

2004

# SOA Throughout the Enterprise and Beyond



**Luba Cherbakov**

IBM Distinguished Engineer  
Member IBM Academy of Technology,  
IBM CIO Office

[lubacher@us.ibm.com](mailto:lubacher@us.ibm.com)

## The SOA buzz hits even Hollywood....



In "*Firewall*"

**SOA Web Service Journal** is Jack Stanfield's favorite trade magazine where you see Harrison Ford reading the magazine in one scene and on the coffee table in his office, in two other scenes.

*Firewall* opened in movie theaters on February 10, 2006

## Today's discussion

**Business Challenges**

**Business Componentization**

**Service Orientation**

**SOA Journey Best Practices**

**Future: Service-Oriented Enterprise (SOE)**

The business environment is undergoing a dramatic change: CEOs recognize that they need to *sense, analyze and respond more effectively* to continuously changing market conditions and risks

## Responsiveness is a new key competence

- Yet very few CEOs rated their organizations' ability to react to these changing conditions and external forces as being very good
- Most CEOs say their organization is **not agile enough** to capture new market opportunities
- **CEOs are aware of the power of IT and the weaknesses that result from lagging behind**

- 4 out of 5 CEOs say **revenue growth** is their top priority
- Two-thirds say growth will come from **innovation**
- More than half look to **new markets** to drive growth
- 80% cite **responsiveness** as a key strategic priority

Sources: IBM Business Consulting Services, The Global CEO Study 2004

## 2006 CEO perspective predicts dramatic innovative change

**Myth: “Flat world” trends only affect a few firms**

**↳ CEOs plan imminent and radical change**

**Myth: Innovation is too critical and proprietary to involve outsiders**

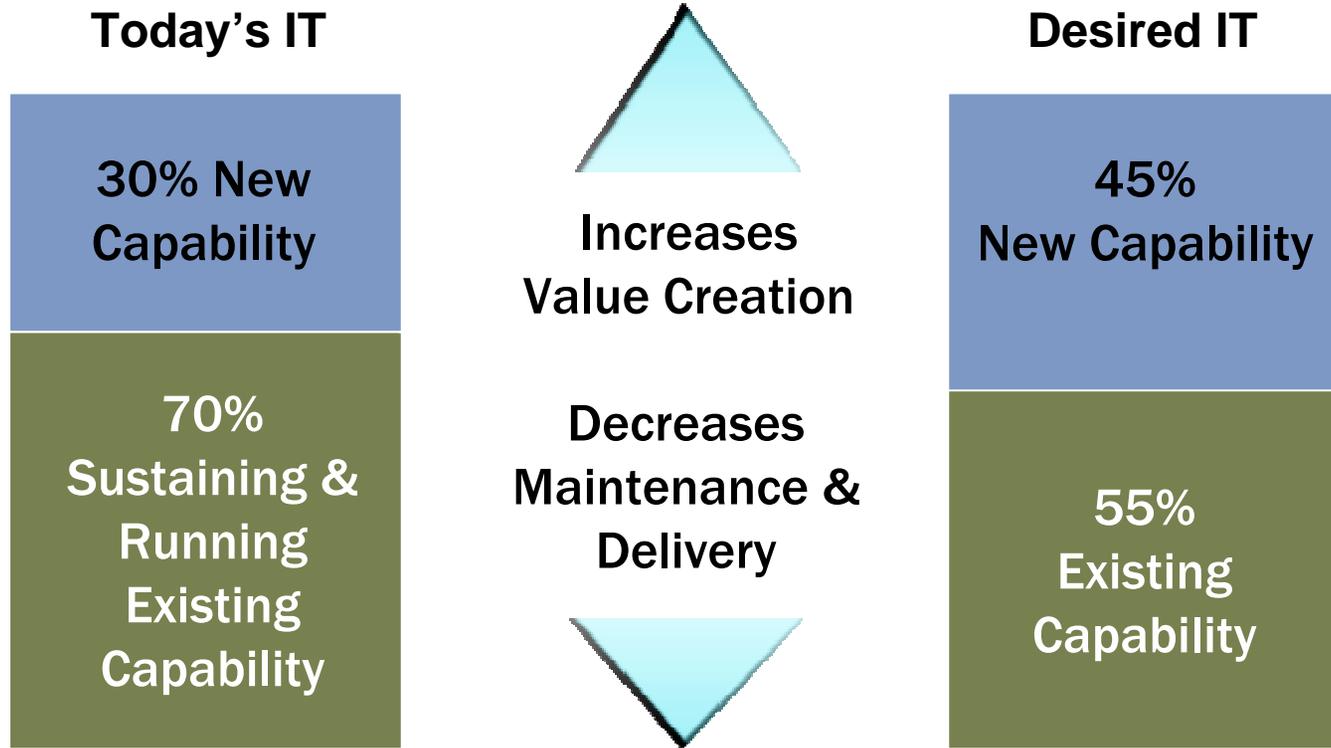
**↳ Collaborative innovation is indispensable**

