# IBM SOA Architect Summit

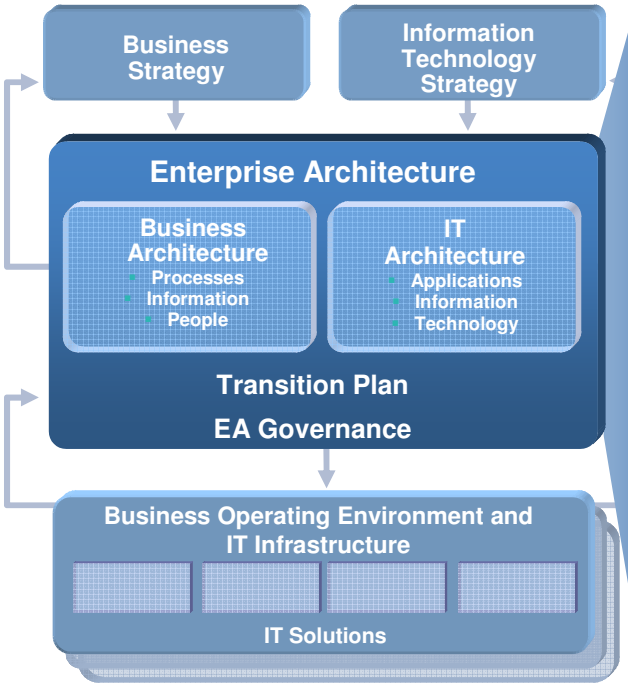
GET PRACTICAL HELP TO MEET THE DEMANDS OF YOUR BUSINESS.

## The A is for Architecture

Ian Turton

16th September 2008

# SOA Architect Summit Roadmap




## What is the impact of SOA on current Enterprise Architectures?

- Alignment of Business and IT Architectures
- SOA Reference Models
- SOA Governance

### How do you develop SOA with a business focus?

- Business Components
- SOA Design
- Business Process Management

### How do you reuse applications in the context of SOA?

- Asset Discovery
- Application Reuse

### How do you leverage information in an SOA?

- Information as a Service
- Master Data Management

### How does my infrastructure support SOA?

- Service Management / QoS
- Security



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# From a market perspective the perception of SOA has evolved from an architectural framework into an adaptive and flexible business principle.

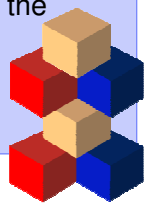
## 2003: IT driven SOA Perception

SOA Definition

**SOA as an Architectural Framework**

A **service-oriented architecture (SOA)** is an architectural framework that takes everyday business applications and breaks them down into **individual business functions called services.**

An SOA lets you build, deploy and integrate these services **independent of applications** and the computing platforms on which they run.



## 2008: Business Driven SOA Perception

**… business strategy analysis**

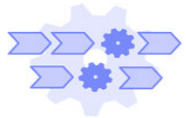
**Component Business Modeling to analyze strategy and to optimize Business Model**

Business Innovation

Focus on "What makes you special"

**… as business process optimizer**

**Business Process Management models, simulates, analyzes and continuously redesigns business processes**



Implement designed processes with SOA

Monitor performance for further improvement

**… as architectural Framework**

**SOA infrastructure orchestrates business processes and mediates service providers**

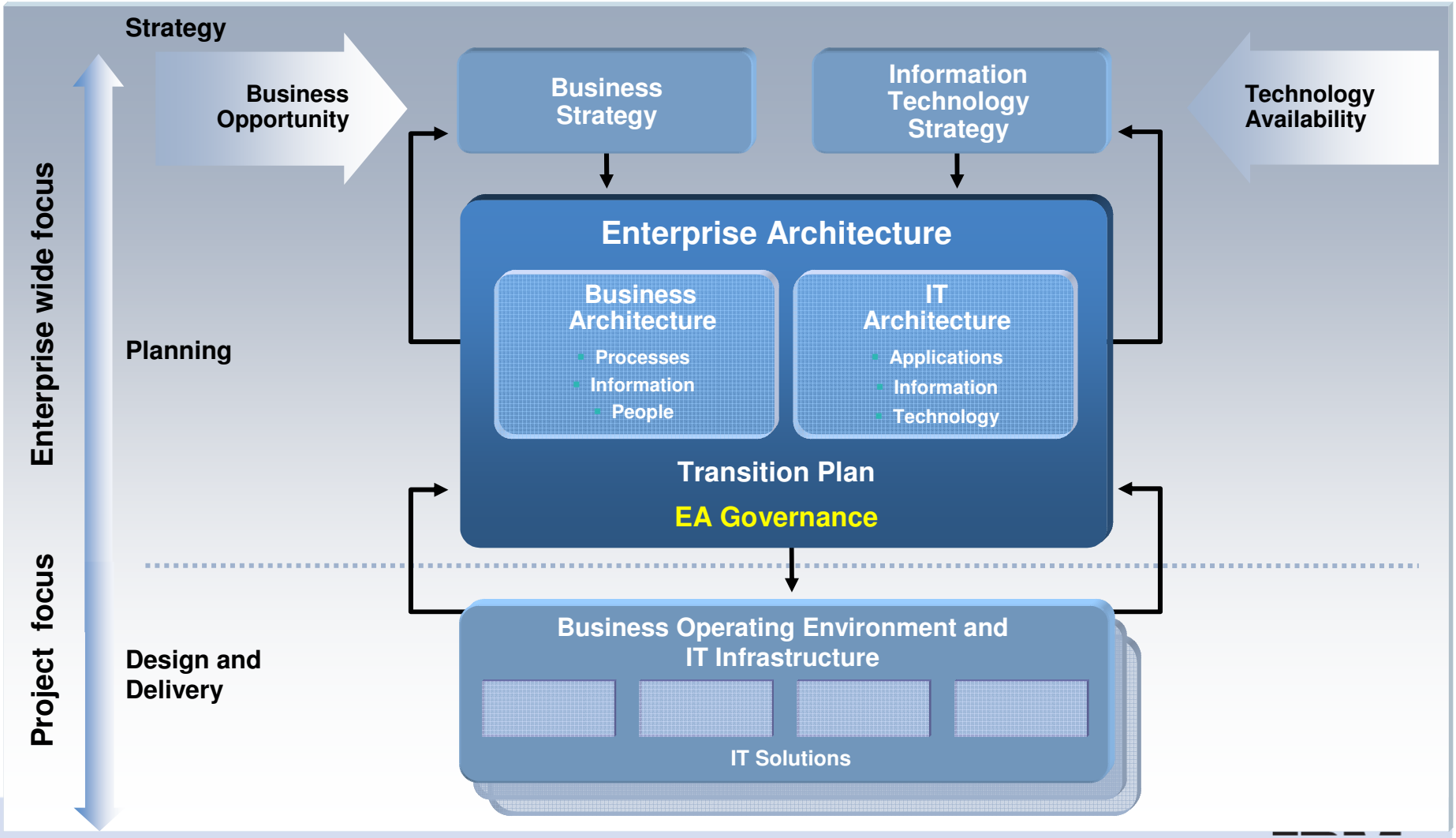
Key Question: Where does an SOA approach generate most business value ?

# Agenda

- SOA and Enterprise Architecture
- SOA Business Architecture Considerations
  - Business Strategy
  - SOA Design
  - Business Process Management
- SOA Business Architecture Best Practices
- IBM Capabilities to Support SOA Business Architecture
- Summary

# SOA and Enterprise Architecture

Don't forget the Finances!



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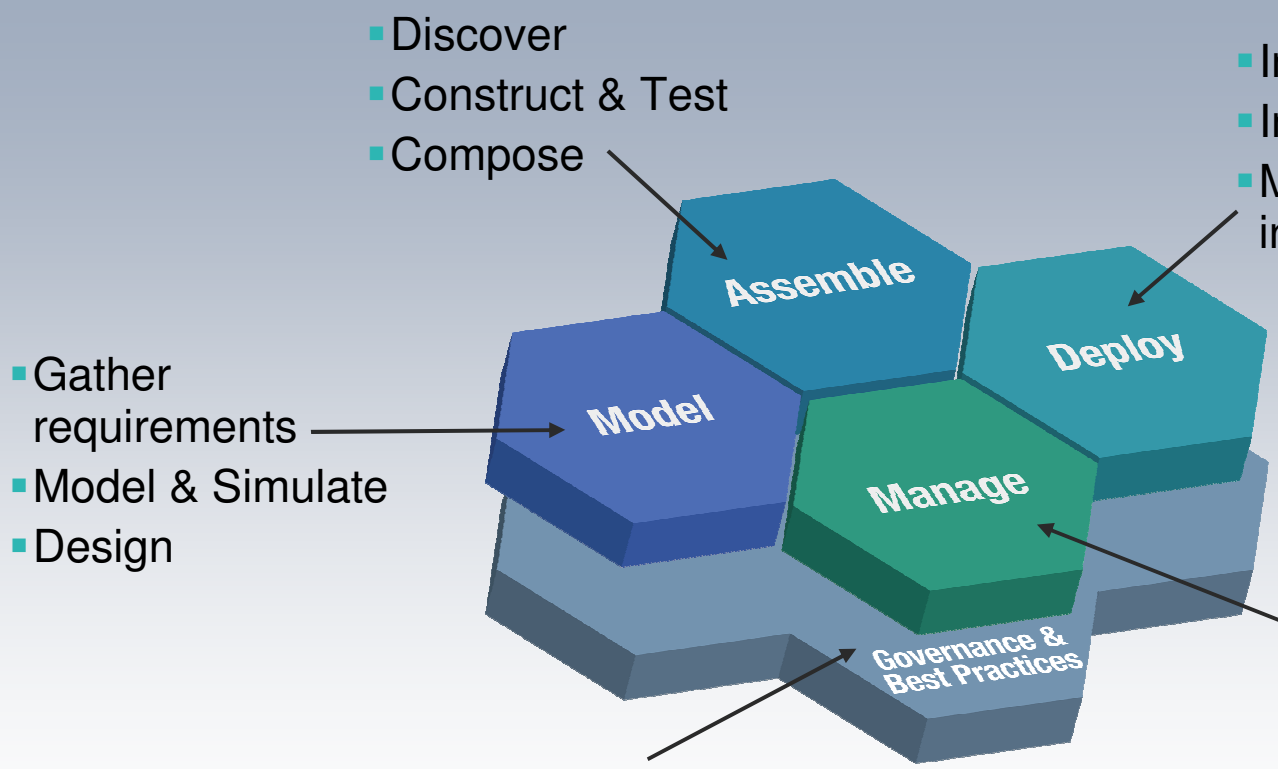
# The SOA Lifecycle




