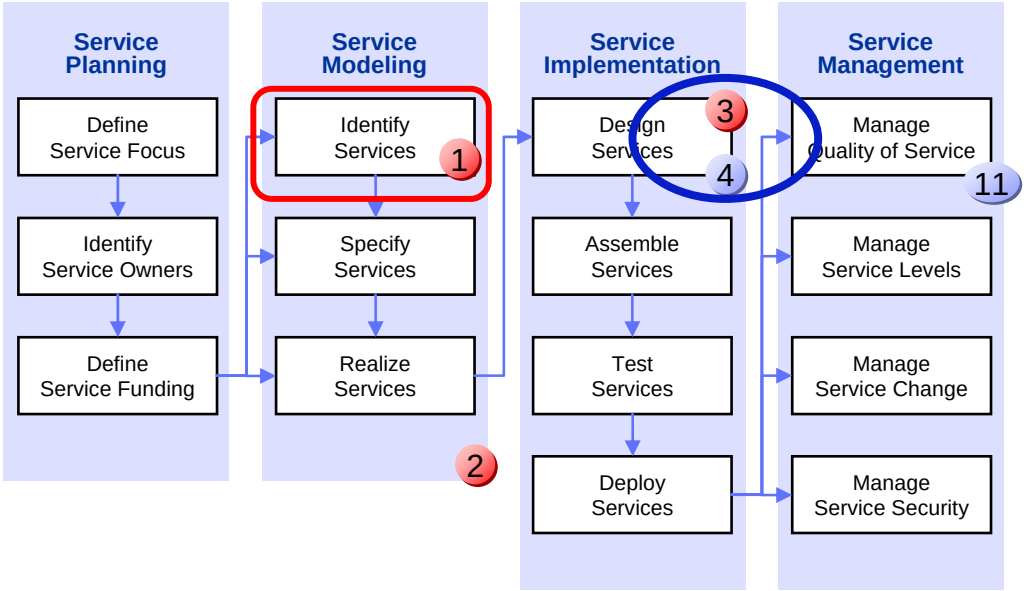
Example – Enforcing Service Reuse Policy

- During the “Identify Services” activities, the SOA Architect implements the Service Reuse policy searching for existing services
- At the Validate Service Design quality gate the policy is enforced



Policy 1 Services should be reused instead of created whenever possible

Quality Gate 4 Validate Service Design, semi-automatic enforcement during development

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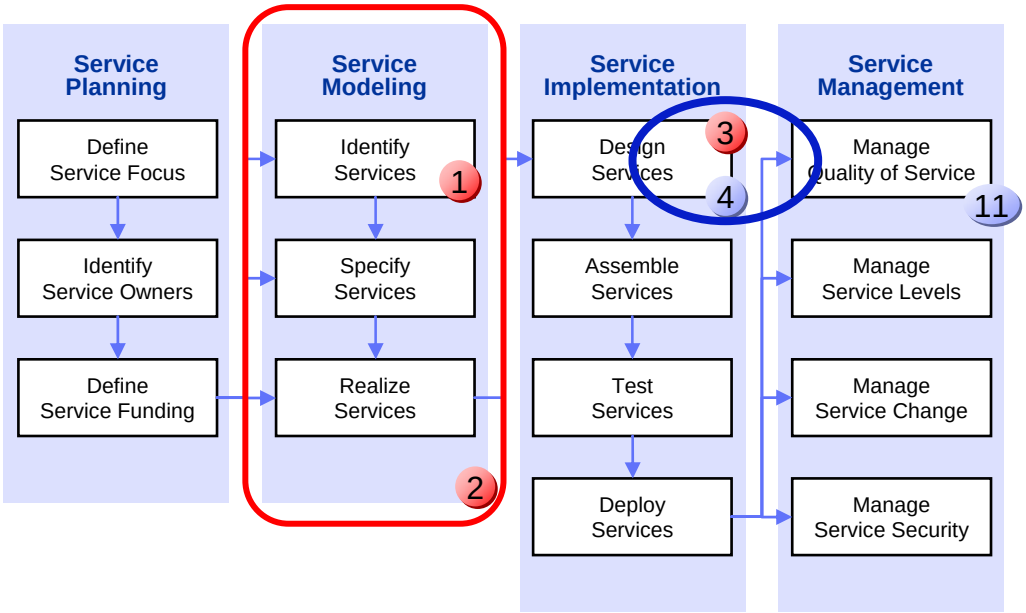
Example – Enforcing Architecture Compliance Policy

- The SOA Architect implements the Compliance with the Reference Architecture policy during all the activities in the Service Modeling phase
- At the Validate Service Design quality gate the policy is enforced with a manual review of the service model



Policy 2 Services must be compliant with the existing reference architecture

Quality Gate 4 Validate Service Design, manual enforcement during development

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Governance at Development Time – Enforcing Policies of Services Life Cycle

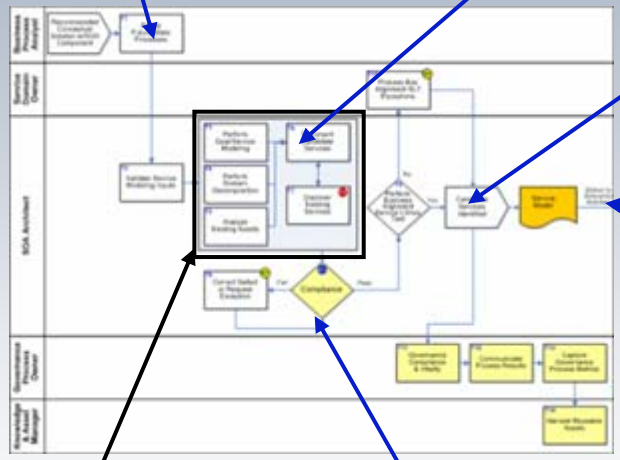
Ensure Compliance and Define Policies

1 Service state transitions are defined based on governance solution

WebSphere Service Registry and Repository

2 Validate Service Ownership

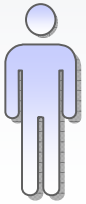
3 Registry Lookup to enforce reuse of existing services