**Myth: Innovation means inventing new products and services**

**↳ Business model innovation matters**

Sources: IBM Business Consulting Services, The Global CEO Study 2006

## Investment Paradox – Shift the equation



## Today's discussion

**Business Challenges**

**Business Componentization**

**Service Orientation**

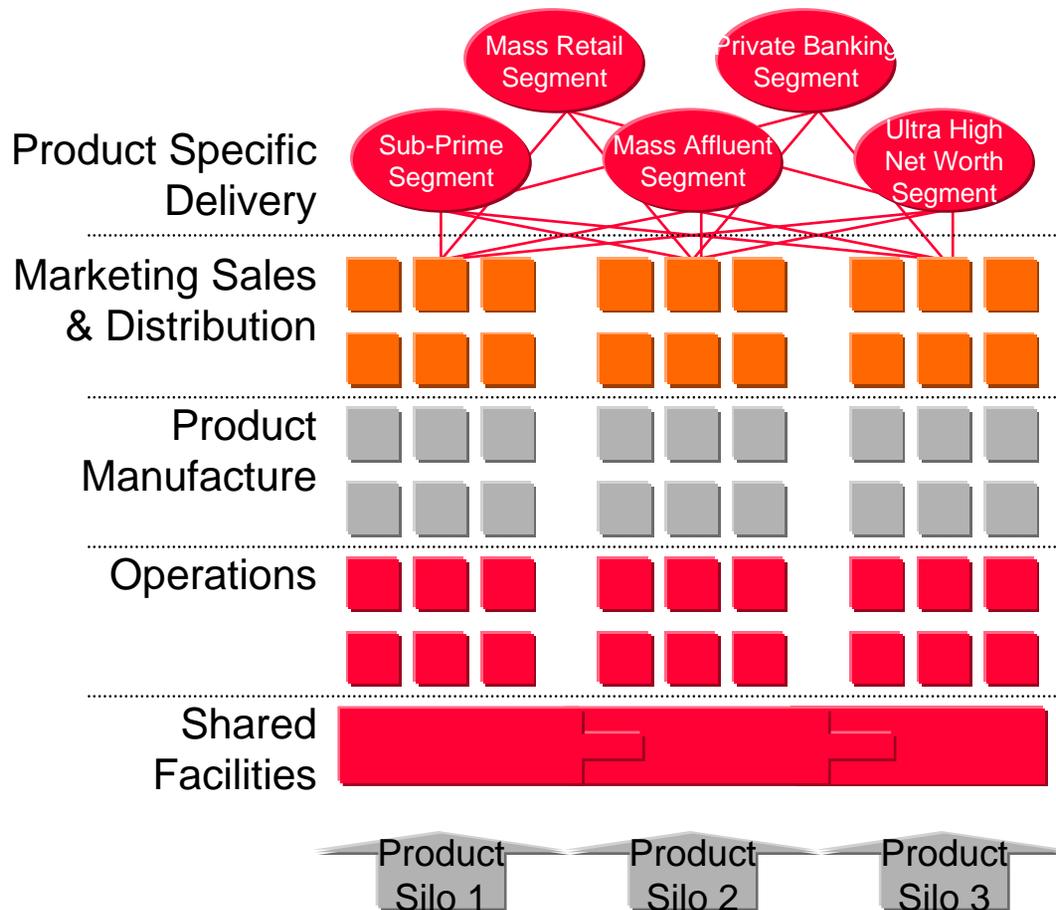
**SOA Journey Best Practices**

**Future: Service-Oriented Enterprise (SOE)**

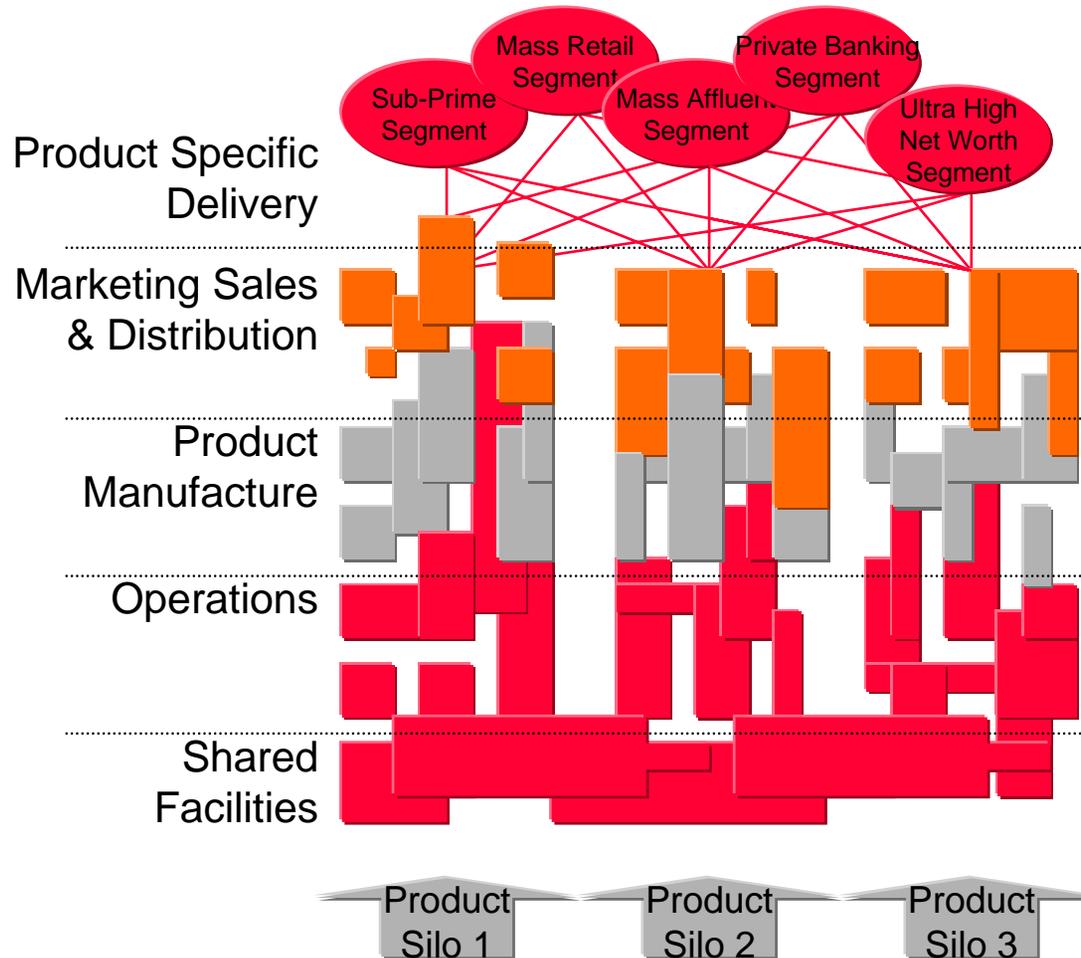
2005 <http://www.research.ibm.com/journal/sj/444/cherbakov.html>

by L. Cherbakov, G. Galambos, R. Harishankar, S. Kalyana, G. Rackham

# The Plan: Seamlessly integrated operations, product manufacture, and delivery capabilities cost-effectively serve discrete customer segments



# The Reality: Disjointed, “silo’d” and overlapping operations, resulting in hit-or-miss efforts to serve target clients



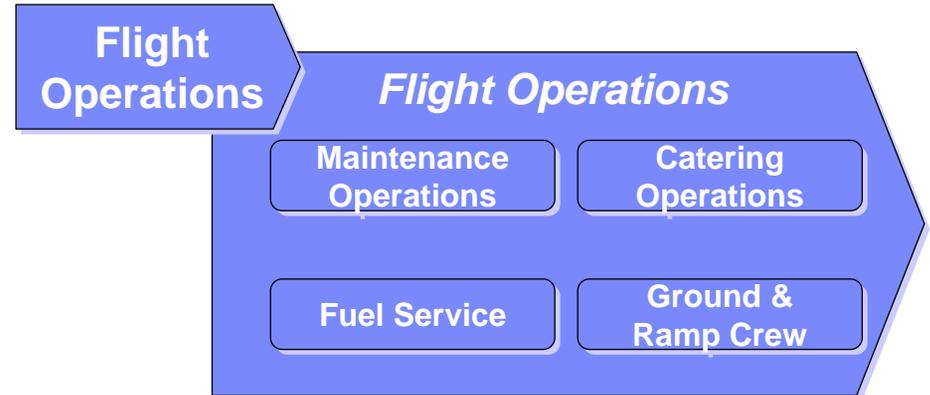


# The demand for innovation, flexibility and desire to create new revenue sources has led to rethinking industry structures

- **Disintermediation** refers to, literally, the process of removing the intermediaries.

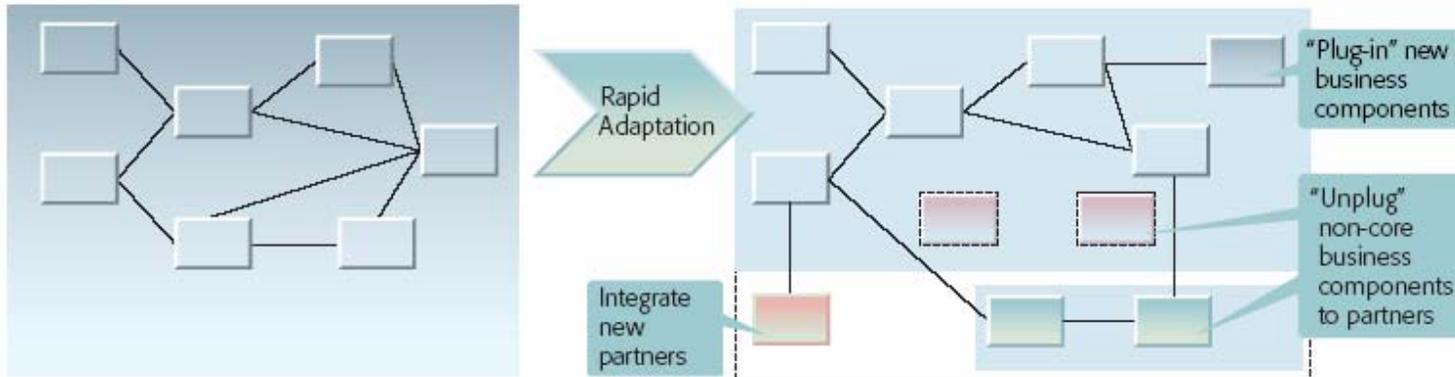


- **Disaggregation** is about ever-greater levels of specialization, as when products or services are further broken down.