- Discover
- Construct & Test
- Compose

- Integrate people
- Integrate processes
- Manage and integrate information

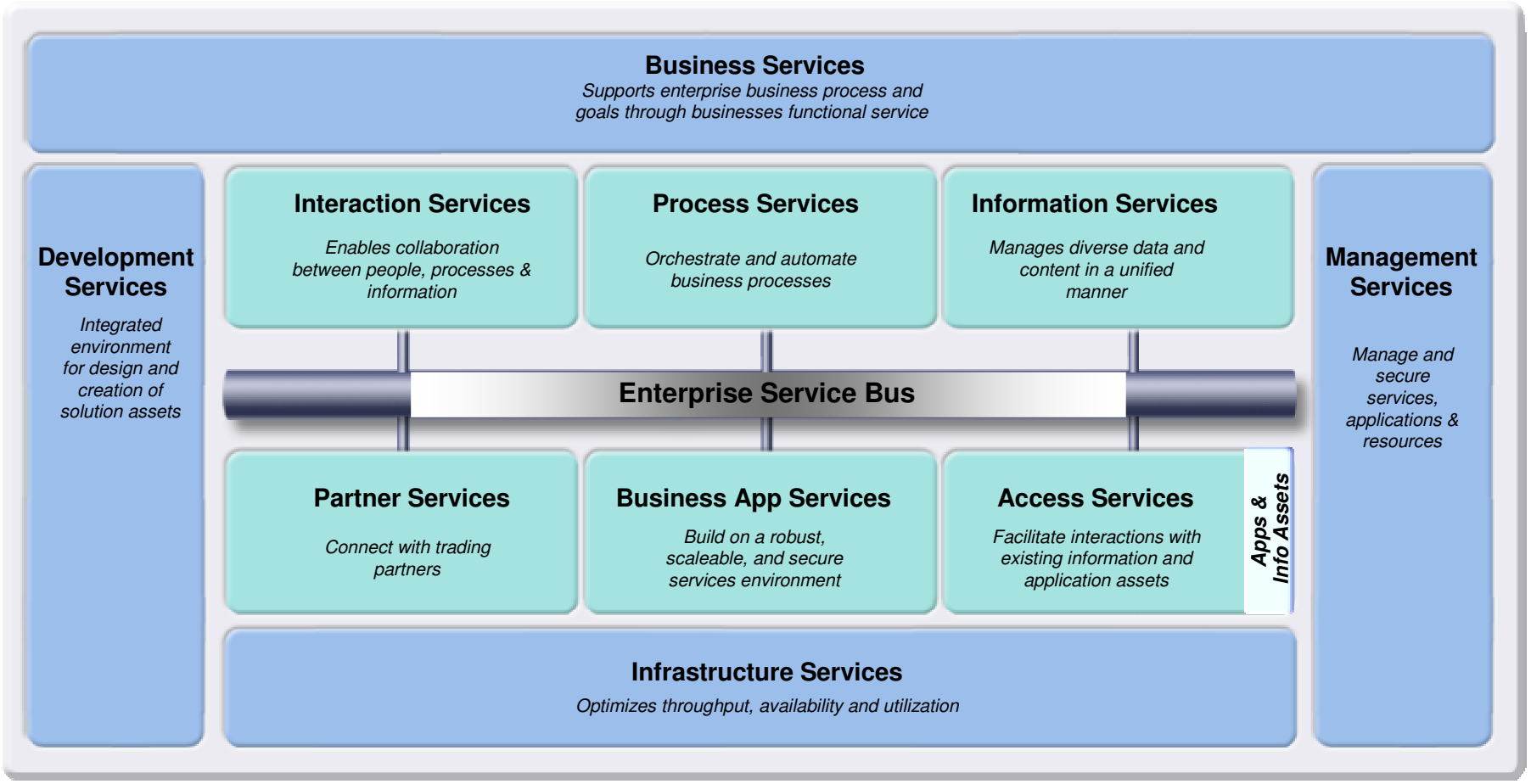
- Gather requirements
- Model & Simulate
- Design