5 Publish Service to repository after Litmus test is successful

6 Add a Policy for Dynamic Binding

Service Analysis and Design



4 Validate Service Design for Standards Compliance

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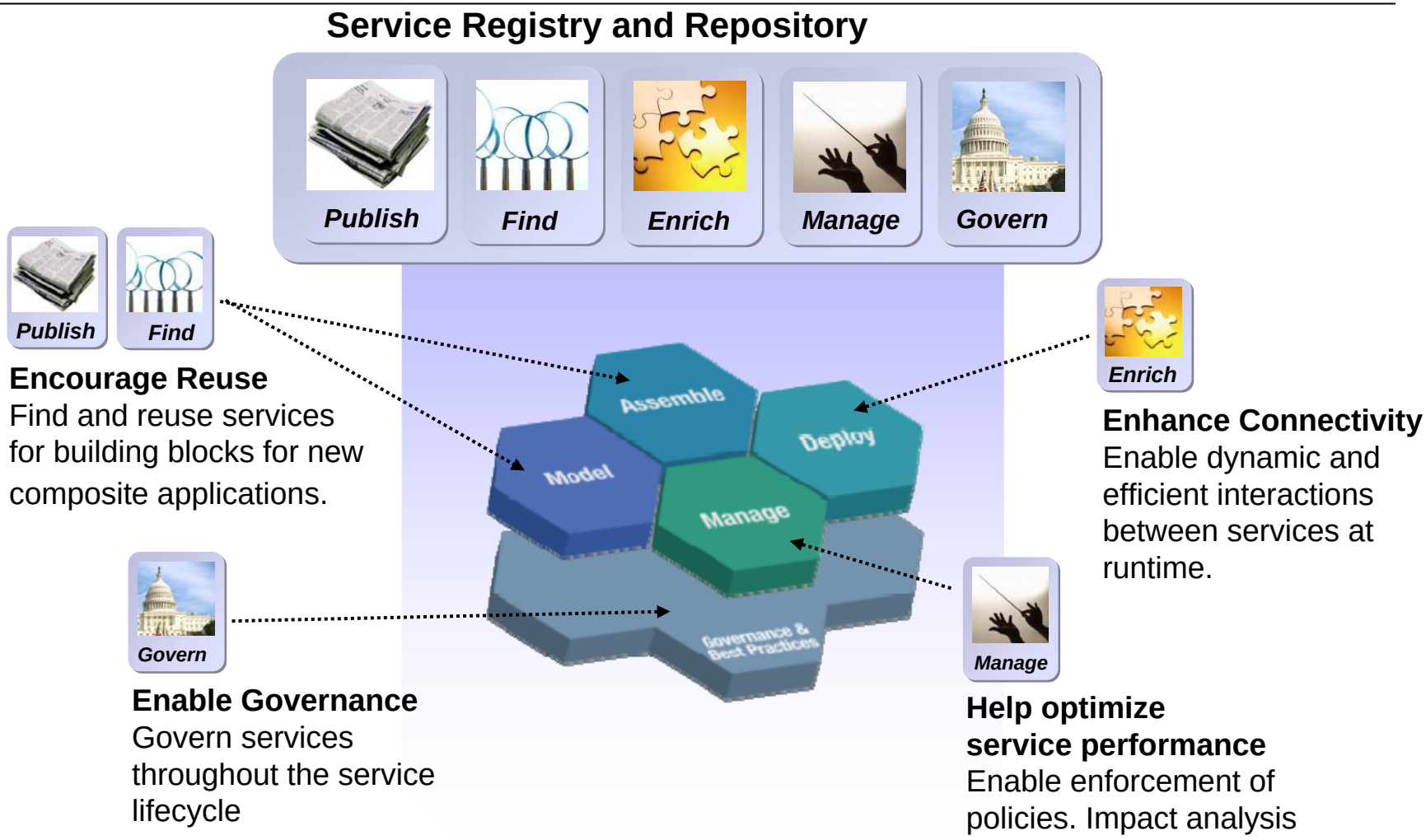
Main Capabilities of Service Registry and Repository



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IV. More about Case FACT

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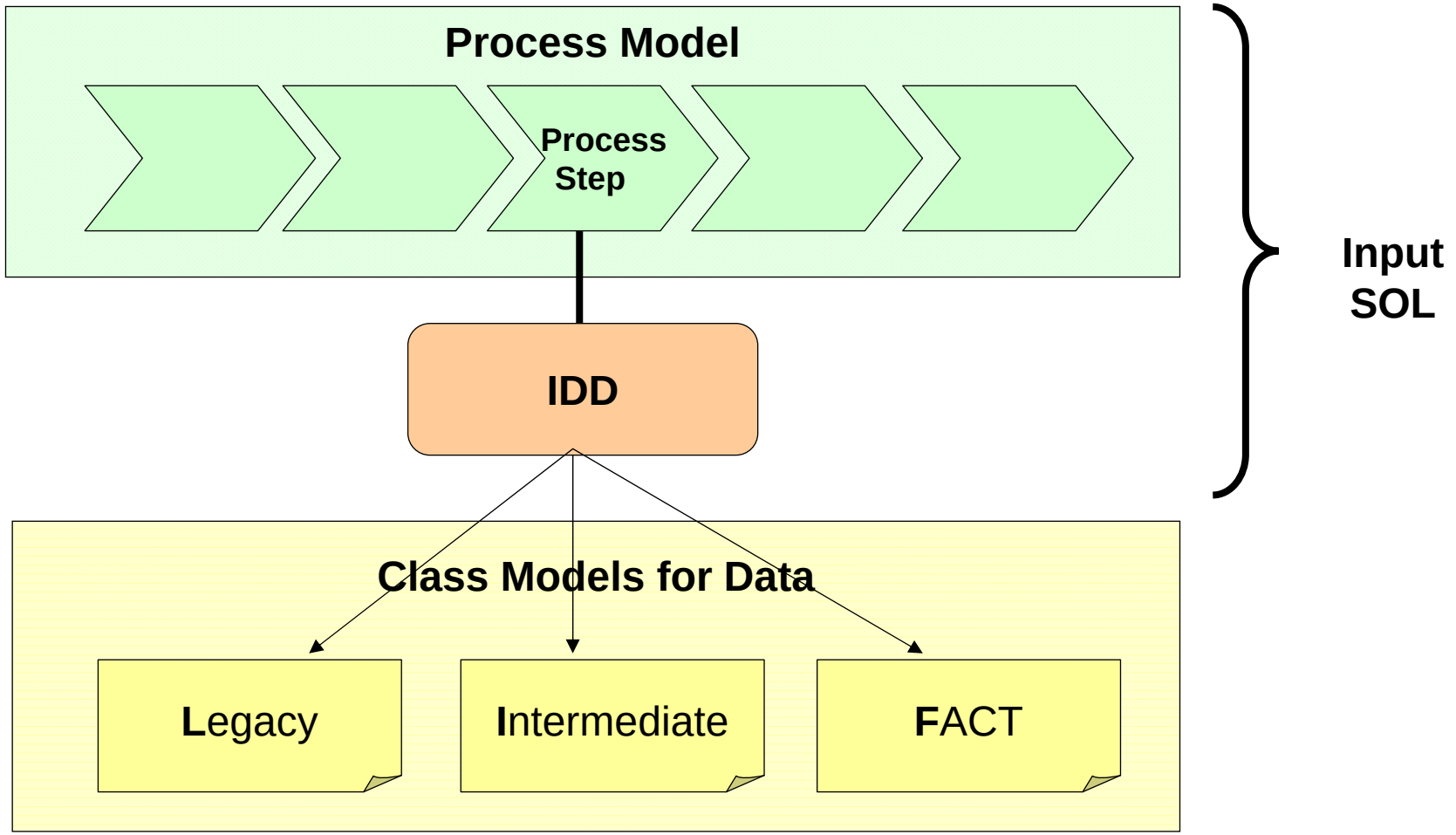
Process Model / IDD / Class Models for Data Structures