.. ❖ *Deconstruction of the core business components find increasingly broad acceptance naturally leading to the emergence of collaborating ecosystems*

**Business componentization** and **service orientation** are important enablers in achieving flexibility required for dramatic innovative changes



Component-based business can adapt to business needs through changes to its component composition

- ➔ The notion of componentization allows an enterprise to deconstruct, analyze, and then reconstruct into value nets
- ➔ The process of deconstruction/reconstruction is realized through business components (i.e. distinct business functions)
- ➔ The component-based enterprise links its components efficiently and seamlessly both internally and across its boundaries

2005 <http://www.research.ibm.com/journal/sj/444/cherbakov.html>

by L. Cherbakov, G. Galambos, R. Harishankar, S. Kalyana, G. Rackham

## Today's discussion

**Business Challenges**

**Business Componentization**

**Service Orientation**

**SOA Journey Best Practices**

**Future: Service-Oriented Enterprise (SOE)**

# Let's start with some base-line definitions so we're all talking in same terms

## ... a service?

A **repeatable business task** – e.g.,  
check customer credit;  
open new account

## ... service orientation?

A way of integrating  
**business as linked services**  
and the outcomes that  
they bring

## ... service oriented architecture (SOA)?

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

## ... a composite application?

A set of **related & integrated** services that  
support a business  
process built on an SOA



# SOA means many things based on your perspective

## “SOA in context ...”

Business

- a set of services that a business wants to expose to their customers and partners, or other portions of the organization

Architecture

- an architectural style which requires a service provider, requestor and a service description
- a set of architectural principles, patterns and criteria which address characteristics such as *modularity, encapsulation, loose coupling, separation of concerns, reuse, composability and single implementation*

Implementation

- a programming model complete with standards, tools and technologies such as Web Services

# Enterprises adopt SOA as a way to address different business challenges

## Increase revenue

create new routes to market,  
create new value from  
existing systems

## Provide a flexible business model

react to market changes  
more quickly

## Integrate across the enterprise

integrate historically separate  
systems, facilitate mergers  
and acquisitions of  
enterprises

## Reduce cycle times and cost for external partners

move from manual to  
automated transactions,  
facilitate flexible dealings  
with business partners

## Drive down cost

eliminate duplicate systems,  
build once and leverage,  
improve time to market

## Reduce risk and exposure

improve visibility into  
business operations

Each represents a  
SOA value  
proposition

## Regulatory Compliance

meet federal, local or industry  
regulations



# Case Study: VISA

## reference implementation for managing disputes

### Increase revenue

create new routes to market,  
create new value from  
existing systems

### Provide a flexible business model

react to market changes  
more quickly

### Integrate across the enterprise

integrate historically separate  
systems, facilitate mergers  
and acquisitions of  
enterprises

Each represents a  
SOA value  
proposition

### Reduce cycle times and cost for external partners

move from manual to  
automated transactions,  
facilitate flexible dealings  
with business partners

### Drive down cost

eliminate duplicate systems,  
build once and leverage,  
improve time to market

### Reduce risk and exposure

improve visibility into  
business operations

Regulatory Compliance  
meet federal, local or industry  
regulations

## Leveraging a services approach, Visa achieves significant operating savings and increased re-use

- ➔ **Quick, integrated access** to transactions and information from multiple disparate systems to automate the resolution of disputes
- ➔ **Reduced the number of issues** that come to dispute because of new inquiry capabilities and **resolution time has been cut by one-third**
- ➔ **Saved issuers \$52 million** in operating costs, while member bank savings from the reduction in volume **exceeded \$300 million** last year
- ➔ Over **US\$400 million** in cost savings for merchants in the United States
- ➔ Represents an **extension of Visa's open systems goal** of ensuring that code can be componentized, encapsulated, compartmentalized, replaced and reused easily;
- ➔ To date, **10% of internal applications** have Web services components



"If you take all the transactions across all the stock markets and exchanges in the world, and you aggregated them over a 24-hour period, we do that volume over a coffee break."

Sara Garrison,  
SVP of Network  
and Open  
Systems  
Development



# Case Study: IRS Modernized e-File (MeF) Project



## Increase revenue

create new routes to market,  
create new value from  
existing systems

## Provide a flexible

## business model

react to market changes  
more quickly

## Integrate across the enterprise

integrate historically separate  
systems, facilitate mergers  
and acquisitions of  
enterprises

## Reduce cycle times and cost for external partners

move from manual to  
automated transactions,  
facilitate flexible dealings  
with business partners

Each represents a  
SOA value  
proposition

## Drive down cost

eliminate duplicate systems,  
build once and leverage,  
improve time to market

## Reduce risk and exposure

improve visibility into  
business operations

## Regulatory Compliance

meet federal, local or industry  
regulations

# Case Study: IRS Modernized e-File (MeF) Project

*MeF received the Pioneer Award at the e-Gov Institute Forum in June 2004 and was recognized as the 'best solution' for innovation and delivery of essential e-Government services to businesses.*

## Challenge

- ⇒ Congress mandate: 80% of taxpayer transactions to be “electronic” by 2007
- ⇒ Large and complex organization that in 2003 processed 222 million returns and 128 million refunds, employed nearly 100,000 worldwide
- ⇒ Complex IT environment
  - Tape-based Master Files (circa 1963)
  - Stove-piped applications map to old organizational structure and reflect tax code provisions
  - Diverse inventory: 16 mainframes, 870 midrange computers, 100,000+ individual computers, 2,775 vendor supplied software products, 50 million lines of IRS-maintained code, over 500 identified individual business applications

## Solution

- ⇒ A robust, scalable SOA-based system that links external trading partners with new e-file applications and legacy submission processing “pipeline” systems
- ⇒ E-file data is made available internally to most IRS employee users

## Benefits

- ⇒ Enabled e-filing for all corporations and exempt organizations
- ⇒ Error rates in accepted submissions requiring manual resolution dropped from 25% to 6%.
- ⇒ Increased IRS employee productivity through increased availability of submission data
- ⇒ Support new e-file business processes that enable a broader range of trading partner business models
- ⇒ Provide replacement path for legacy e-file systems