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

- Financial transparency
- Business/IT alignment
- Process control

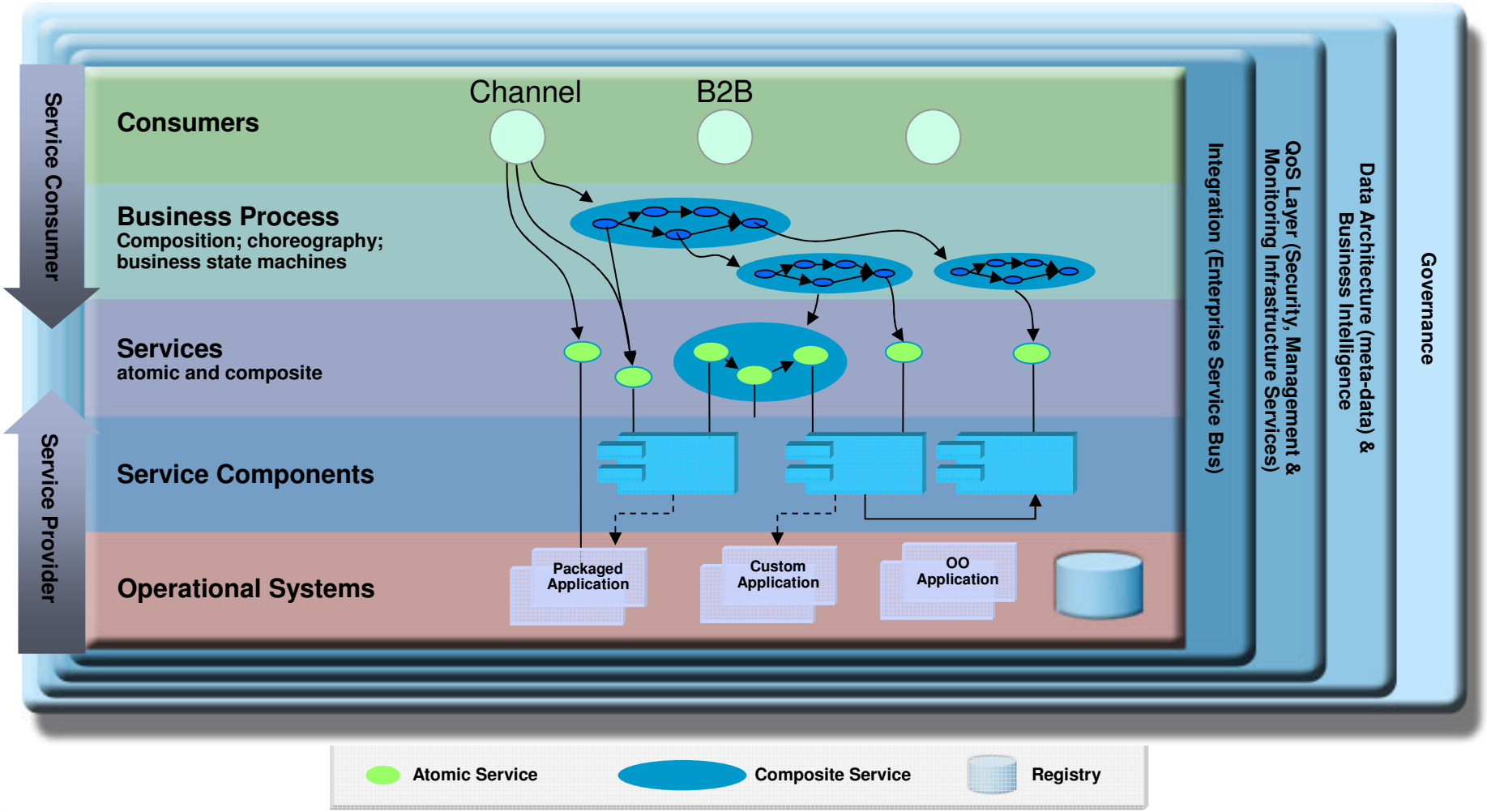
# SOA Reference Architecture

*Supporting the SOA Lifecycle*

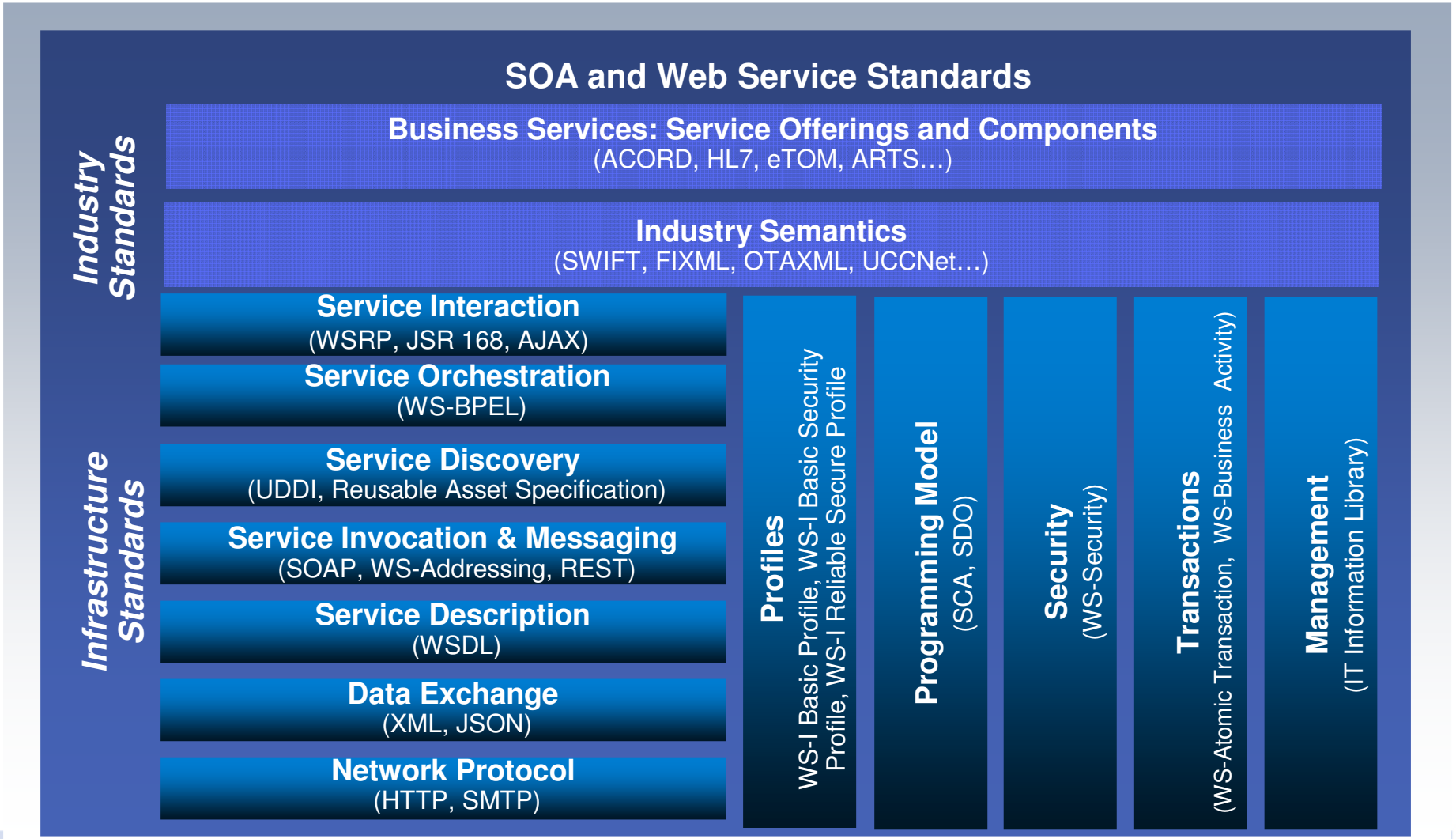


# SOA Solution Layering

*Leveraging the SOA Reference Architecture*



# Key Standards for SOA

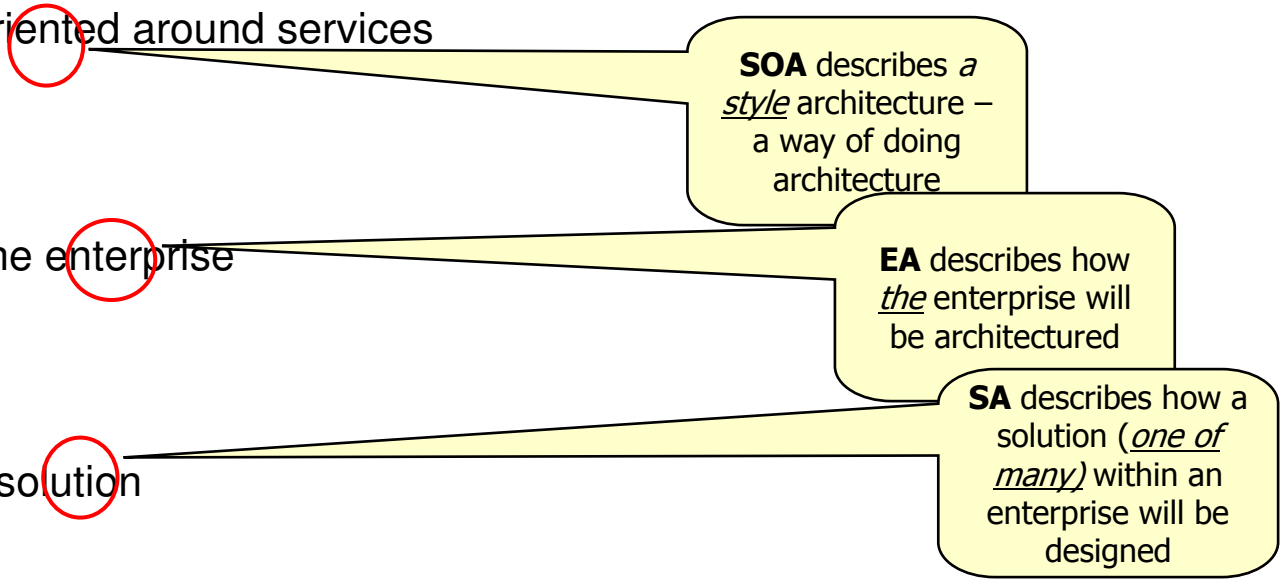


# What are EA and SOA (and Solution Architecture)?

**SOA**: Architectures oriented around services

**EA**: Architecture for the enterprise

**SA**: Architecture of a solution




All three embrace

- Business Architecture – putting bits of business together
- IS Architecture – putting bits of business dependant IT together
- Technology Architecture – putting bits of business independent IT together

# What are EA and SOA (and Solution Architecture)?

**SOA**: Architectures oriented around services

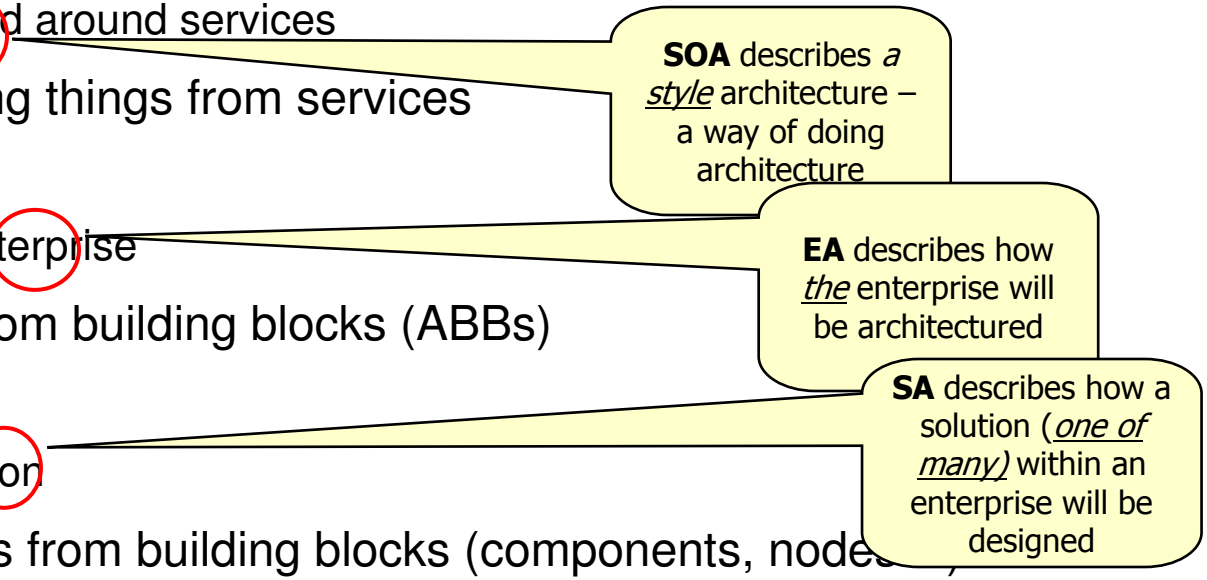
An approach to building things from services

**EA**: Architecture for the enterprise

How things are built from building blocks (ABBs)

**SA**: Architecture of a solution

Building specific things from building blocks (components, nodes)



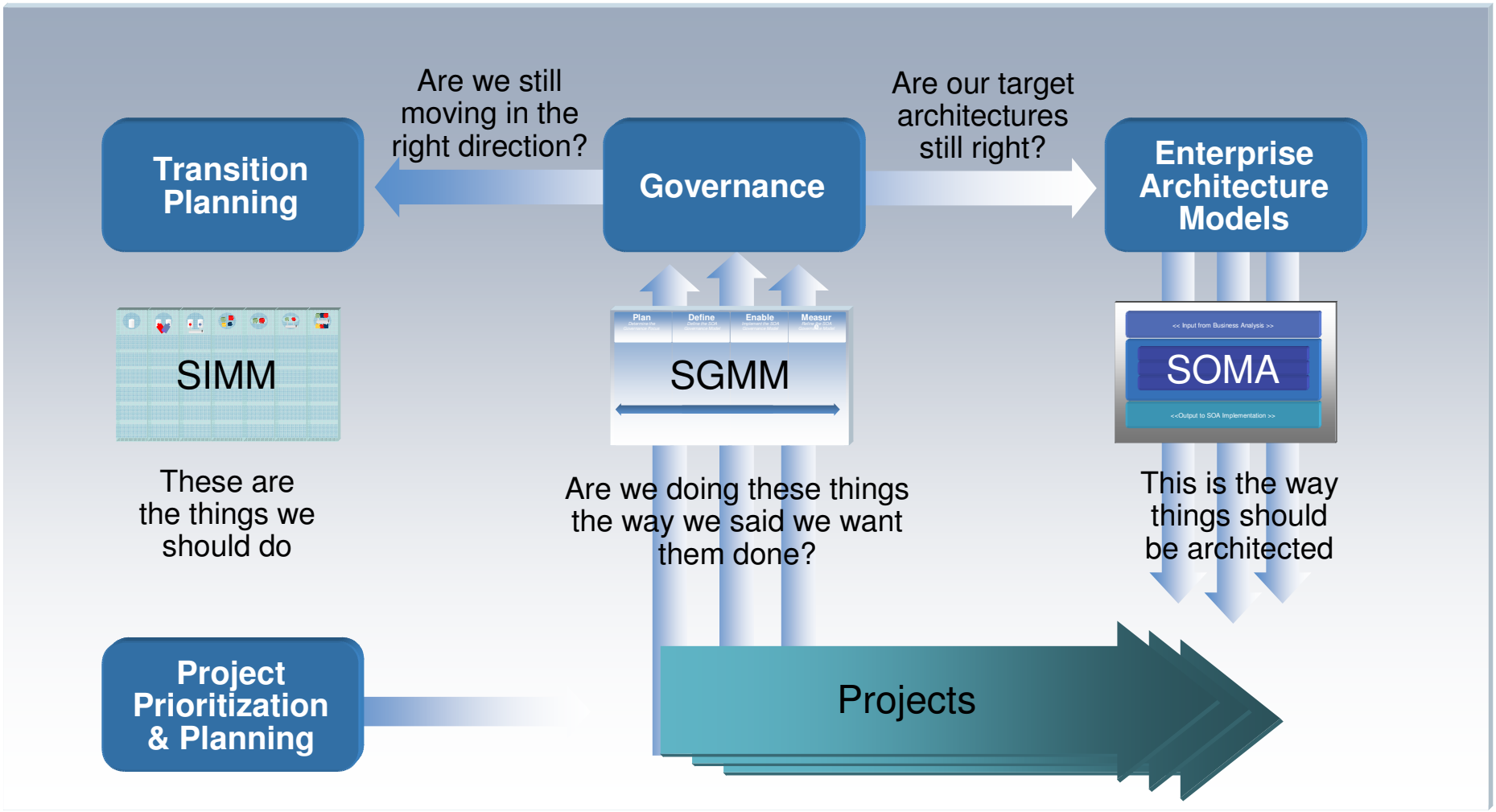

All three embrace

Business Architecture – putting bits of business together

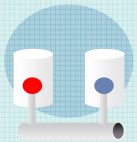
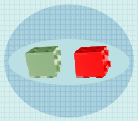
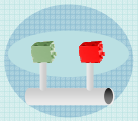
IS Architecture – putting bits of business dependant IT together