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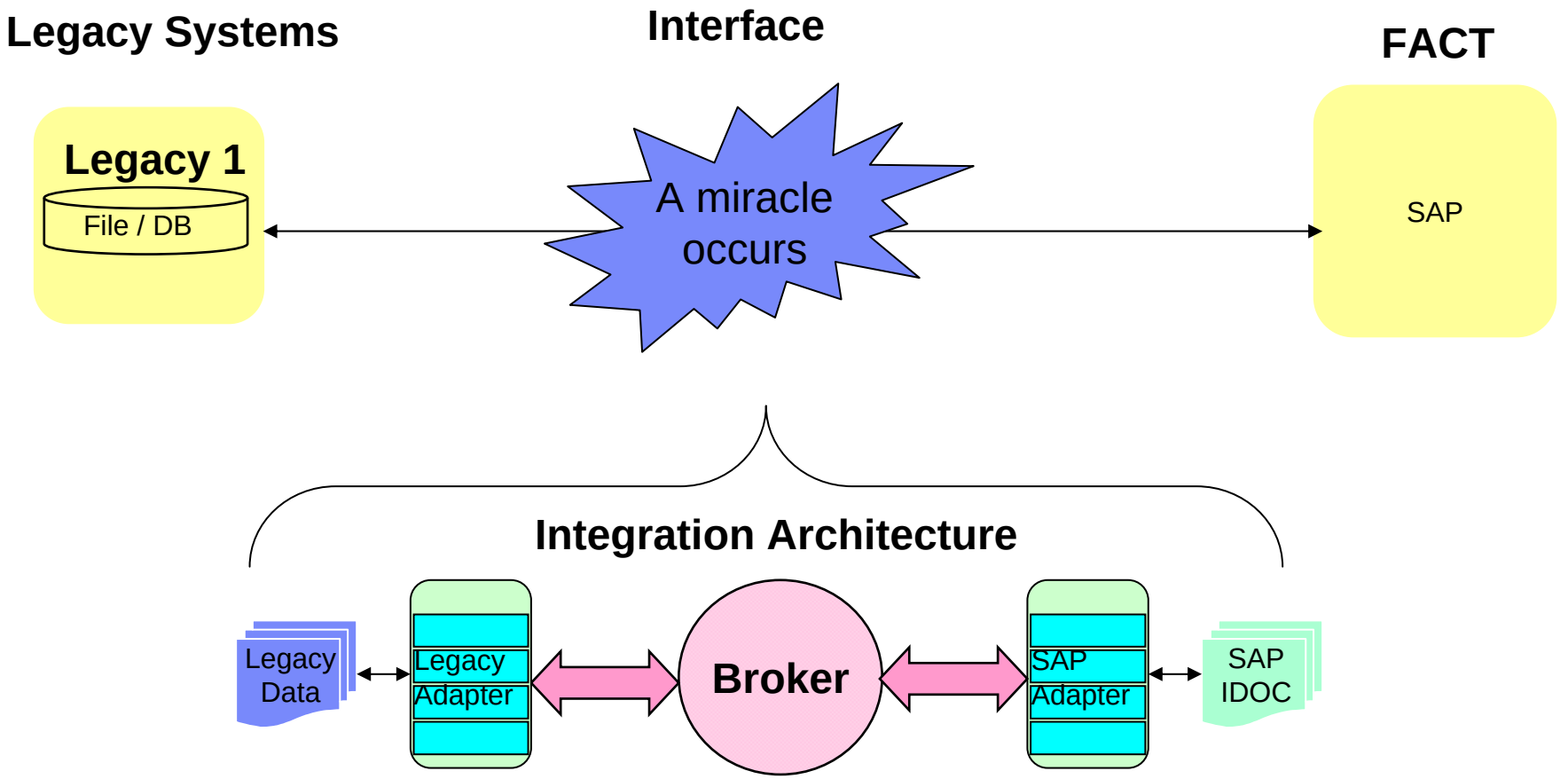
Integration Architecture is about breaking “Interfaces” into smaller chunks



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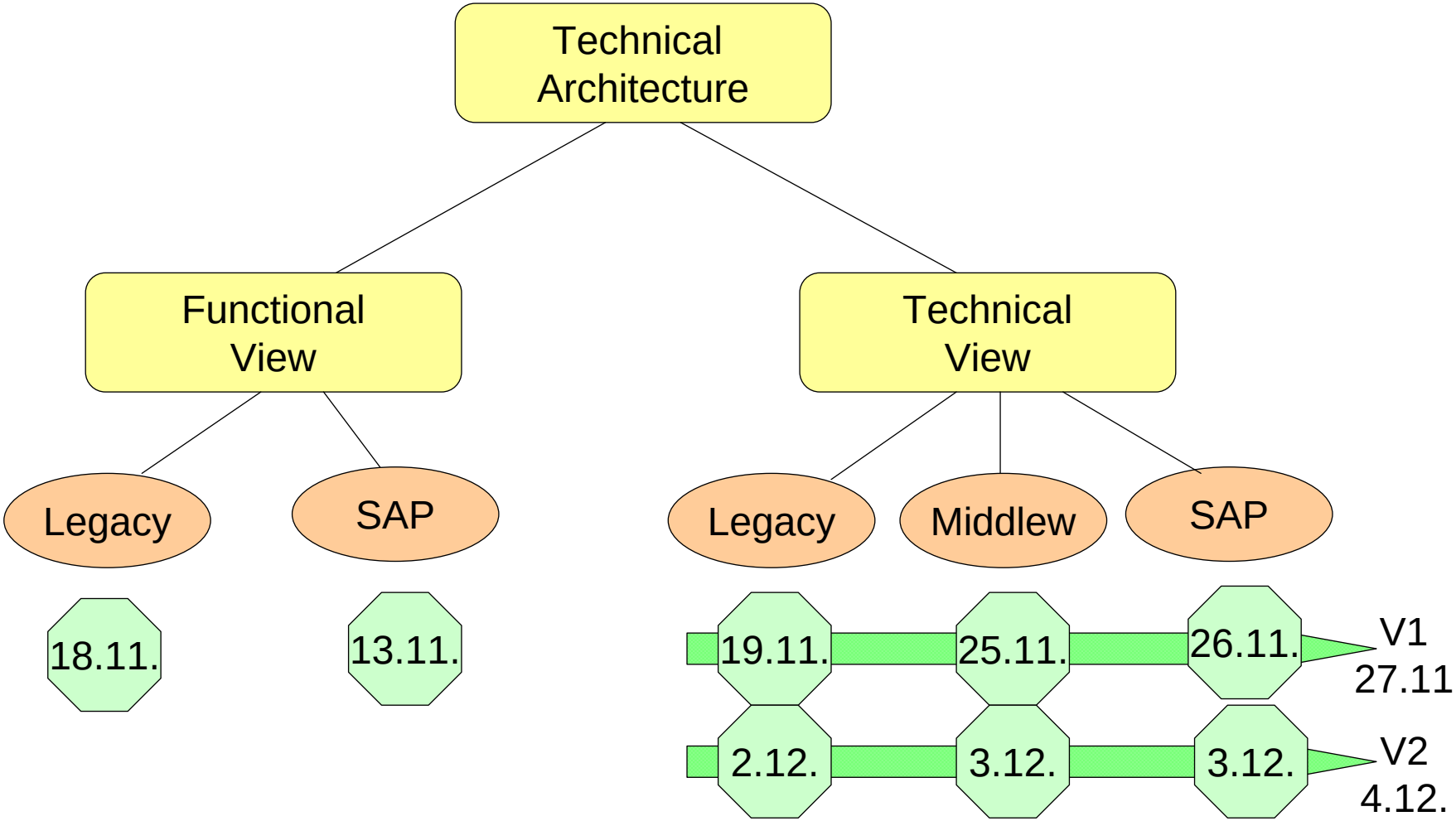
Technical Architecture – Planning End of 2003