Source: IRS presentation at the IBM SOA Summit, 2005

## Today's discussion

**Business Challenges**

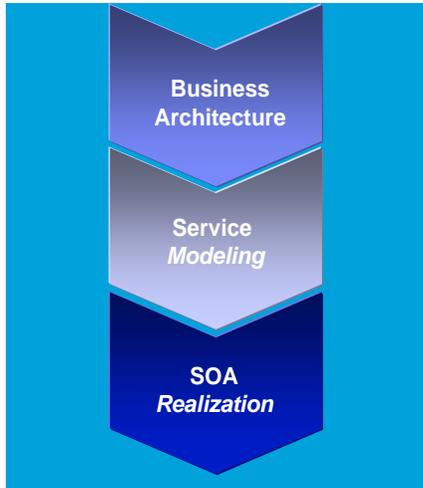
**Business Componentization**

**Service Orientation**

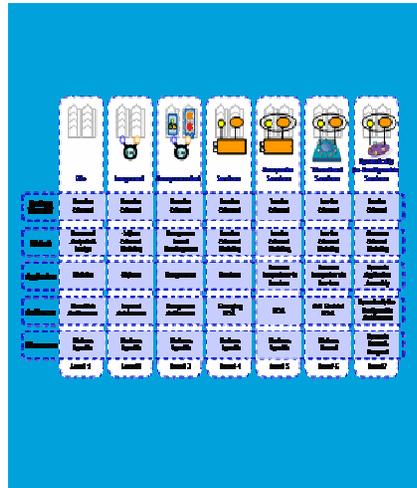
**SOA Journey Best Practices**

**Future: Service-Oriented Enterprise (SOE)**

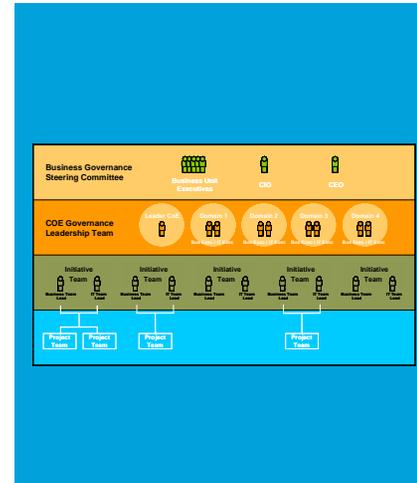
# SOA journey: Best Practices



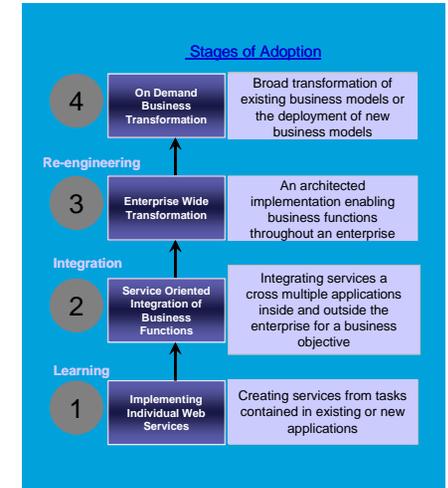
1. Align business architecture and IT



2. Assess and Plan

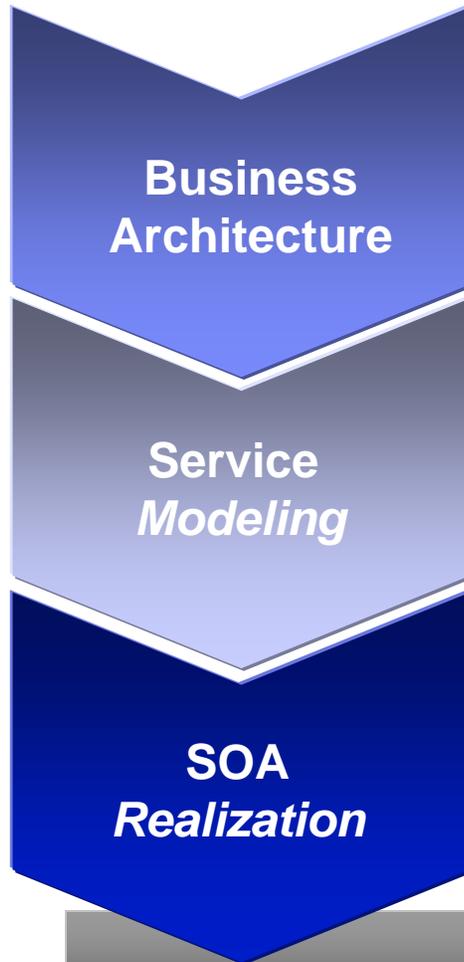


3. Enable plan execution through GOVERNANCE



4. Implement incrementally – avoid BIG BANG

# Best Practice #1: Align business architecture and IT architecture



1. **Break down your business into components**
2. Decide what is strategically important, and what is just operations in the value chain domains
3. Analyze the different KPIs attached to these components
4. Prioritize and scope your transformation projects

1. **Define a Service Model**
2. Identify your services based on your business components
3. Specify the services and components accordingly
4. *Make SOA realization decisions based on architectural decisions*

1. **Implement a Service Model**
2. Develop a service-oriented architecture to support the Componentized Business
3. Implement service based scoping policy for projects
4. Implement appropriate governance mechanism

**Business-Aligned IT Architecture**

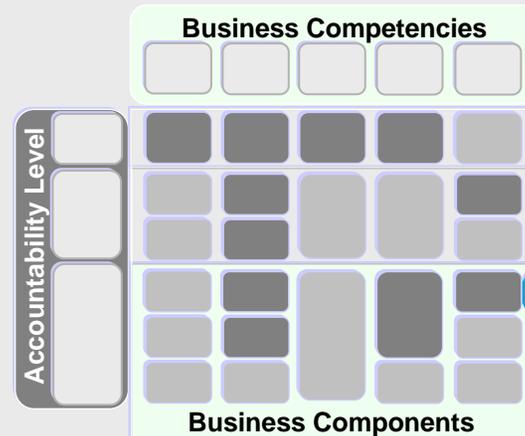
# The new optimized enterprise should be reconstructed as a loosely coupled network of modular business components

## Component Business Models – What is the new structure that firms should embrace?

- The world's most successful firms will be "Specialized Enterprises" focusing on a few critical components
- The Component Business Model allows firms to evaluate their organization and operations to take advantage of internal and external specializations
- Each business component provides and consumes services
- Most enterprises today are followers that passively create value

### "Component Business Model"

An enterprise design that aggregates business activities into cohesive and loosely-coupled components that can be shared across a firm



### "Business Component"

An individual business module that contains similar activities supported by appropriate assets, such as people and technology

#### Dimensions of a Business Component

Why it exists...  
(Business Purpose)

What it does...  
(Activity)

How it does it...  
(Resources, Applications, Infrastructure)

Source: IBM Institute for Business Value

# Component business modeling approach enables business analysis from many viewpoints, for example, identify components that create differentiating advantage

Suggest focus areas for maximizing return on investment

■ Differentiation

	Business Administration	Product Management	Customer Acquisition	Customer Portfolio Management	Customer Service and Sales	Product Operations	Customer Accounting	Financial Management
Direct	Business Planning	Sector Marketing Plans	Acquisition Planning	Customer Portfolio and Analysis	Customer Sales Planning	Product Operations Management	Customer Accounting Policies	Risk Management
	Business Architecture	Managing Products	Acquisition Oversight	Credit and Risk Management	Customer Servicing Planning			
Control	BU Administration	Product Development and Deployment	Customer Target Lists	Application Processing	Service/Sales Administration	Operations Administration	Reconciliations	Financial Control
	Manage Alliances			Customer Behavior Decisioning				Asset Securitization
	HR Management							
Execute	Legal	Marketing	Campaign Execution	Customer Profile	Sales	Product Processing	Billings	Treasury
	Audit	Market Research		Contact/Event History	Servicing	Rewards Program Management	Payments	Financial Consolidation
	Facilities			Correspondence	Credit Check		Customer Acct	
	Dev & Op Systems	Product Directory				Product Inventory Management	Merchant Operations	Collections and Recovery
	Accounting & G/L							

# Identify non-differentiating or commodity components

Identify focus areas for minimizing essential spend

■ Differentiation    ■ Non-differentiation

	Business Administration	Product Management	Customer Acquisition	Customer Portfolio Management	Customer Service and Sales	Product Operations	Customer Accounting	Financial Management
Direct	Business Planning	Sector Marketing Plans	Acquisition Planning	Customer Portfolio and Analysis	Customer Sales Planning	Product Operations Management	Customer Accounting Policies	Risk Management
	Business Architecture	Managing Products	Acquisition Oversight	Credit and Risk Management	Customer Servicing Planning			
Control	BU Administration	Product Development and Deployment	Customer Target Lists	Application Processing	Service/Sales Administration	Operations Administration	Reconciliations	Financial Control
	Manage Alliances			Customer Behavior Decisioning				Asset Securitization
	HR Management							
Execute	Legal	Marketing	Campaign Execution	Customer Profile	Sales	Product Processing	Billings	Treasury
	Audit	Market Research		Contact/Event History	Servicing	Rewards Program Management	Payments	Financial Consolidation
	Facilities			Correspondence	Credit Check		Customer Acct	Collections and Recovery
	Dev & Op Systems	Product Directory			Cross Selling	Product Inventory Management	Merchant Operations	
	Accounting & G/L							