Technology Architecture – putting bits of business independent IT together

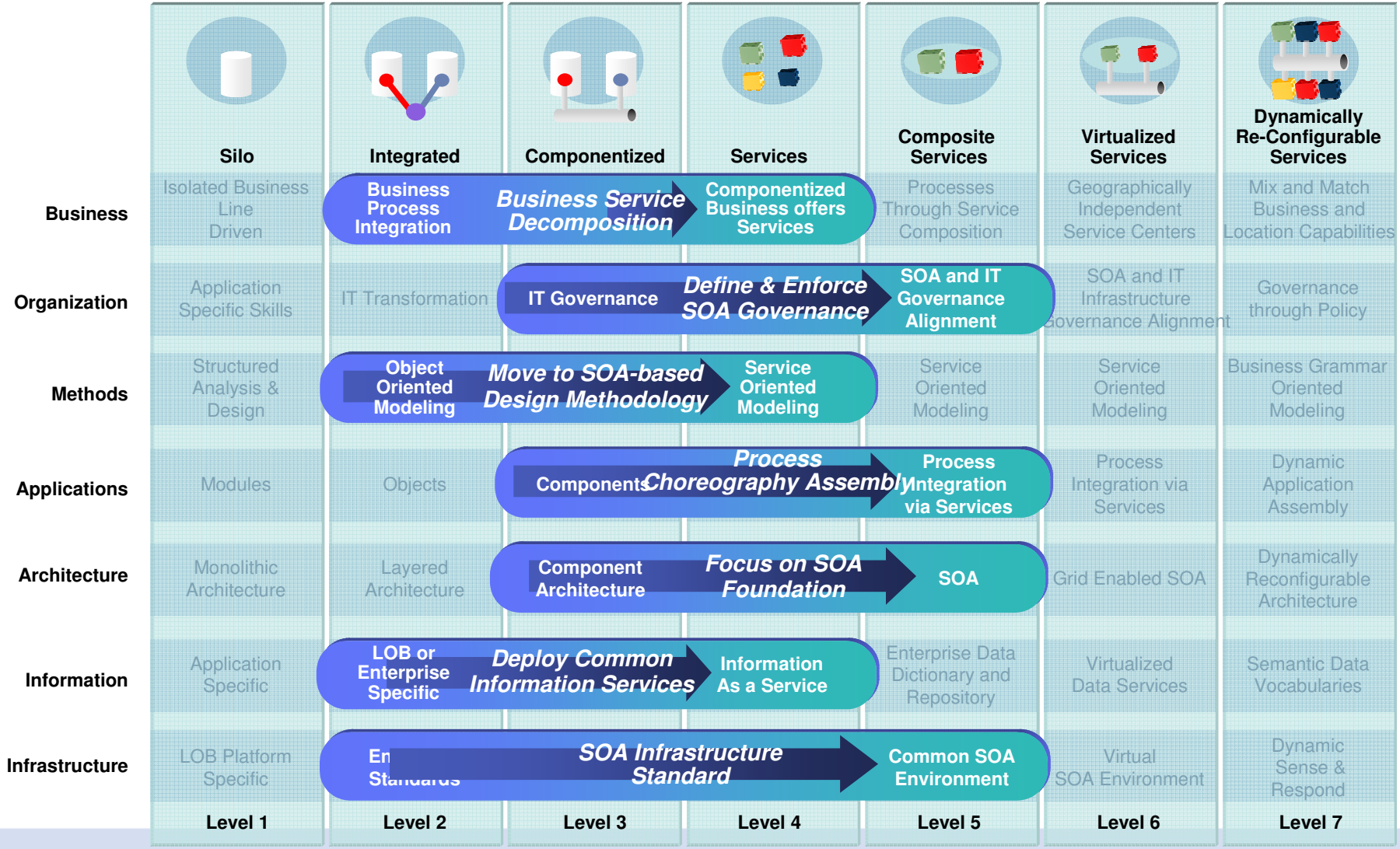
# SOA and Enterprise Architecture: Best Practices



# Service Integration Maturity Model (SIMM)

| | | |  | |  |  | |
|---|---|---|---|---|---|---|---|
| | **Silo** | **Integrated** | **Componentized** | **Services** | **Composite Services** | **Virtualized Services** | **Dynamically Re-Configurable Services** |
| **Business** | Isolated Business Line Driven | Business Process Integration | Componentized Business | Componentized Business offers Services | Processes Through Service Composition | Geographically Independent Service Centers | Mix and Match Business and Location Capabilities |
| **Organization** | Application Specific Skills | IT Transformation | IT Governance | Emerging SOA Governance | SOA and IT Governance Alignment | SOA and IT Infrastructure Governance Alignment | Governance through Policy |
| **Methods** | Structured Analysis & Design | Object Oriented Modeling | Component Based Development | Service Oriented Modeling | Service Oriented Modeling | Service Oriented Modeling | Business Grammar Oriented Modeling |
| **Applications** | Modules | Objects | Components | Services | Process Integration via Services | Process Integration via Services | Dynamic Application Assembly |
| **Architecture** | Monolithic Architecture | Layered Architecture | Component Architecture | Emerging SOA | SOA | Grid Enabled SOA | Dynamically Reconfigurable Architecture |
| **Information** | Application Specific | LOB or Enterprise Specific | Canonical Models | Information As a Service | Enterprise Data Dictionary and Repository | Virtualized Data Services | Semantic Data Vocabularies |
| **Infrastructure** | LOB Platform Specific | Enterprise Standards | Common Reusable Infrastructure | Project-based SOA Environment | Common SOA Environment | Virtual SOA Environment | Dynamic Sense & Respond |
| | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** | **Level 7** |

# Service Integration Maturity Model (SIMM)



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# Service Oriented Modeling and Architecture (SOMA)

*Links Business Intent with IT Implementation*

- SOMA gets inputs from business analysis activities, and produces outputs necessary for SOA implementation
- The analysis and modeling performed during SOMA is **technology and product agnostic**, but establishes a context for making technology and product specific **decisions** in later phases of the lifecycle

Ensures business characteristics e.g goals & KPIs auditably carried fwd into the IT analysis and architectural decisions.



***SOMA > continuity between the business intent and IT implementation***

# SOA Governance & Management Method (SGMM)

*IBM's Comprehensive Approach to SOA Governance*

| Plan | Define | Enable | Measure |
|---|---|---|---|
| *Determine the Governance Focus* | *Define the SOA Governance Model* | *Implement the SOA Governance Model* | *Refine the SOA Governance Model* |
| Tailor method for goals/environment | Define and refine governance processes | Implement the transition plan | Measure effectiveness governance processes |
| Understand current Governance structures<br>Define scope of governance<br>Conduct change readiness survey | Define organizational change<br>Define IT changes in SOA development | Initiate SOA Org Changes<br>Launch the SOA Center of Excellence<br>Implement infrastructure for SOA | Measure effectiveness of organization change<br>Review and refine operational environment |

***Continuous SOA Governance Process Measurement & Improvement***

| | | | |
|---|---|---|---|
| *Define the scope of governance: business, development governance or service management or all of the above* | *Define new governance processes for services and define SOA governance mechanisms such as the SOA Center of Excellence* | *Begin implementation of the SOA Center of Excellence, Skills Enablement, Organizational Change, Infrastructure Change, etc.* | *Monitor composite application performance and adjust; Monitor effectiveness of governance changes* |