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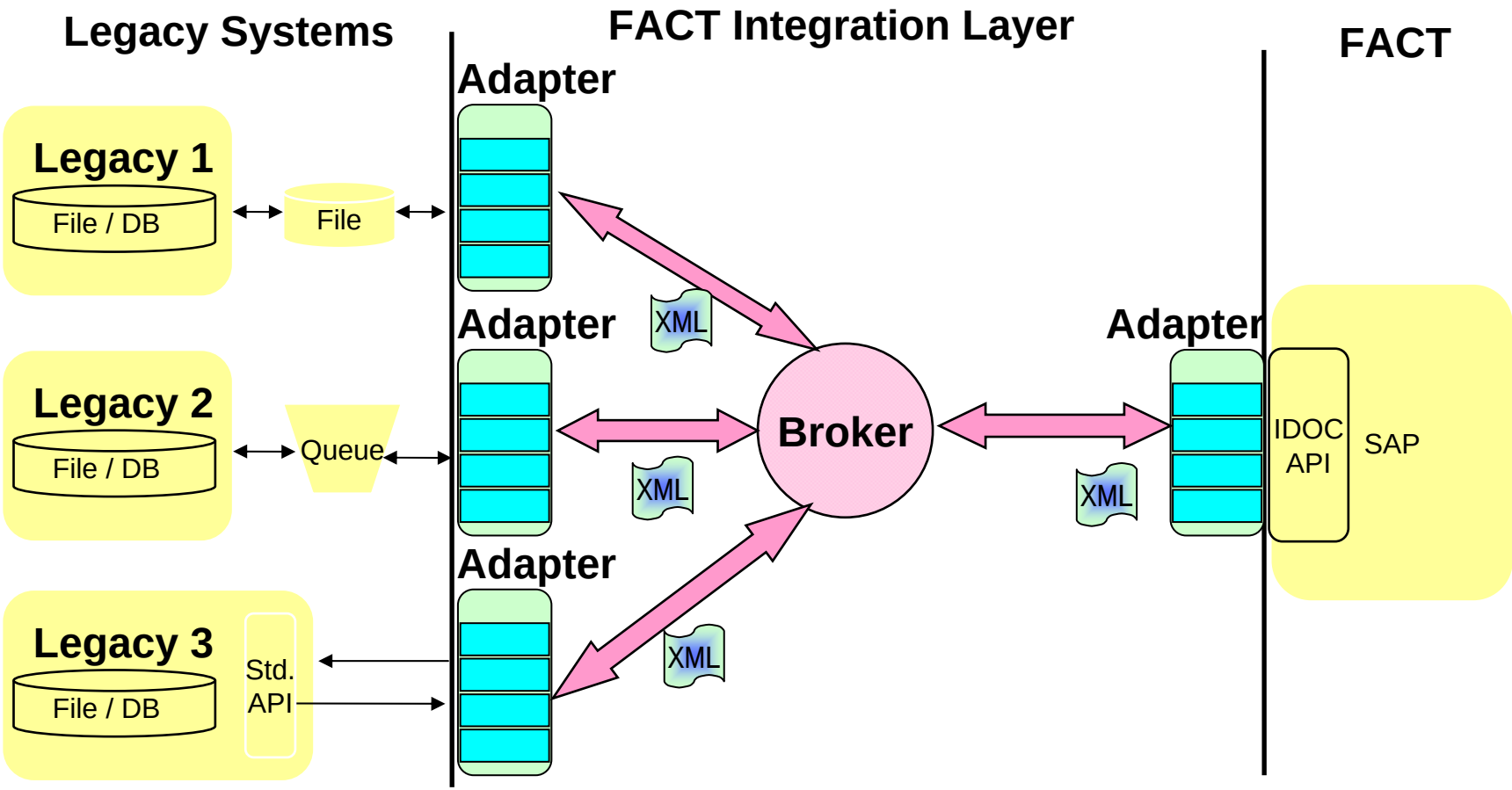
FACT Integration Layer – Technical View



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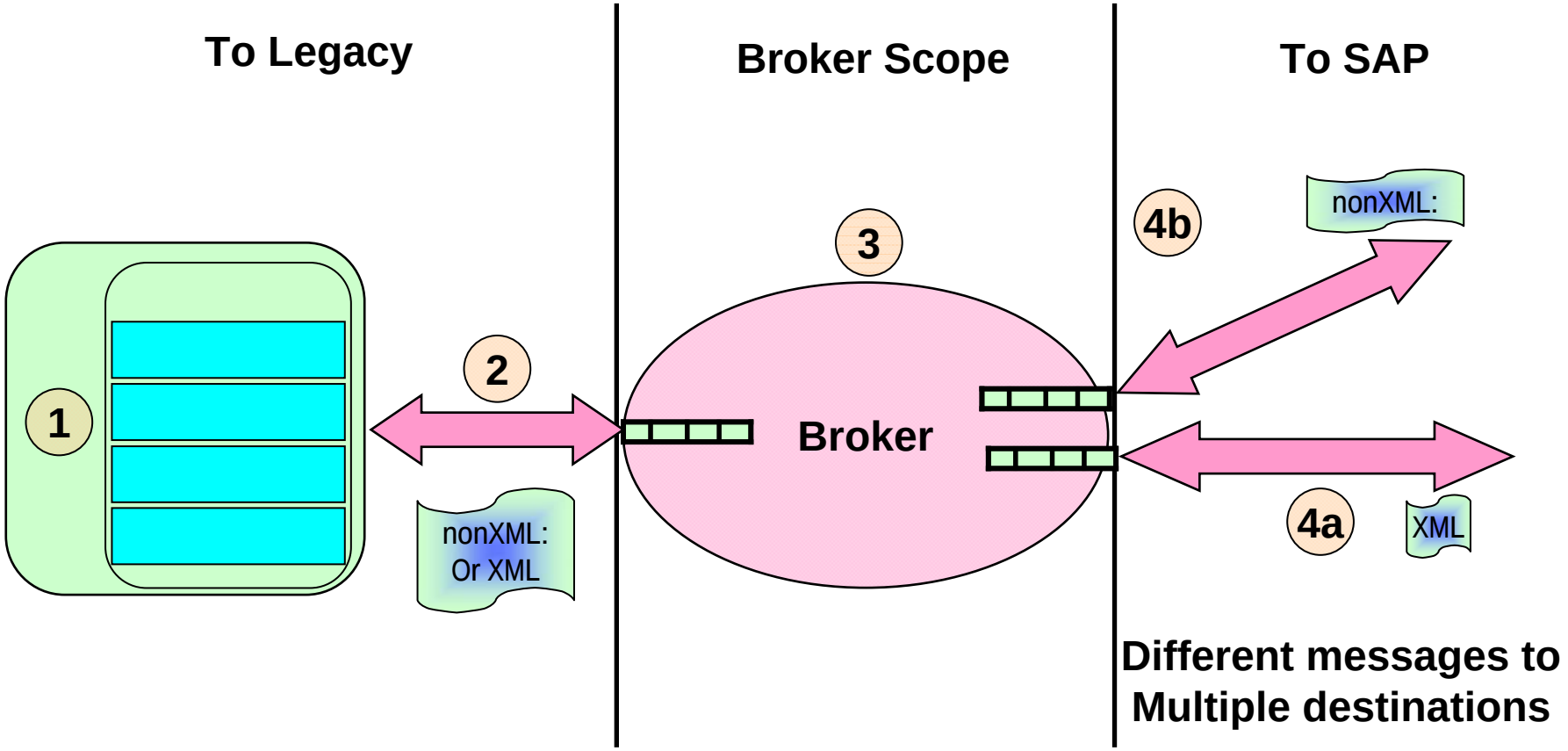
Example use of Pattern: one-to-many with different messages (Feed and R/R – Request/Reply)