# Assess the economic contribution of discrete parts of the business

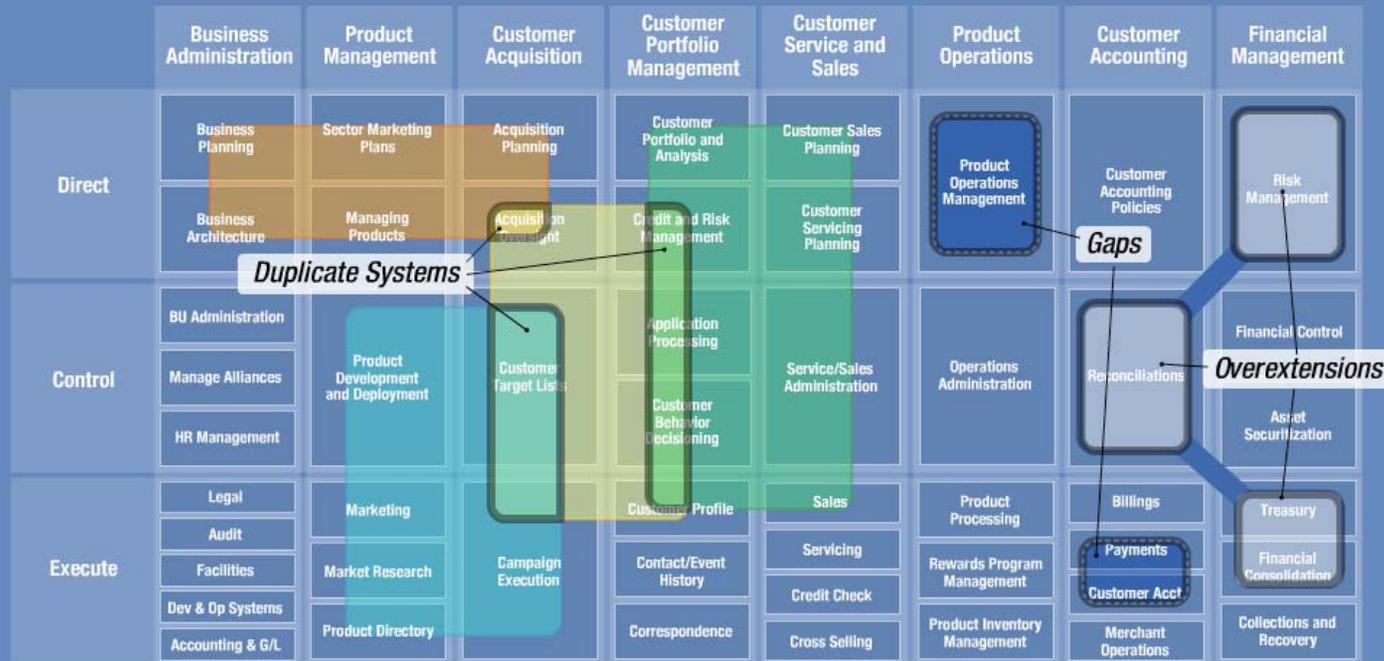
Provide a clearer understanding of economics of running the business

		Business Administration	Product Management	Customer Acquisition	Customer Portfolio Management	Customer Service and Sales	Product Operations	Customer Accounting	Financial Management
Direct	Business Planning	Sector Marketing Plans	Acquisition Planning	Customer Portfolio and Analysis	Customer Sales Planning	Product Operations Management	Customer Accounting Policies	Risk Management	
	Business Architecture	Managing Products	Acquisition Oversight	Credit and Risk Management	Customer Servicing Planning				
Control	BU Administration	Product Development and Deployment	Customer Target Lists	Application Processing	Service/Sales Administration	Operations Administration	Reconciliations	Financial Control	
	Manage Alliances			Customer Behavior Decisioning				Asset Securitization	
	HR Management								
Execute	Legal	Marketing	Campaign Execution	Customer Profile	Sales	Product Processing	Billings	Treasury	
	Audit	Market Research		Contact/Event History	Servicing	Rewards Program Management	Payments	Financial Consolidation	
	Facilities			Correspondence	Credit Check		Customer Acct	Collections and Recovery	
	Dev & Op Systems	Product Directory				Product Inventory Management	Merchant Operations		
	Accounting & G/L					Cross Selling			

■ High Capital   
 ■ High Cost   
 ■ High Cost & Capital

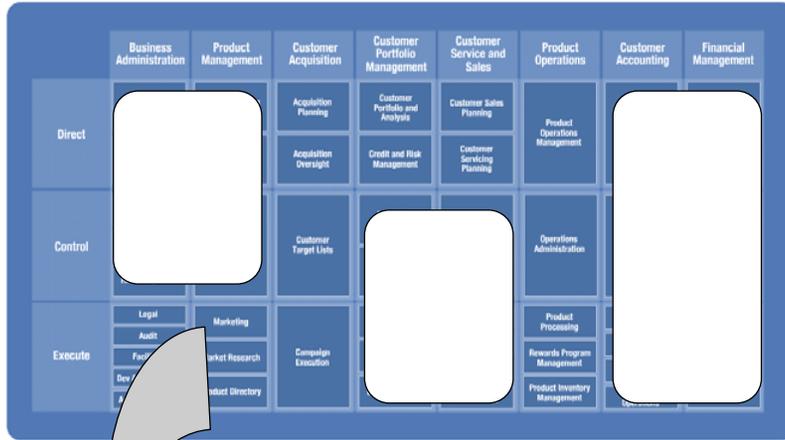
# Derive the appropriate systems and organizational support requirements

Understand where there are gaps, overextensions and duplications in your systems and organization

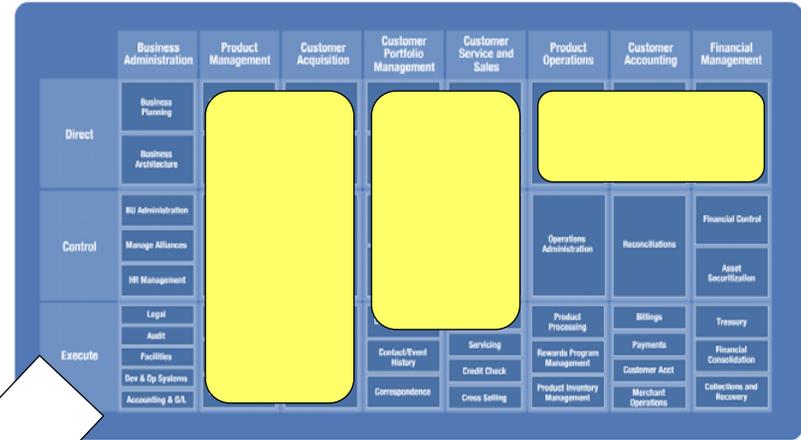


# Case Study: global telecom enterprise used Component Business Modeling to frame the issues during the merger

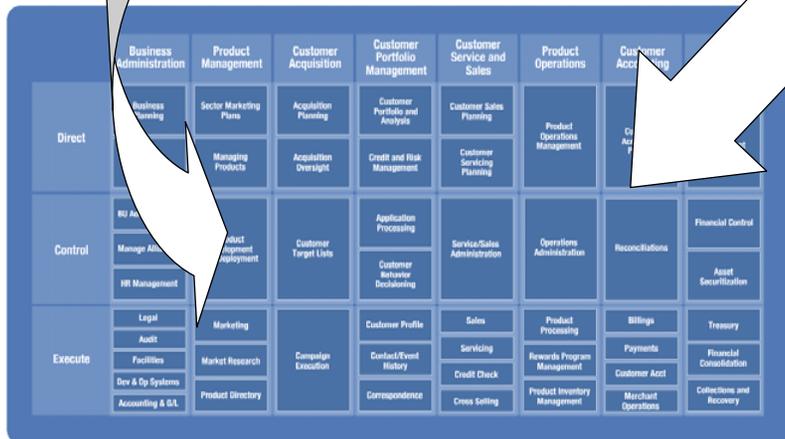
Company #1



Company #2



Merged Company



1. Merging companies can design their new business model around the capabilities to best enable their strategy and then take the best from both companies
2. Where there are duplications, existing capabilities can be analyzed in a non-siloed way based on rigorous capabilities analysis, future requirements and items such as regulatory requirements like Sarbanes-Oxley