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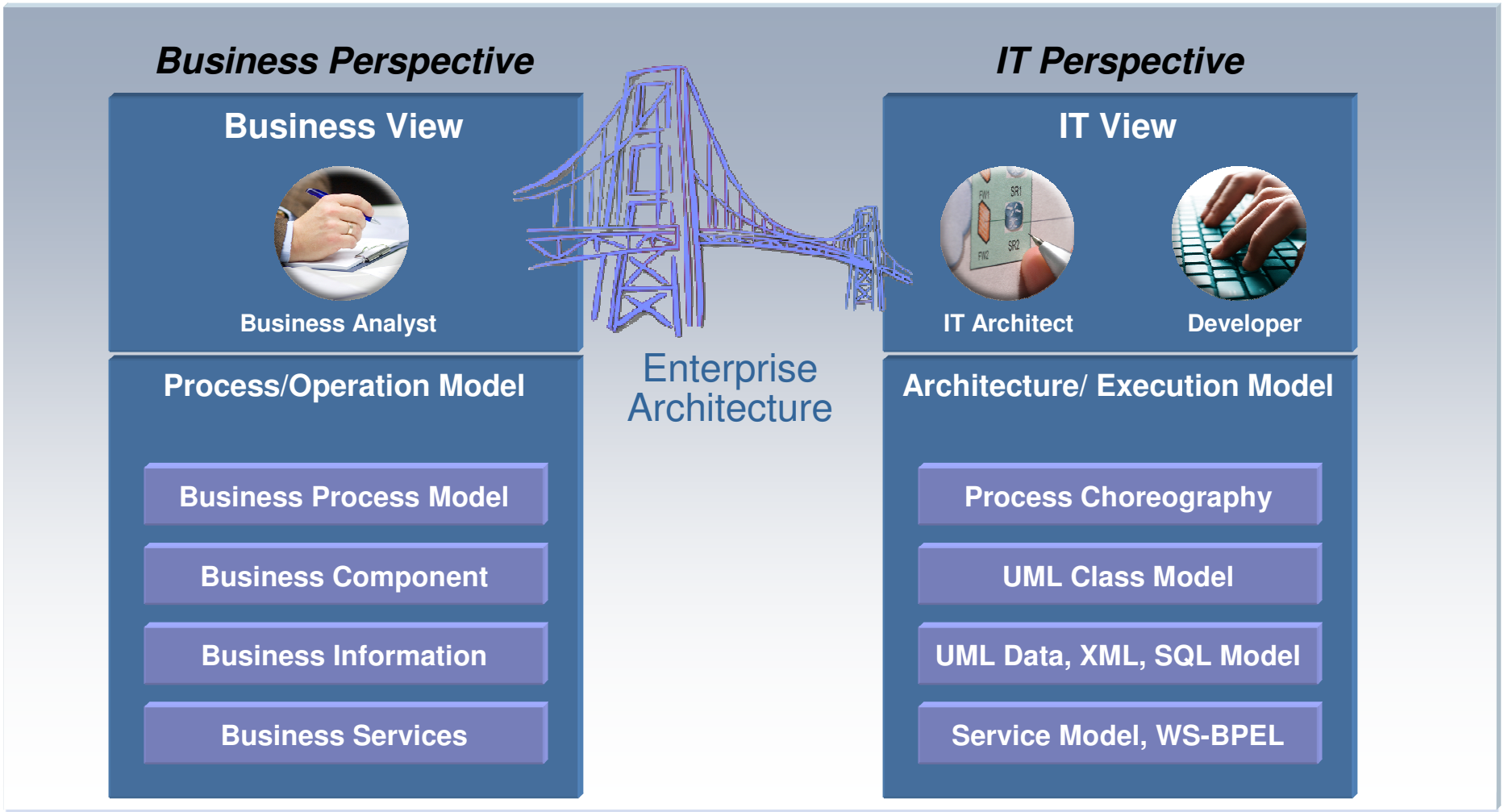
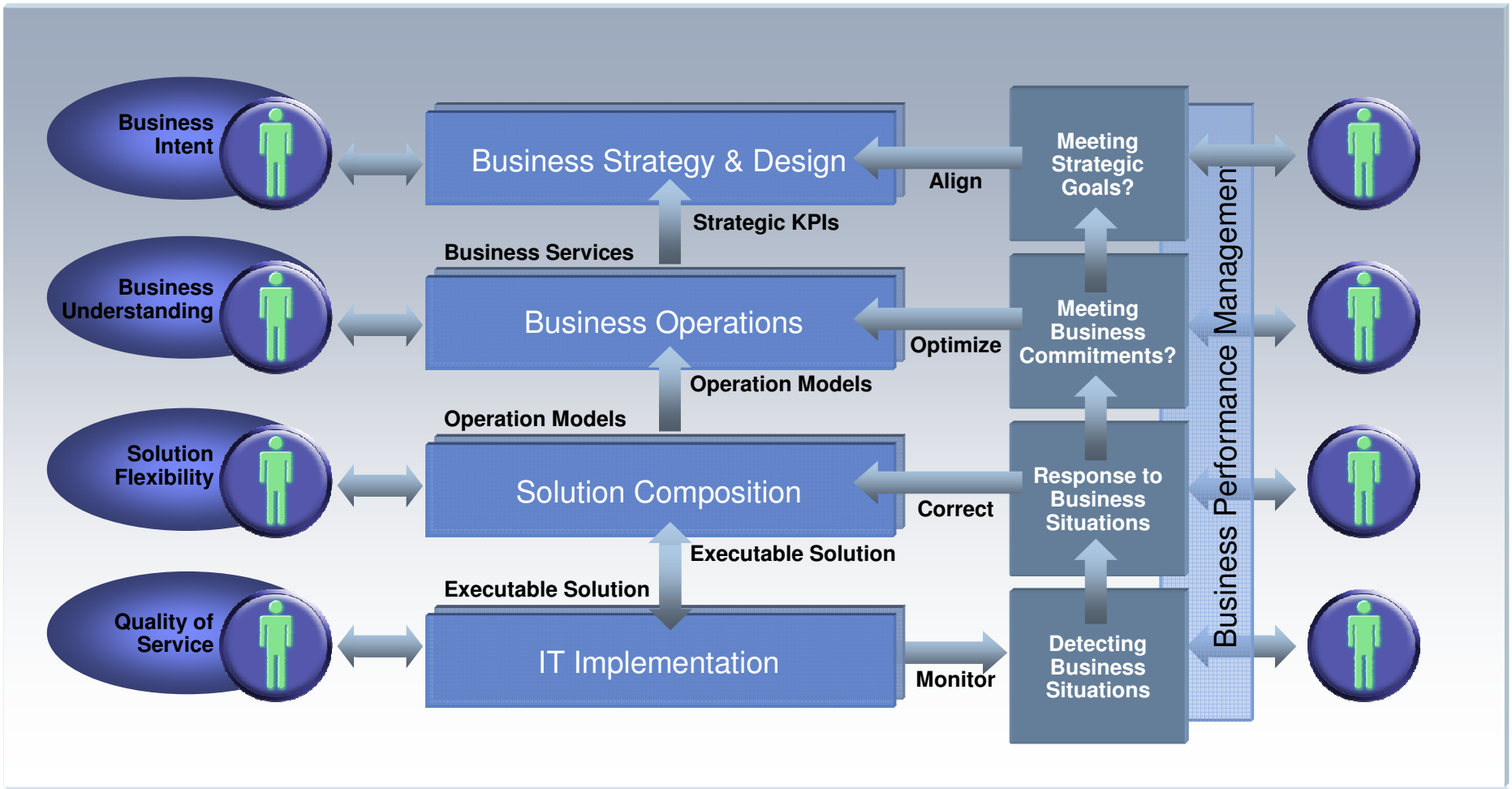
# Enterprise Architecture Links Business and IT

*Reconciling Business Requirements and IT Capabilities*



# Business Strategy Drives IT Decisions

*IT's Goal is to Flexibly Support Business Requirements*



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# STYLE, brings with it a fresh opportunity to do something architects have aspired to do for ages…

"SOA": could stand for *Same Old Architecture*

After all, it's a way of describing, organising and structuring a set of building blocks according to certain rules into computer systems, just like

Mainframe/dumb screen; client-server; distributed computing; e-commerce…

BUT, in each of these architectures…

What is the nature of the building blocks?

A specification?

An implementation?

For development?

In operation?

*Isn't this the promise of SOA?!*

And what is their Scope of reuse?

- System?
- Line of Business?
- Enterprise?
- Industry?

*Provision separated from consumption*

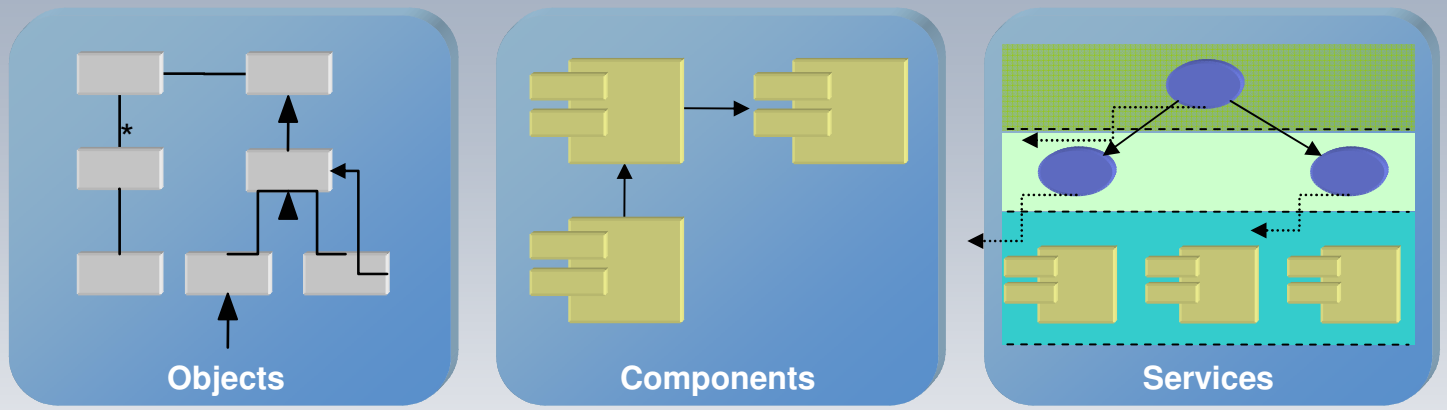
So "SOA" c*ould* be adjusted to be **SSOAA**

***S**eparation of **S**ervice **O**peration from **A**pplication **A**ggregation across the enterprise:*

*SOA enables us to more readily separate the **operational provision** of a set of building blocks from the **variety of uses** in which they are consumed.*

# Service-Oriented Design Is An Evolutionary Approach

Building a service-oriented architecture requires more than just a list of services. It requires conceptualization, identification, specification and realization of services that bridge business and IT together in the SOA paradigm – back to SOMA!

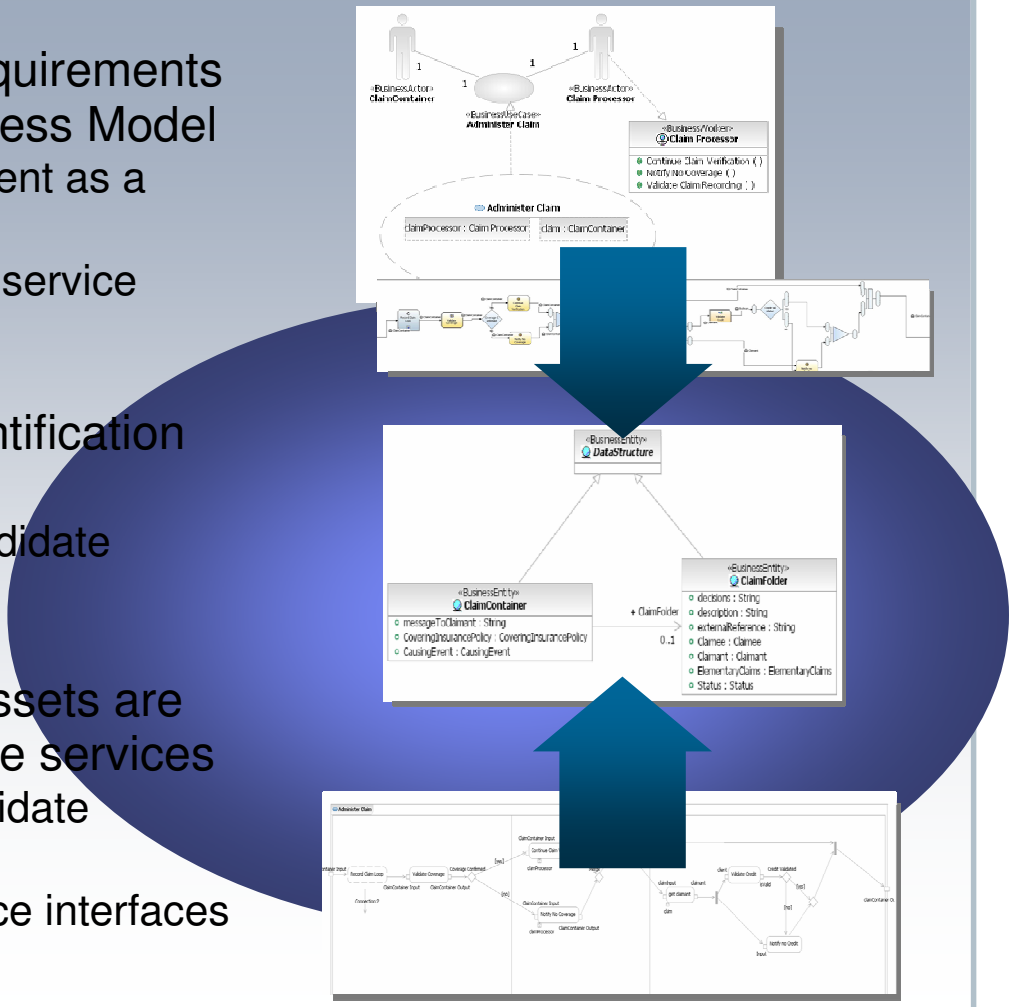



**Object-Oriented** **Component-Based** **Service-Oriented**

- SOA **builds on** well-established software architecture principles
  *(such as information hiding, modularization and separation of concerns)*
- SOA **adds** additional aspects
  *(including SOA interaction patterns, service registries, reuse considerations)*
- Service-oriented modeling **needs** techniques to support these aspects
  *(service identification, specification, realization and implementation techniques)*