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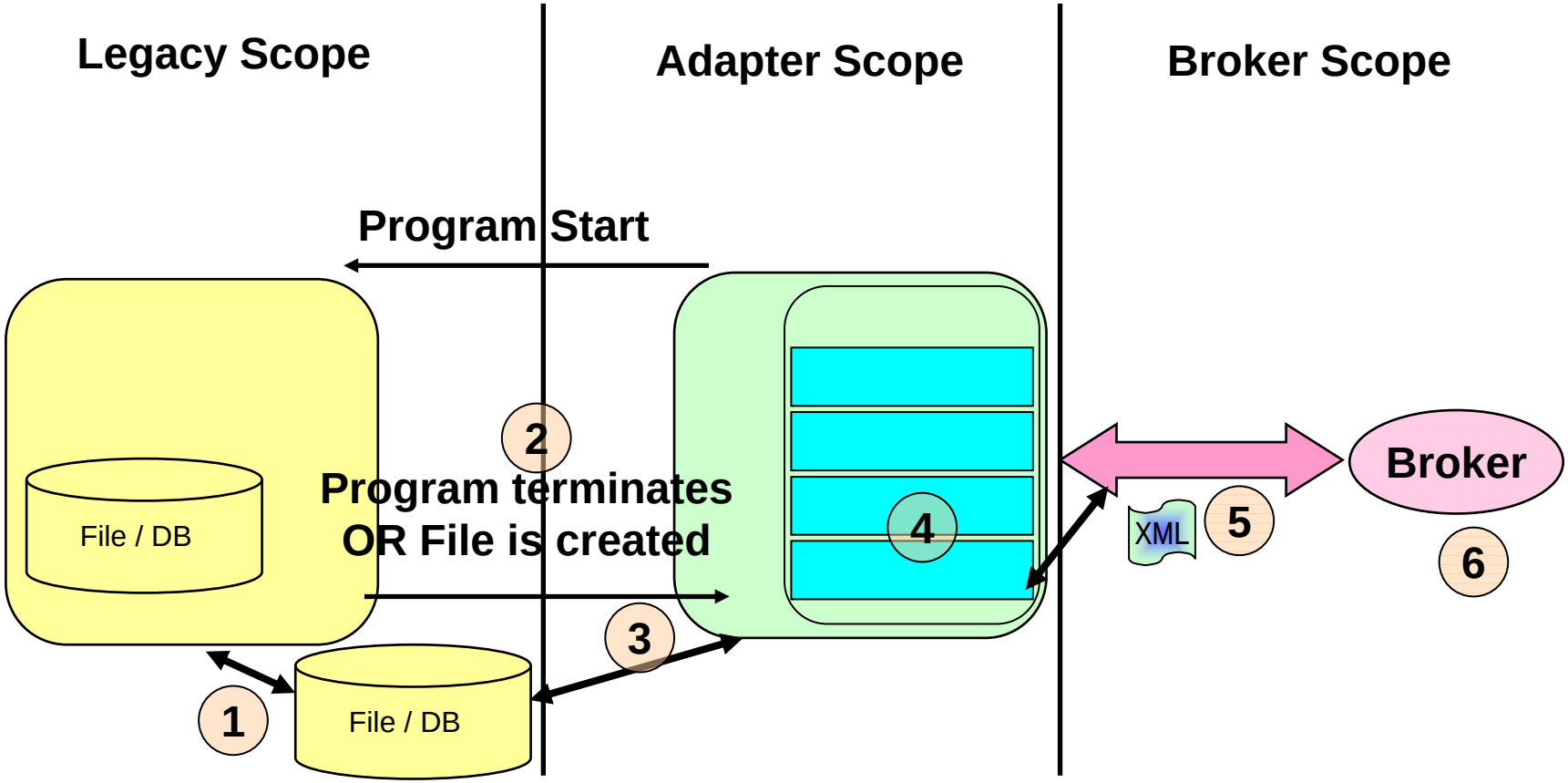
Patterns for Information Flow “Feed” – 1: Legacy



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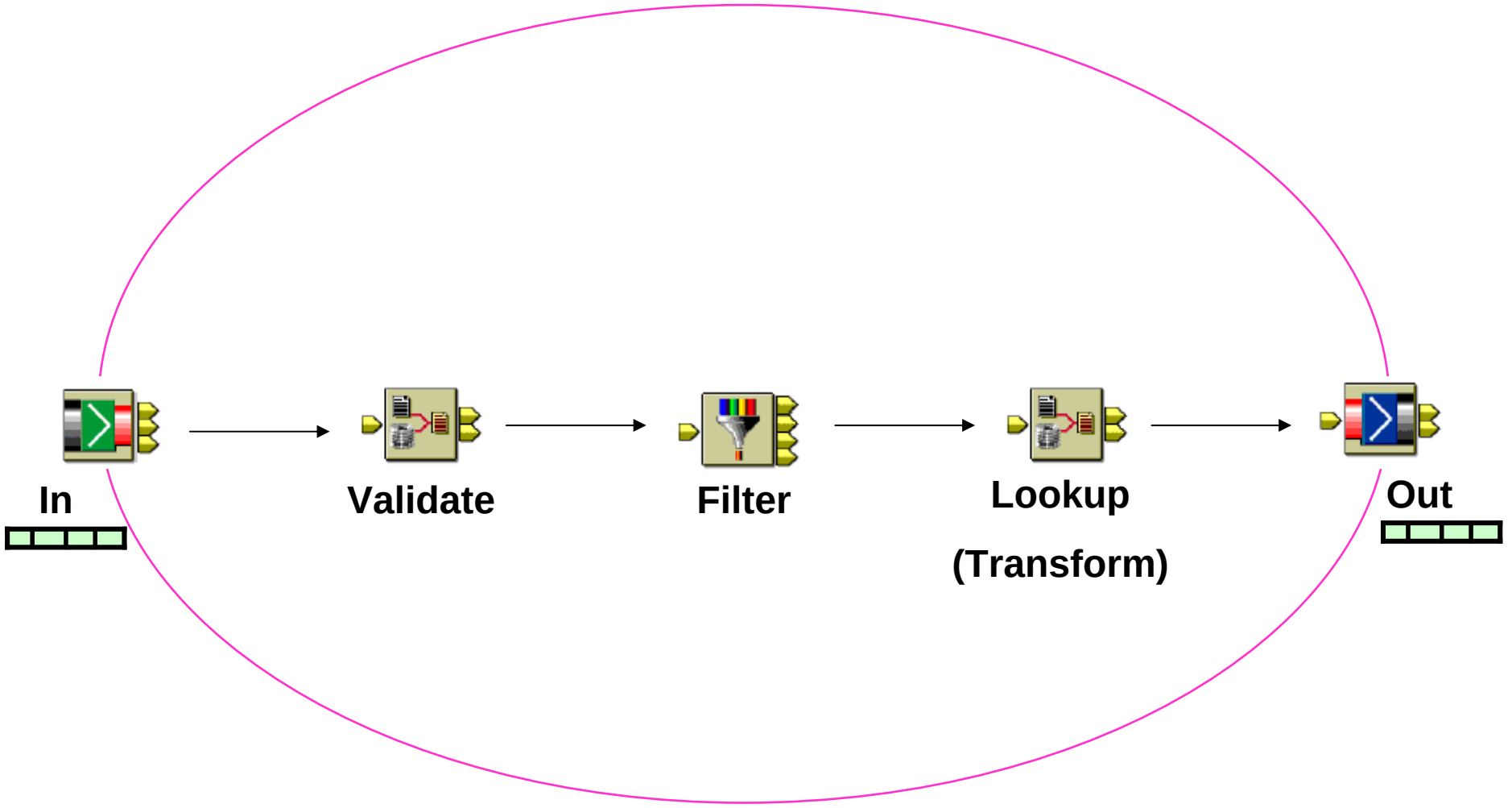
Patterns for Information Flow “Feed” – 2: Broker Flow



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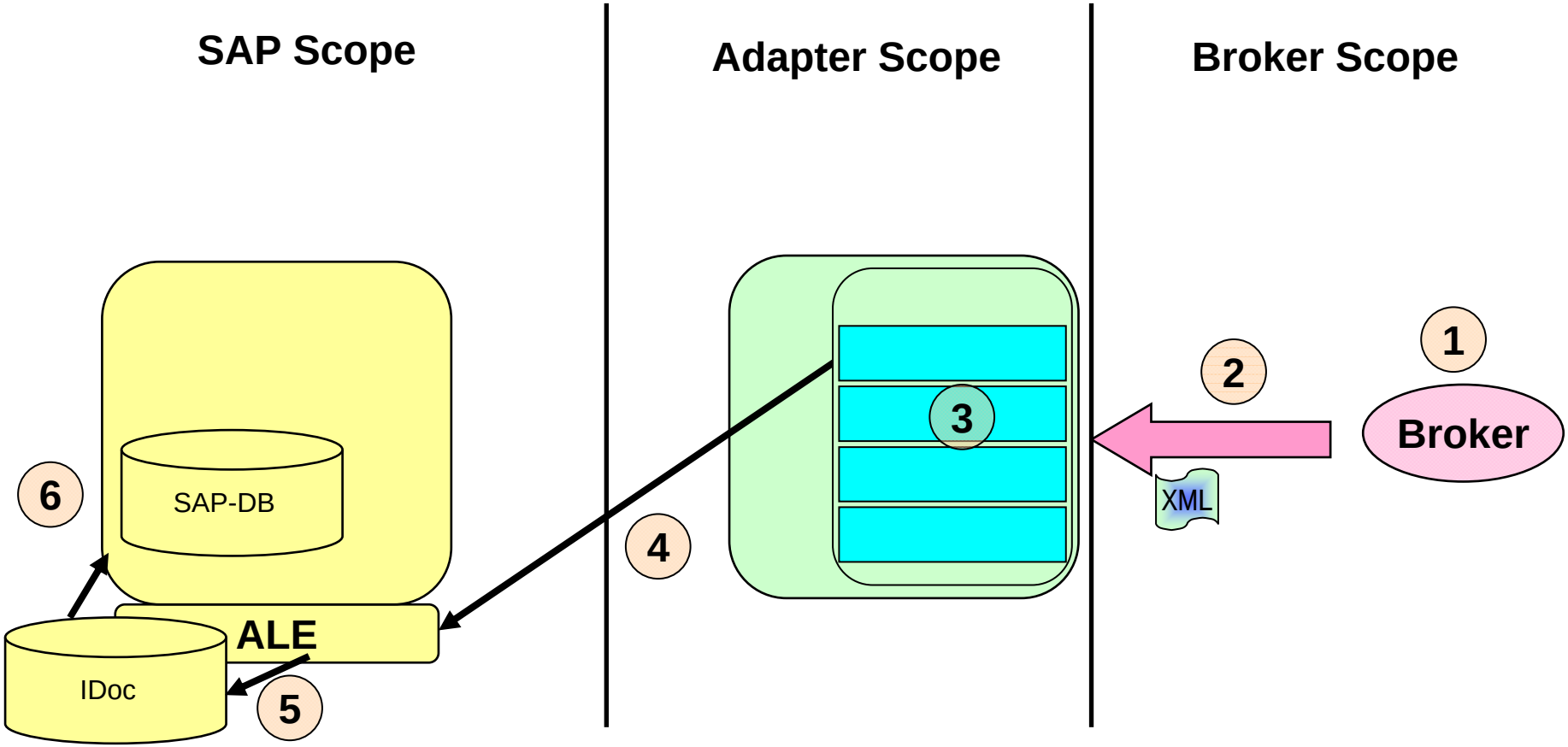
Patterns for Information Flow “Feed” – 3: SAP