# Case Study: Travelex started with componentization to standardize, automate and integrate business processes and infrastructure

## Establish a flexible SOA foundation to address opportunities

- Reduce complexity and increase flexibility by organizing IT as a service
- Connect key applications to transact and exchange data more effectively
- Enhance development effectiveness for faster speed to market
- Leverage existing infrastructure to enable cost-effective growth

## Why Transform

- To standardize, automate and integrate processes and infrastructure

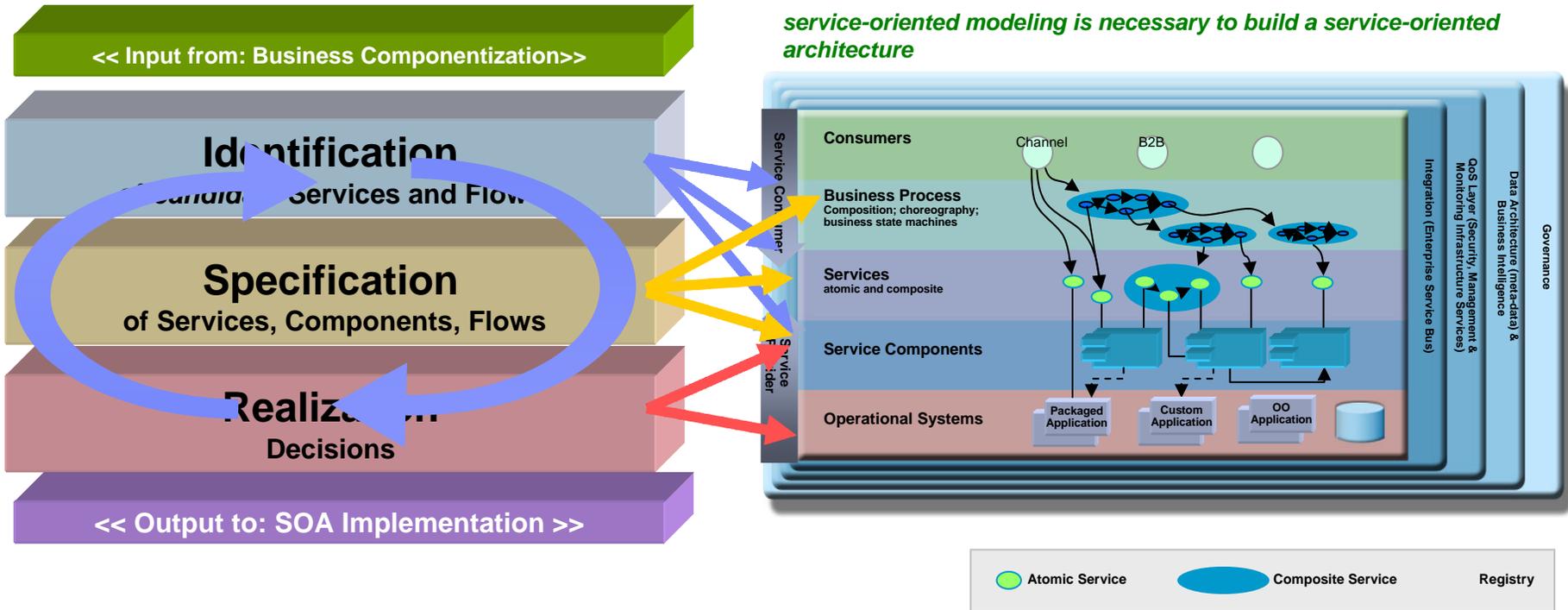
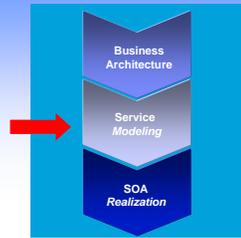
## The Solution

- Standardize: Open platform for the development of applications speeding time to market
- Automate: Connected key applications to transact and exchange data more effectively
- Integrate: Organized IT as a services via an open environment

## The Results

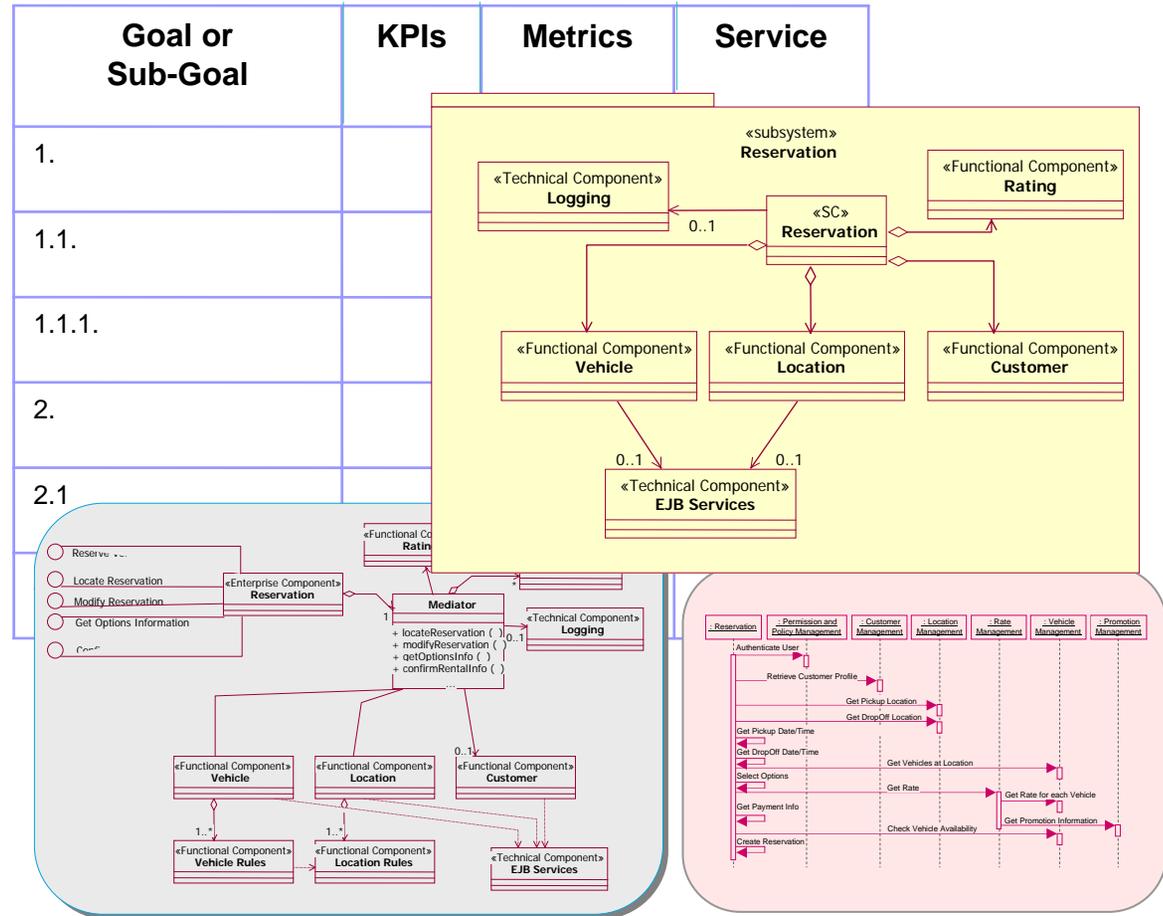
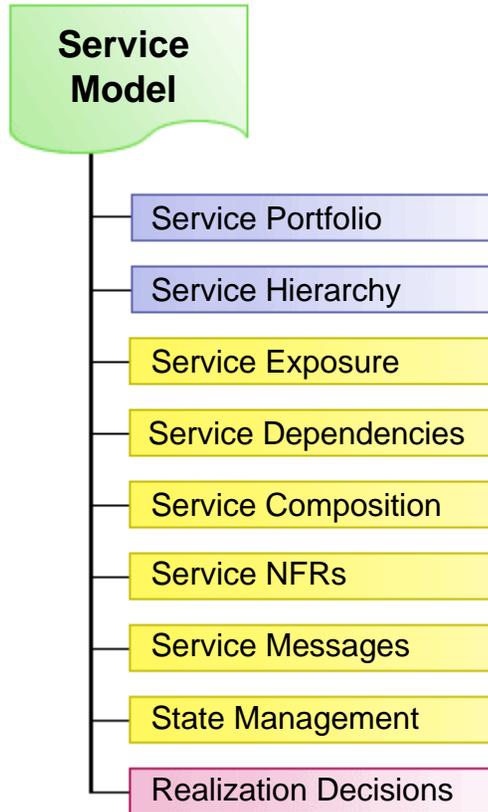
- Transactions -85%
- Development time -30%
- Administrative & support costs -20%
- Easy partner integration
- Robust, flexible platform