# Service Oriented Analysis, Modeling, and Design

- Top Down Approach – Business Requirements can be rendered as a Business Process Model
  - Articulate and model the business intent as a process
  - Process model becomes an input for service design
- Meet-In-The-Middle Approach – Identification of business goals and sub-goals
  - Goals and sub-goals correlate to candidate services
- Bottom Up Approach – Existing IT assets are discovered and evaluated as possible services
  - Identify existing components as candidate services
  - Assets can be transformed into service interfaces and implementations



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# BUT we need to recognise that enterprise wide services can be identified in many ways

**S**ilo **O**riented **A**pproach

- Good architectural thinking … n projects

  Opportunisti… …ide service provision

  E… …plement and operate, within a solution context

  Solu… …chitects engage with Enterprise Architects

Bottom up, opportunistic

**S**ystematic, **O**rchestrated **A**pproach

- Good architectural thinkin… …n projects

  Orchestrat… …se wide service provision

  E… …der to implement and fund, across solution contexts

  Ent… …e Architects engage with Solution Architects

Top down, orchestrated

*Whichever way,*

*There's probably a new role in town, that alters the dynamics of architecture governance!*

# This suggests we need to adjust our traditional "EA – SA" governance model

**Enterprise Architects**

Identify and specify the enterprise's IT building blocks, reference patterns, principles of construction, etc. for use across separate business solutions

**Solution Architects**

Exploit the enterprise's IT building blocks in the specification and implementation of solution specific IT systems

*a.k.a. Systems Architects?*

**Service Architects**

Oversee the design, implementation and operation of specific application and technical services, for the benefit of the enterprise

*a.k.a. Component Architects?*



***Use your instant response gadget now! What do you think?***

# Agenda

This is - given timings & need for me not to delay you having coffee ☺
- "just" a set of markers.

- SOA and Enterprise Architecture
- SOA Business Architecture Considerations
  - Business Strategy
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# Business Component Analysis

The enterprise is mapped out as a set of categorized business components
Heat map highlights components for analysis based on criteria such as gaps and efficiency
Enables approaches to understanding how the business can be improved

| | Business Administration | New Business Development | Relationship Management | Servicing & Sales | Product Fulfillment | Financial Control and Accounting |
|---|---|---|---|---|---|---|
| Directing | Business Planning | Sector Planning | Account Planning | Sales Planning | Fulfillment Planning | Portfolio Planning |
| Controlling | Business Unit Tracking | Sector Management | Relationship Management | Sales Management | Fulfillment Monitoring | Compliance |
| | Staff Appraisals | Product Management | Credit Assessment | | | Reconciliation |
| Executing | Account Administration | Product Directory | Credit Administration | Sales | Product Fulfillment | Customer Accounts |
| | Product Administration | Marketing Campaigns | | Customer Service | Document Management | General Ledger |
| | Purchasing | | | | | |
| | Branch/Store Operations | | | Collections | | |



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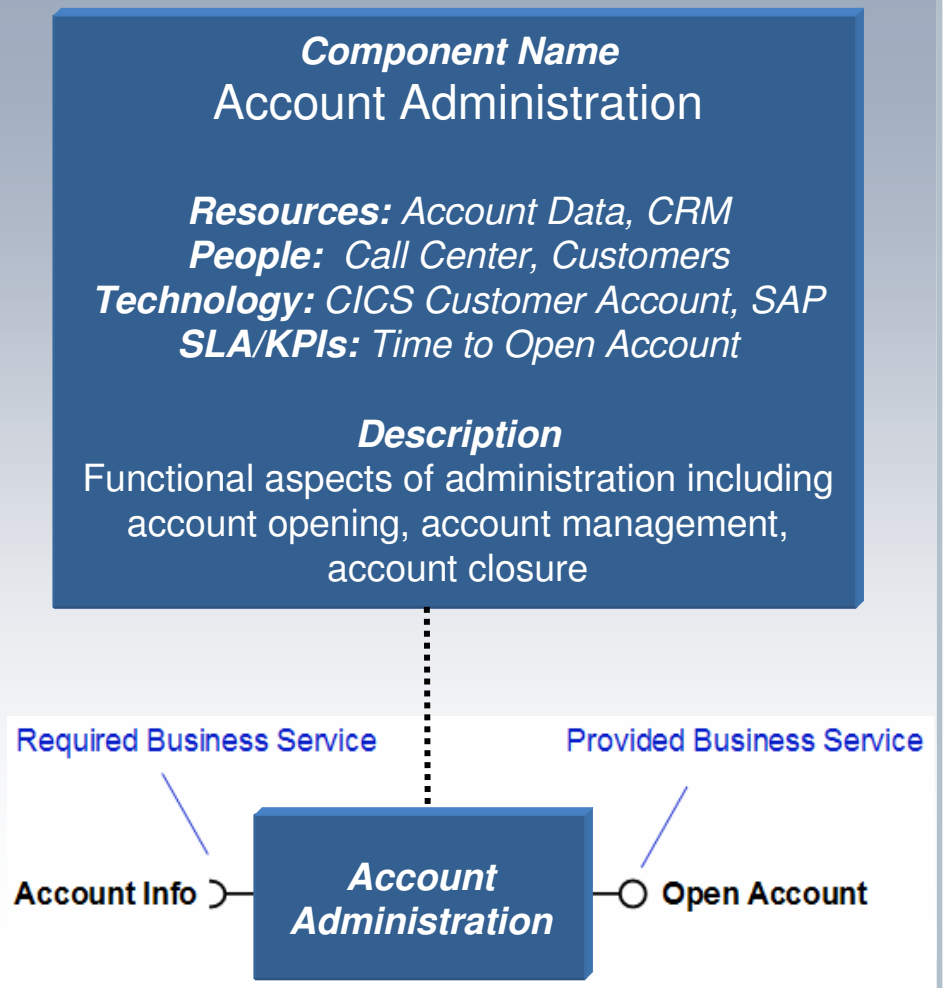
# Business Components Define The Key Business Functions

A **business component** is
**"a grouping of the people, technology, & resources delivering specific business value"**

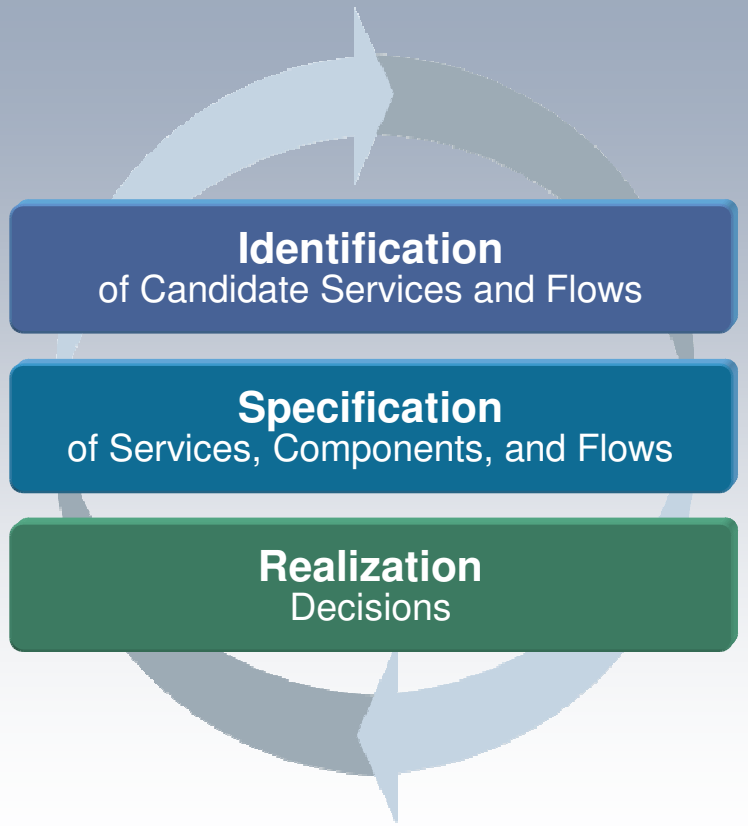
Components have well-defined interfaces, allowing them to interact smoothly with each other and to be 'snapped' in and out at will, like building blocks"

The Interfaces of the Business Components Enable Identification of Candidate Business Services



# SOMA (Service Oriented Modeling and Architecture) *Identification, Specification, Realization and Implementation of Services, Components and Flows*

- **SOMA is IBM's end to end SOA Solution development method**
- SOMA is an integral part of the Rational Unified Process
  - UML Profile for Software Services
  - RUP SOMA
- SOMA has the following phases:
  - Service Identification
  - Service Specification
  - Service Realization