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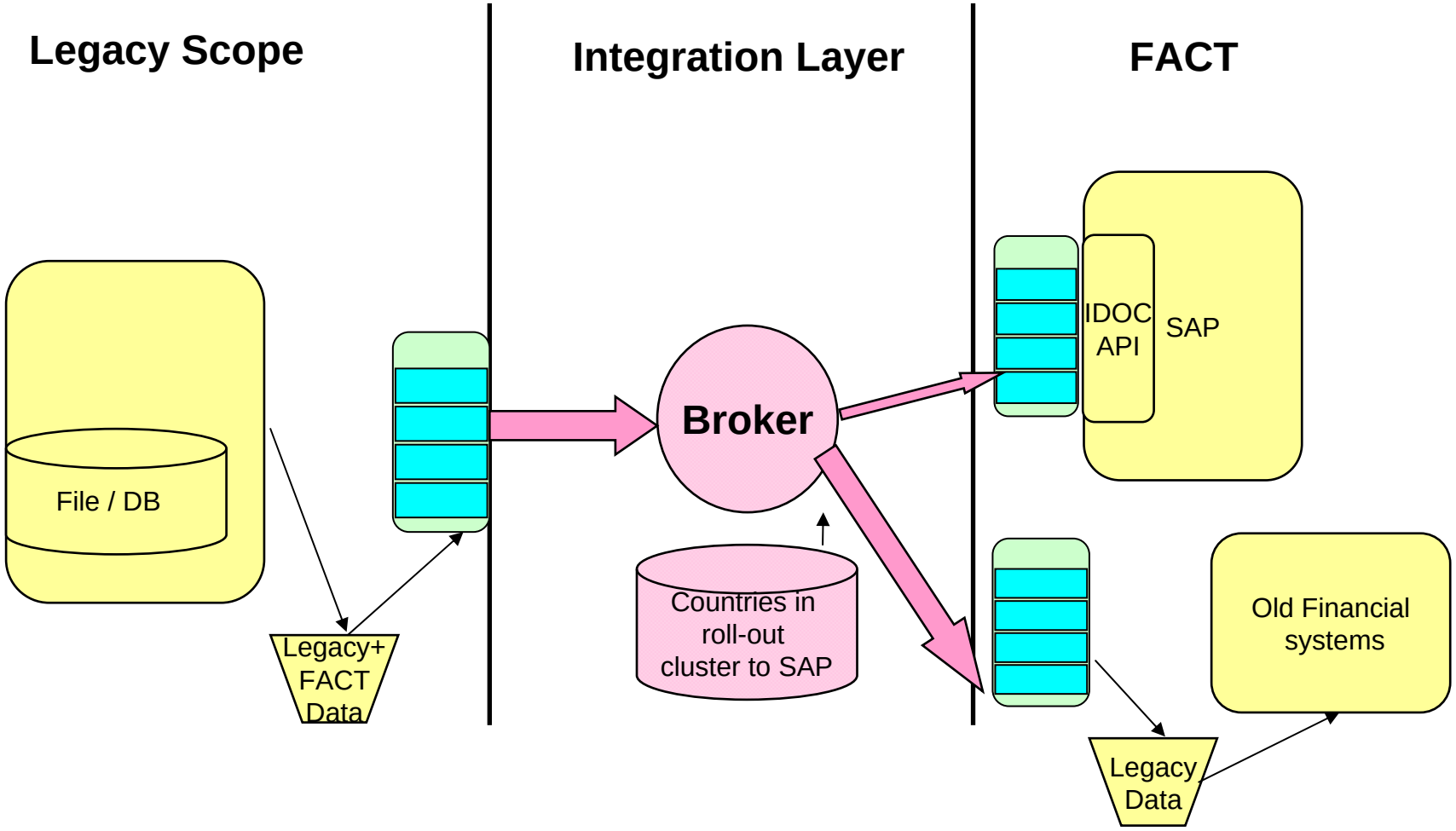
Technical Architecture Specifics: Switching supported by Country Dependent Routing



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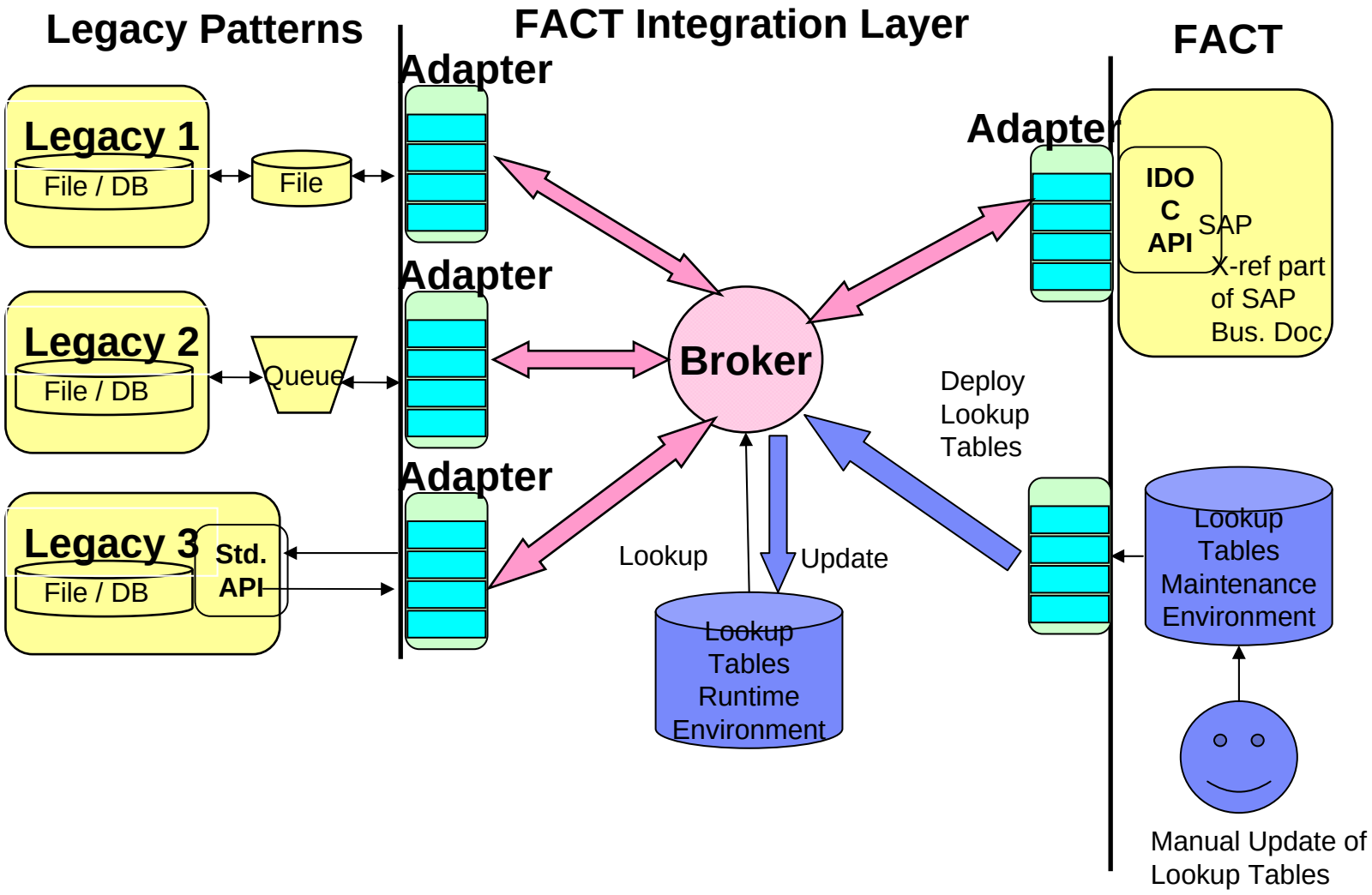
Technical Architecture Specifics: Translation of codes