Next, align business and IT goals through services modeling that connects an enterprise's business model with its technology model



Source: IBM Service-Oriented Modeling and Architecture (SOMA) method

# At the heart of the SOA is the Service Model that defines services and components that realize them



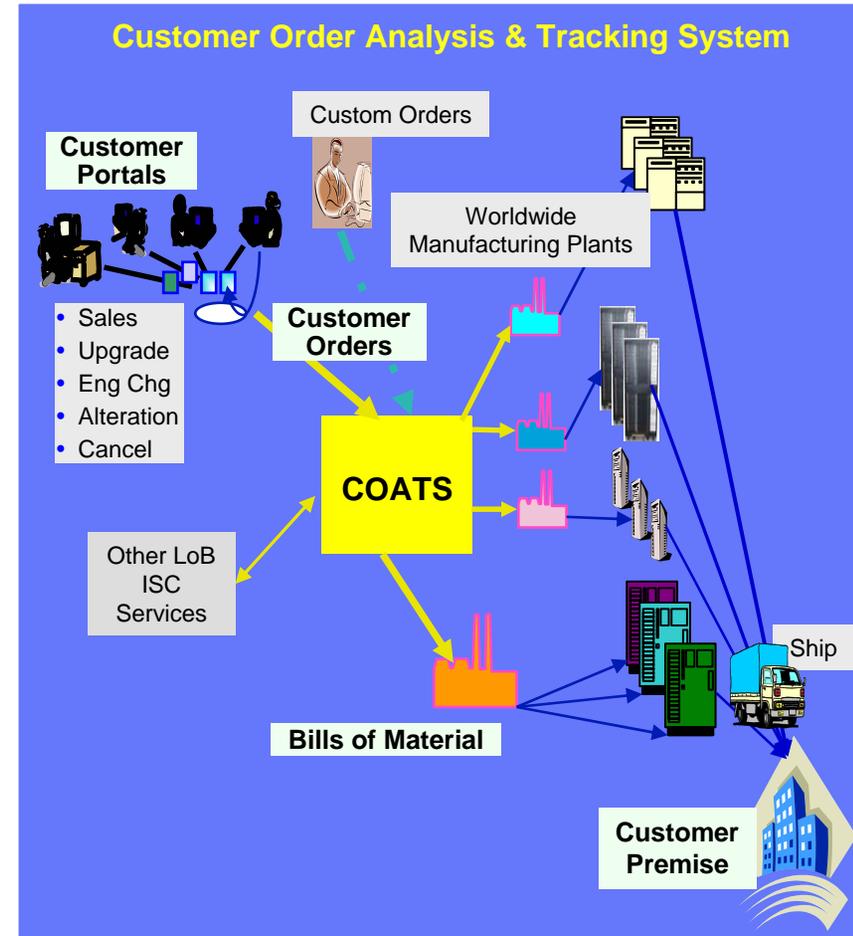
# Case Study: Transformation of IBM Customer Order Analysis Tracking System (COATS)

## Business challenges

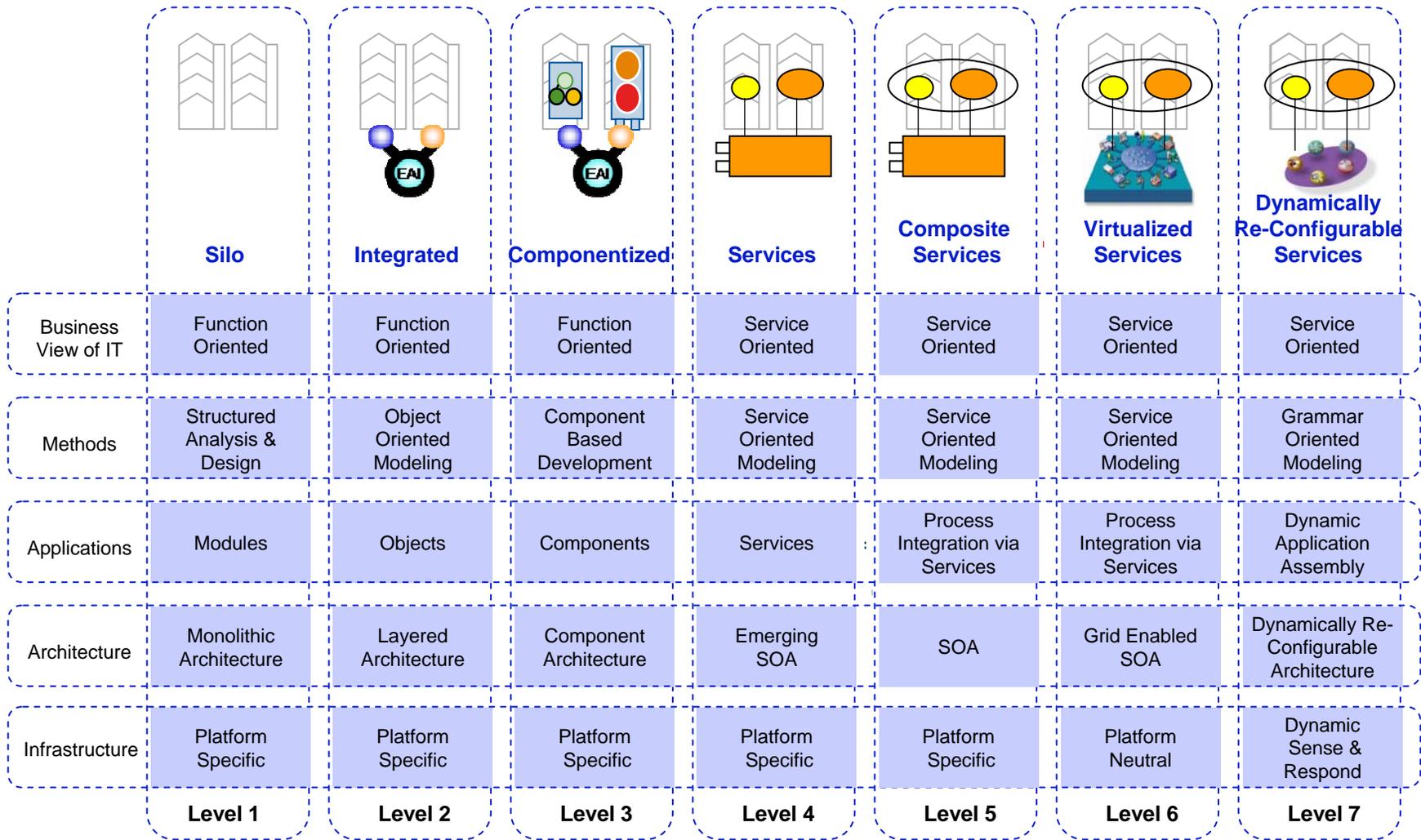
- Complex shared order entry system for 20 hardware manufacturing facilities around the globe
- Rigid legacy code difficult to modify, slowing ability to address new business opportunities and requirements
- PL/I programmers difficult to find
- Batch bottlenecks and conflicting data delayed orders and shipments
- “Big bang” total replacement unaffordable and disruptive