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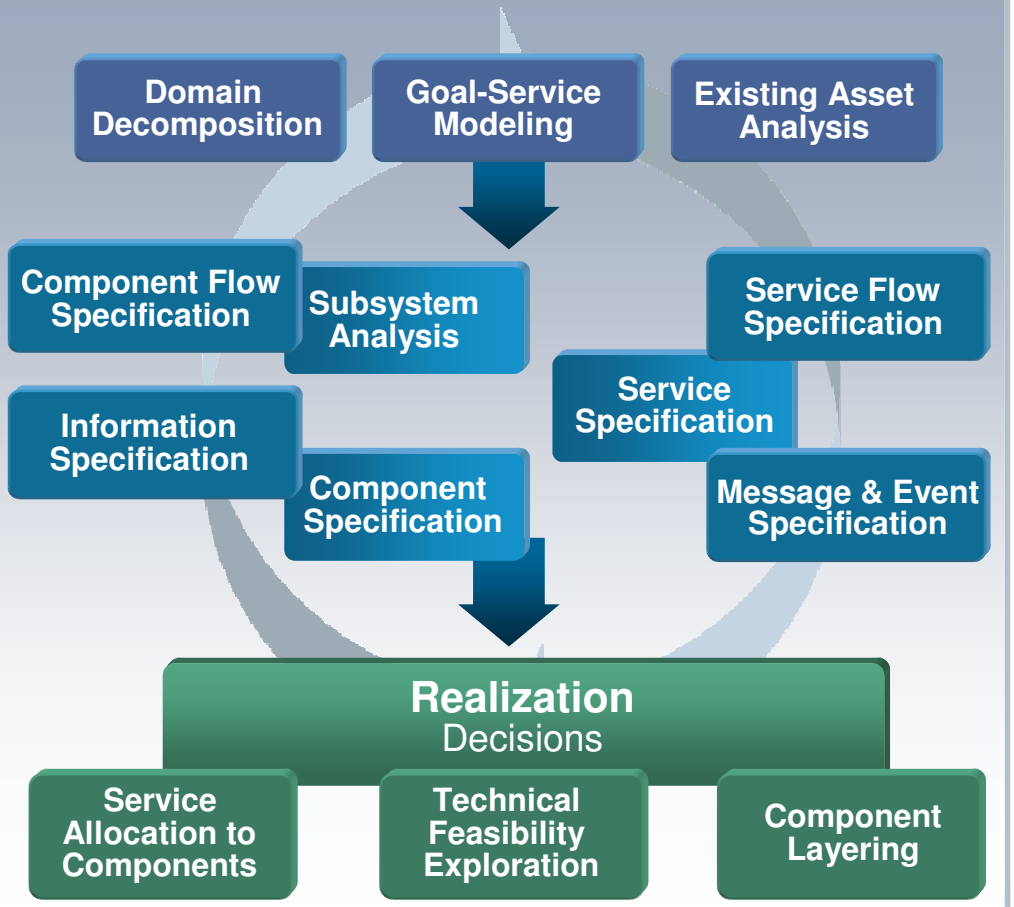
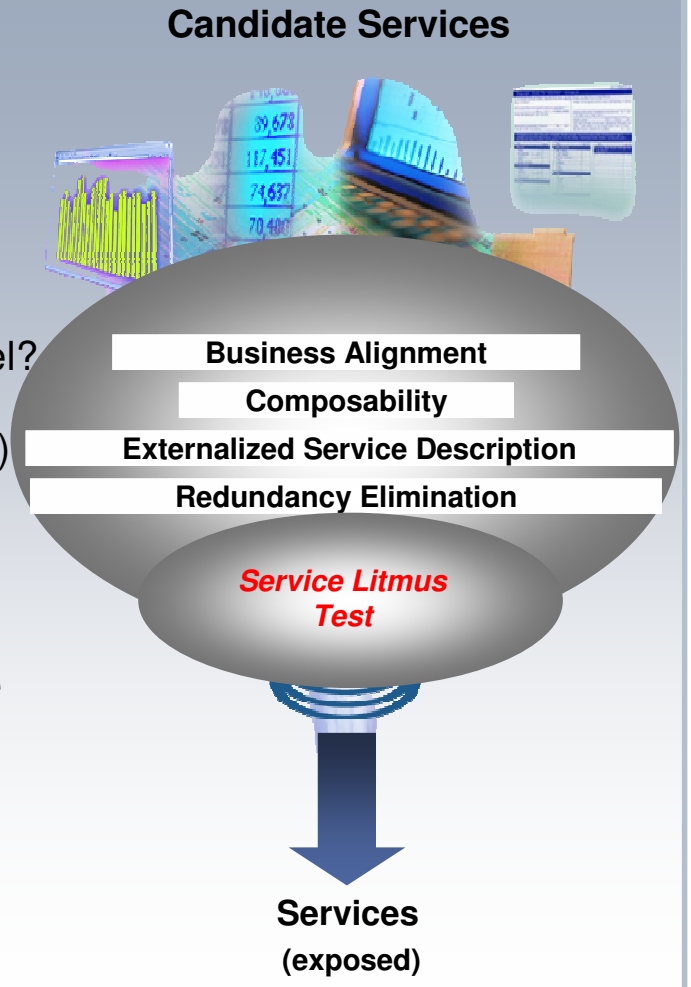


# Service Exposure Decisions Within Service Specification

- Business Alignment:
  - Is the service business relevant?
  - Is funding available for service development and management?
  - Is the service sharable?
- Composability
  - Is the service consistent with NFRs at the composite level?
  - Is service stateless?
  - Is the service self-contained? (Are there dependencies?)
  - Is the service technology neutral?
- Externalized Service Description
  - Is there an externalized service description e.g. WSDL?
  - Can the service be discovered and bound via the service description?
  - Does the description contain meta-data about itself?
- Redundancy Elimination
  - Can the service be applied to all processes where its function is required?

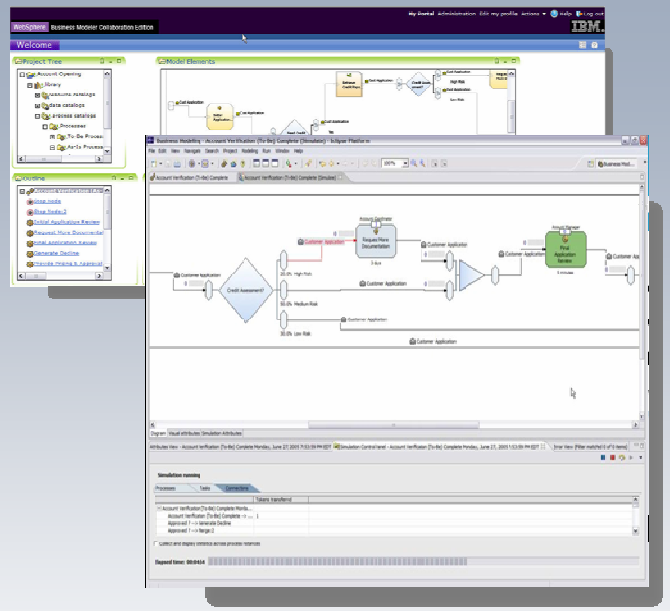





***Use your instant response gadget now! Do you apply a litmus test?***

# Developing Business Process Models

- Enable business users to graphically model processes
- Support documentation and training for the organization and external parties
- Support simulation and analysis to substantiate process design decisions
- Generate code artifacts to support IT implementation of processes



**Architectural Benefit**:

- Support top-down approach to service and process design
- Coordination of process development across business stakeholders as well as interaction with IT organization to articulate process design
- Creation of artifacts to support process development and implementation



***Key here is MDA – don't want to overload the gadget…***

# Composite Business Services

*Business Services Provide the "Building Blocks"*

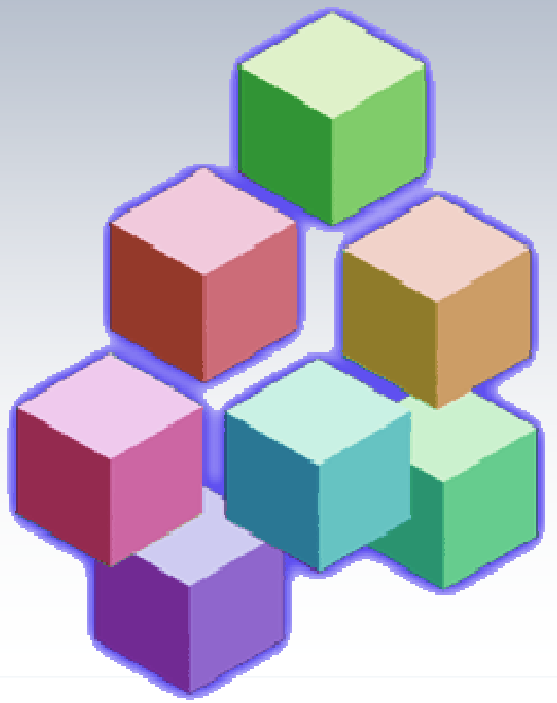
***Composite Business Services definition:***

A collection of integrated and related business services that provide a specific business solution and support business processes built on SOA

***Business Services definition:***

A business function whose execution can be adapted at runtime based on business policy and user context

- Designed at business level to represent a discrete business function (e.g. check credit, open account)
- Can provide flexible, adaptable behavior based on business policy and user context
- Provisioned through multiple communication channels