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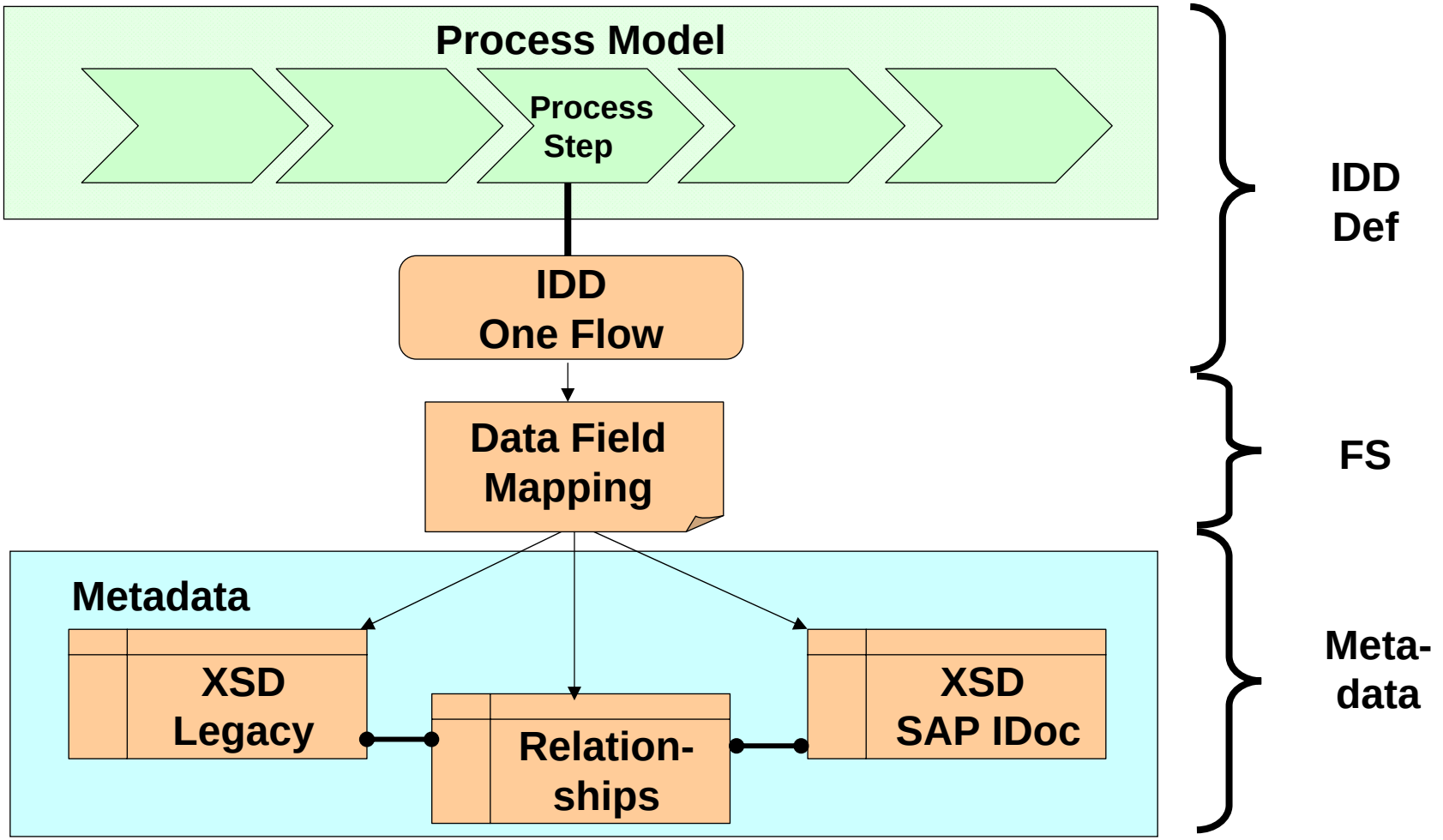
Deliverables of Data Structures for an IDD



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Overview

- IDD (Interface Detailed Definition) related to a step in the Business Process – may include multiple information flows

- FS (Functional Specification)
  - *Functional Specification* (FS) defines data (SAP and Legacy) from Business Perspective, including some transformations
  - Data Structure include IDoc / BAPI as well as Legacy interface data structure to be used and or customized

- TS (Technical Specification)
  - *Technical Specifications* (TS) (Overview, SAP, Legacy, Broker) include AND *data models* and XSD (XML Schema Definition) for XML of SAP IDocs, XML of Legacy Application Interfaces, Transformations

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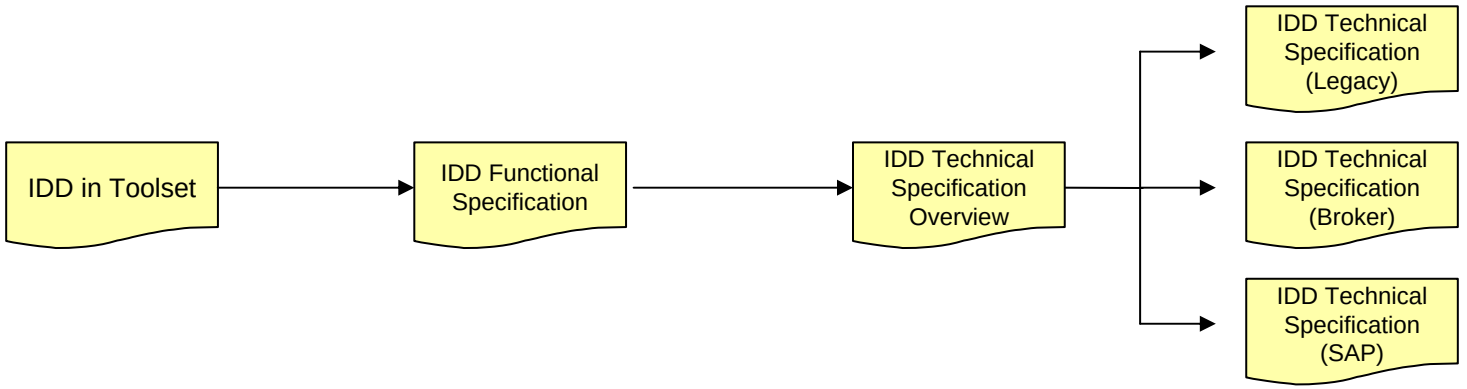
Functional and Technical Specification: IDD and Regular Information Flow



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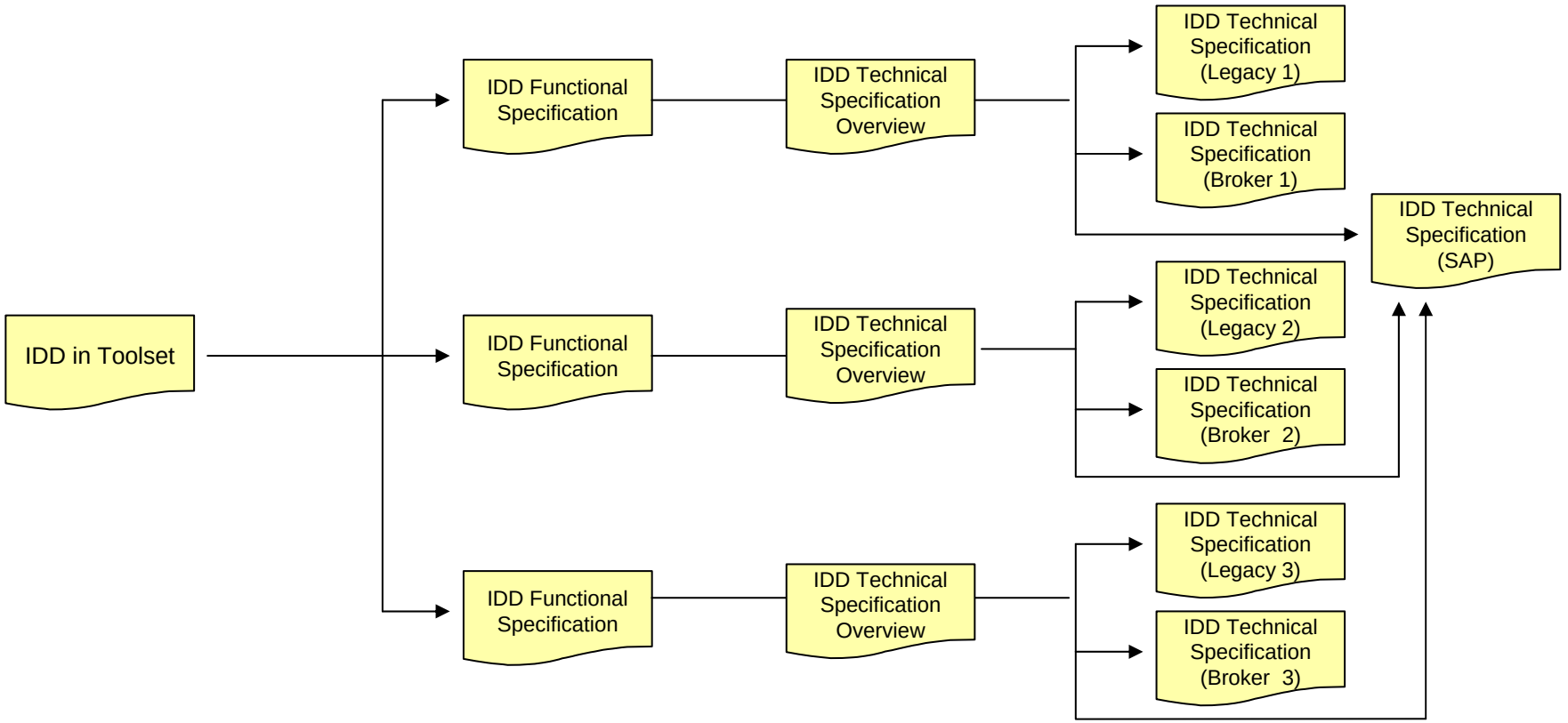
Functional and Technical Specification: IDD and Multiple Information Flows



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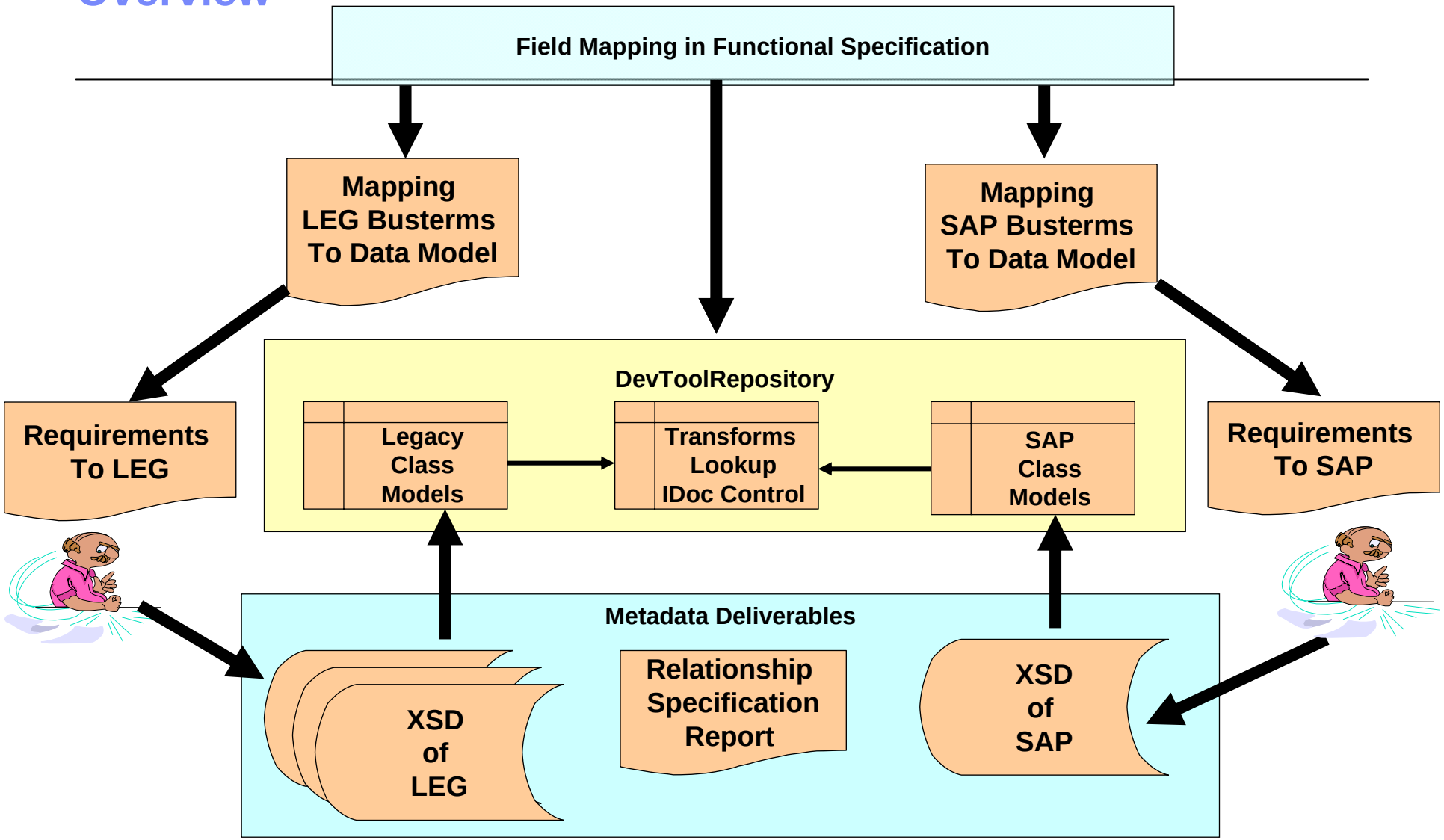
Overview



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Closing Remark

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