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***Lots!!!***

# IBM SOA Service Offerings

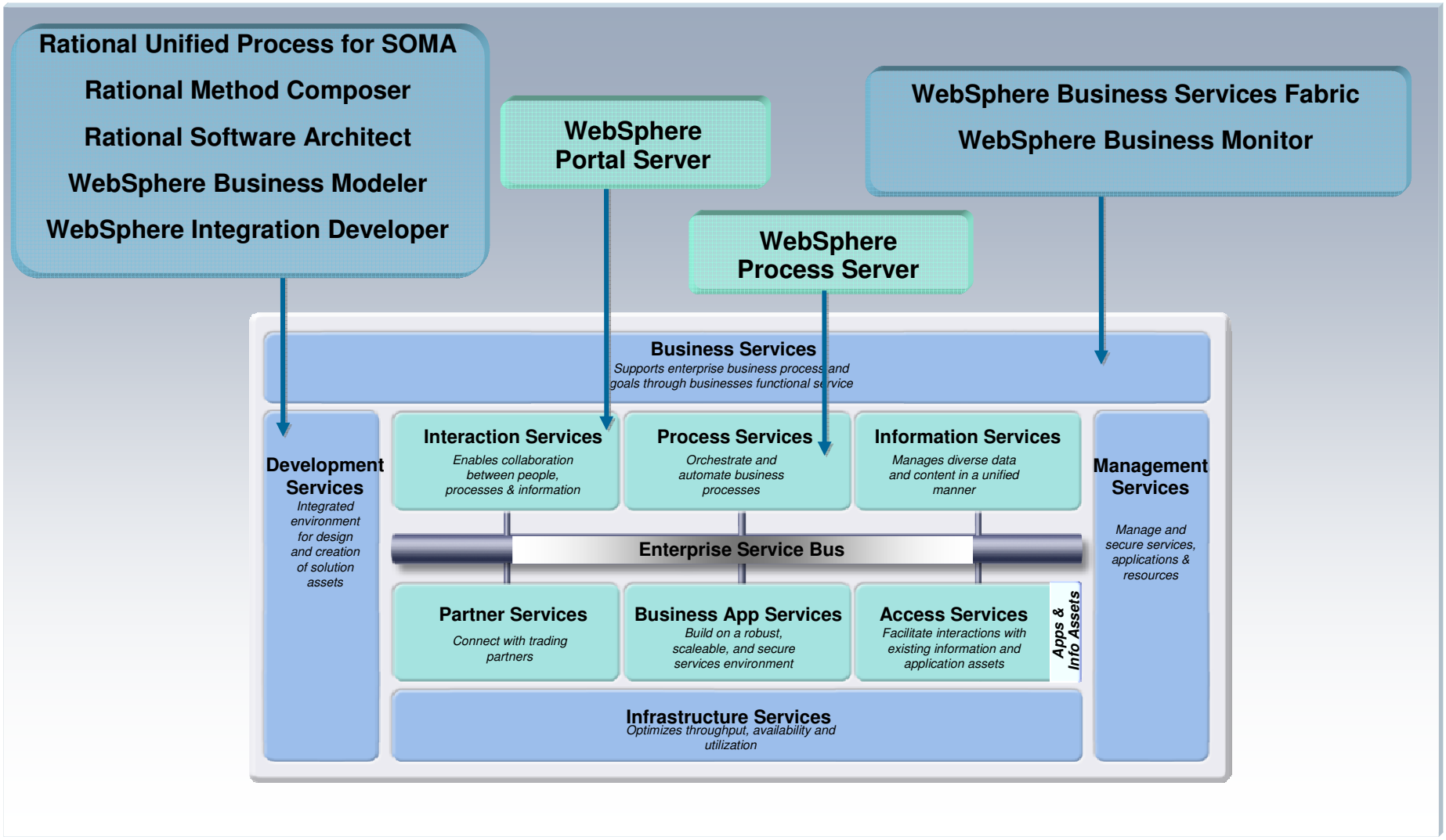
*Focused on SOA Business Architecture*

| | |
|---|---|
| **SOA Strategy** | How do I get started in SOA? |
| **SOA Diagnostic** | I've started with SOA, how am I doing? What can I do better? |
| **SOA Implementation Planning** | There is a specific Business Area I want to improve using SOA – how should I approach it? |
| **Business Process Management (BPM) Enabled by SOA** | How can I leverage SOA to implement and improve business processes that meet my performance objectives, make better use of IT resources and give me a competitive edge? |
| **SOA Design, Development and Integration Services** | I've done the preliminary planning work, now I'm ready to develop and sustain SOA solutions |
| **SOA Management** | I've implemented SOA-based solutions, how can I manage them effectively to ensure ongoing benefit realization? |

# GBS Representation of the SOA Offerings At-A-Glance

| SOA Strategy | SOA Diagnostic | SOA Implementation Planning | BPM Enabled by SOA | SOA Design, Development, and Integration Services | SOA Management Services |
|---|---|---|---|---|---|
| **Intended Audience**<br><br>CIOs and CxOs | **Intended Audience**<br><br>CIOs, Line of Business (LOB) Managers | **Intended Audience**<br><br>LOB or Application Group Managers; CIOs, SOA Champions | **Intended Audience**<br><br>Line of Business, CEOs | **Intended Audience**<br><br>LOB or Application Group Managers; CIOs and CEOs | **Intended Audience**<br><br>LOB or Application Group Managers; CIOs and other CxOs who champion management services |
| **Average Engagement Length**<br><br>6-16 Weeks | **Average Engagement Length**<br><br>4-6 Weeks | **Average Engagement Length**<br><br>6-12 Weeks | **Average Engagement Length**<br><br>4 Months to 1 Year | **Average Engagement Length**<br><br>6 Months to 1 Year | **Average Engagement Length**<br><br>Ongoing |
| **Key Deliverables**<br>▪ SOA Vision<br>▪ SOA Diagnostic Report<br>▪ SOA Reference Architecture<br>▪ SOA Governance Framework<br>▪ SOA Roadmap<br>▪ SOA Business Value Report | **Key Deliverables**<br>▪ SOA Maturity Assessment<br>▪ SOA Business Process Management Review<br>▪ SOA Technical Review | **Key Deliverables**<br>▪ SOA Future Business Process Model [High Level]<br>▪ Solution Architecture Overview [Solution Outline]<br>▪ SOA Governance Model & Plan [High Level]<br>▪ SOA Implementation Plan | **Key Deliverables**<br>▪ Current State Process Definition (As Is)<br>▪ Future State Process Definition<br>▪ Current IT Assessment<br>▪ High-Level Service Model | **Key Deliverables**<br>▪ SOA Pilot Implementation<br>▪ ESB Implementation<br>▪ L2SOA implementation<br>▪ Business Service Reuse<br>▪ SOA Security<br>▪ Business Process Automation<br>▪ SOA Center of Excellence<br>▪ SOA Governance Framework | **Key Deliverables**<br>▪ SOA Management Transition Plan & Signoff<br>▪ SOA Service Support<br>▪ Required SOA Solution Management Reports<br>▪ Managed SOA Governance Model<br>▪ SOA Governance Compliance Reports<br>▪ SOA Governance Model Adoption Support |
| **Previous Clients**<br><br>Toyota, Wachovia, Visa, Partners HealthCare, FFIC | **Previous Clients**<br><br>Sony, Wachovia, Fireman's Fund, Avis, Wells Fargo Bank | **Previous Clients**<br><br>Discover, Wachovia, FFIC, Visa, UPS, Toyota | **Previous Clients**<br><br>UPS, Wachovia, Visa, Circuit City, FFIC, Toyota, PG&E | **Previous Clients**<br><br>UPS, Wachovia, Visa, Circuit City, FFIC, Toyota, PG&E | **Previous Clients**<br><br>FFIC |
| **Bottom Line**<br><br>**Develop a SOA** Strategy, Architecture, Business Case, Governance Framework, and Roadmap to guide the transformation of an organization and systems towards a service-oriented model. | **Bottom Line**<br><br>Assess current state in service orientation and integration, and their desired or future state, for a line of business or enterprise. Conduct business process and architecture health check for projects adopting SOA. | **Bottom Line**<br><br>Establish the high level solution architecture overview, defining the scope in terms of process, service, security and governance. A robust implementation plan is developed for successful realization of the SOA solution. | **Bottom Line**<br><br>Helps the Line of Business improve business performance by transforming the current process design to deliver higher performance once enabled by SOA | **Bottom Line**<br><br>Helps a LOB or Application Group realize business value by providing a suite of SOA services that complement the application implementation lifecycle in every stage of SOA design, development, integration, and implementation. | **Bottom Line**<br><br>Establish the processes, capabilities, roles and responsibilities to effectively manage and monitor the SOA services and infrastructure. |

# IBM Products to Support SOA Business Architecture



# Agenda

- SOA and Enterprise Architecture
- SOA Business Architecture Considerations
  - Business Strategy
  - SOA Design
  - Business Process Management
- SOA Business Architecture Best Practices
- IBM Capabilities to Support SOA Business Architecture
- Summary

***Lots!!!***

# Summary

- Designing SOA with a Business Focus requires:
  - Linking Business and IT – normally through an Enterprise Architecture
  - Applying discipline and rigour to SOA Design
  - Business Process Management to design and implement business relevant services
- Best practices for designing SOA based on a business focus implies:
  - Decomposing the Enterprise into Business Components to design business-relevant service architectures
  - Use of SOMA to ensure an optimized service design for the enterprise
  - Application of tools and techniques to support business process modeling, assembly and deployment, and business process monitoring
  - Development and refinement of SOA Governance to enable a service lifecycle development approach and ensure business/IT linkage for SOA

# SOA Gov and SOA CoE lessons learned

## Lesson #1 – "C-level" Backing Across the Board

*SOA Governance absolutely requires buy-in and active support from the CxO level.*

*Lack of real "C-level" understanding, commitment, and active support for SOA leaves governance efforts impotent*

*CxOs can ensure that SOA stays center stage*

*Leadership absolutely must participate in the early stages of governance*

## Lesson #2 – Establish SOA Funding Model for the Long Term

*There will need to be resources dedicated to SOA.*

*Understaffing SOA Governance or the COE as a token nod to their importance is an SOA killer.*

*Funding for projects must be linked to the governance processes*

*A creative model that rewards the LOB for serving the enterprise at large is essential.*

## Lesson #3 – No SOA Without a Well-Defined EA

*EA artifacts provide the necessary cross LOB visibility required by all parties.*

SOA Governance needs a baseline to manage to

## Lesson #4 – Commitment to Roles, Responsibilities, and Resources

*Some dedicated SOA resources will be necessary*

*Enable enough key resources to make governance effective.*

## Lesson #5 – Get the Message Out

*Involve some folks (S&C) skilled in formal communication and education campaigns.*

*Do some SOA evangelist work*

*The COE's role(s) must be understood, documented, and propagated*

*Collect and Publish Metrics*

## Lesson #6 – Be Ready for SOA

*Take the time to make an impartial evaluation of readiness and start at the right level.*

*Significant project oversight and a deep commitment to SOA aspects is required.*

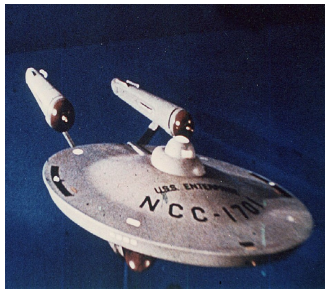
*Involve some Change experts from the beginning*

# So, only when we ensure SOA works “upstream” (identifying the right services) and “downstream” (building and using the right services) will we succeed

## Upstream: Doing the right things

Identifying, funding & resourcing the most important programmes – both service and solution centric, in line with the business strategy and within the investment budget, in the right sequence, and with effective programme management and control.

## Downstream: Doing things right

Ensuring the services and solutions delivered by these programmes meet the needs of the business, work within the existing IT environment and contribute towards the realisation of the enterprise’s IT strategy.

Unless active and agreed decisions are taken to the contrary (tactical design)