## Transformation outcome (ongoing since 2004)

- COATS gradual transformation into a flexible SOA-enabled environment that supports **real-time transactions and increased resiliency**
- **Incremental migration** from legacy => **affordability**
- Legacy business logic converted to workflows of **reusable services** enabled by service components
- Improved development productivity - **25+% reduction in development time / cost**
- Improved runtime efficiency



# Best Practice #2: Assess and Plan



Source: IBM SIMM

# SOA Maturity: Where are you? Where do you want to go? How to get there?

The screenshot displays the IBM SOA Readiness Assessment interface. The top window shows a question: "3.4 Which statement best describes your organization's ability to create new applications from existing services?". Below the question are four radio button options:

- Currently we are not able to create new applications from existing services.
- We are beginning to create composite applications from existing services having the desired interface.
- We often create new solutions using existing services and at the business level.
- We often create new solutions using existing services and at the enterprise level.

The bottom window shows the "Maturity" section with a "Capabilities Gap Analysis" diamond and a "Maturity Level Analysis" section. The diamond has four vertices labeled "Architecture", "Application", "Process", and "Infrastructure". The "Maturity Level Analysis" section includes a "Capabilities Gap Analysis" table and a "Maturity Level Analysis" section with a "Connect" to "Automate" to "Optimize" funnel diagram.

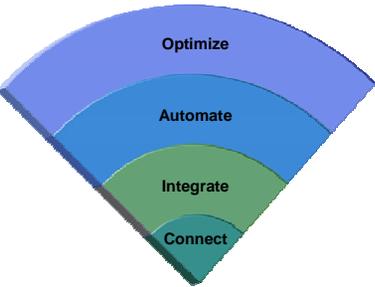
Overlaid on the right is a large funnel diagram with a green dot at the top labeled "How Do I Get Here?" and a green box at the bottom labeled "You Are Here". The funnel is divided into three segments: "Connect" (bottom, green), "Automate" (middle, blue), and "Optimize" (top, purple). Several orange dots are placed along the funnel's path, with lines pointing to the "You Are Here" box.

*Actionable recommendations customized to your level of SOA maturity*

Source: IBM SOA Assessment at [ibm.com/soa](http://ibm.com/soa)



# Case Study: Kookmin Bank integrates two contact centers after a merger



Set Direction

Execute Roadmap

Realize Business Value

## Business challenges:

- Separate set of business processes supported by separate infrastructure
- No comprehensive customer view across multiple accounts => led to extended call wait times ultimately threatening customer satisfaction

## Business Value:

- Decreases customer call wait times by **20 percent** and enables cross-selling and up-selling
- Reduced the frequency of calls to branch offices by **70 percent**
- Significantly **decreased operating costs** by allowing customer on-line self-serve
- **100% payback less than one year** after full implementation
- Leverage contact center assets in other channels

*“Not only have we improved information sharing among our employees, we have also unlocked the information about our customers contained in our backend systems. This allows us to improve our customer response time while lowering costs.”* -- Youngho Lee, Managing Director, Kookmin Contact Center

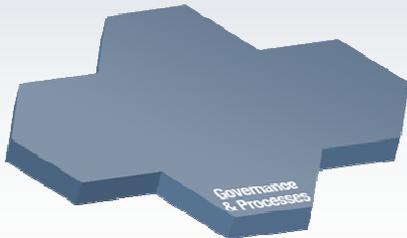
*Solution:*  
SOA enabled by IBM WebSphere Application Server, MQ, eServer, WebSphere Studio Application Developer tools, KANA eCRM, Genesys VoIP

## Best Practice #3: effective SOA Governance

**“Effective IT Governance is the single most important predictor of value an organization generates from IT.”**

*MIT Sloan School of Mgmt.*

- **Increasing Share Price** Professional investors are willing to pay premiums of *18-26% for stock in firms with high governance*
- **Increasing Profits** “Top performing enterprises succeed where others fail by implementing effective IT governance to support their strategies. For example, firms with above-average IT governance following a specific strategy (for example, customer intimacy) had more than *20 percent higher profits* than firms with poor governance following the same strategy.”
- **Increasing Market Value** “On average, when moving from poorest to best on corporate governance, firms could expect an *increase of 10 to 12 percent in market value.*”



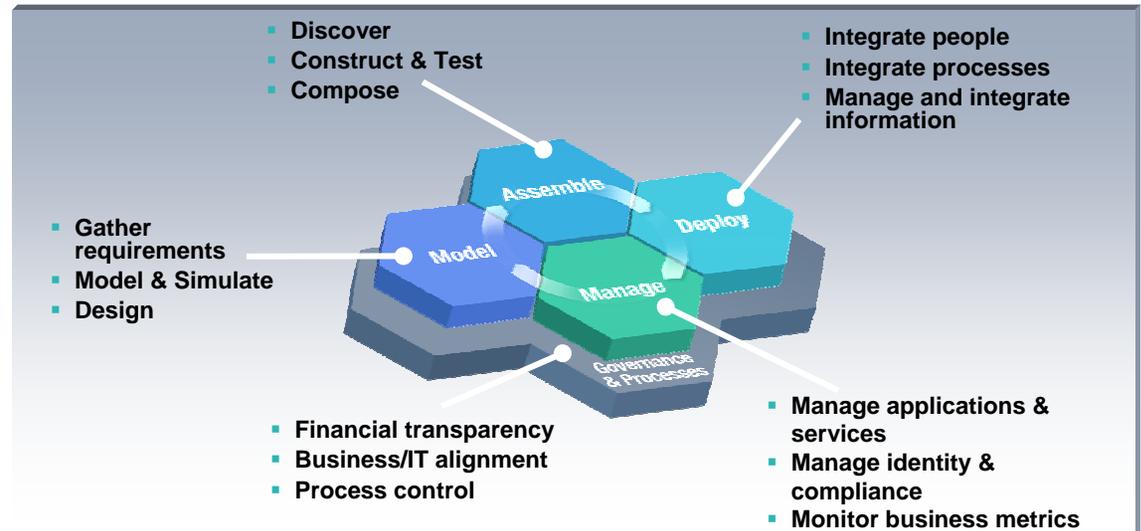
*Source: MIT Sloan School of Mgmt.*

# What do you really mean by SOA Governance?

## The governance model defines:

- ⇒ What has to be done?
- ⇒ How is it done?
- ⇒ Who has the authority to do it?
- ⇒ How is it measured?

## Focus on the service life-cycle



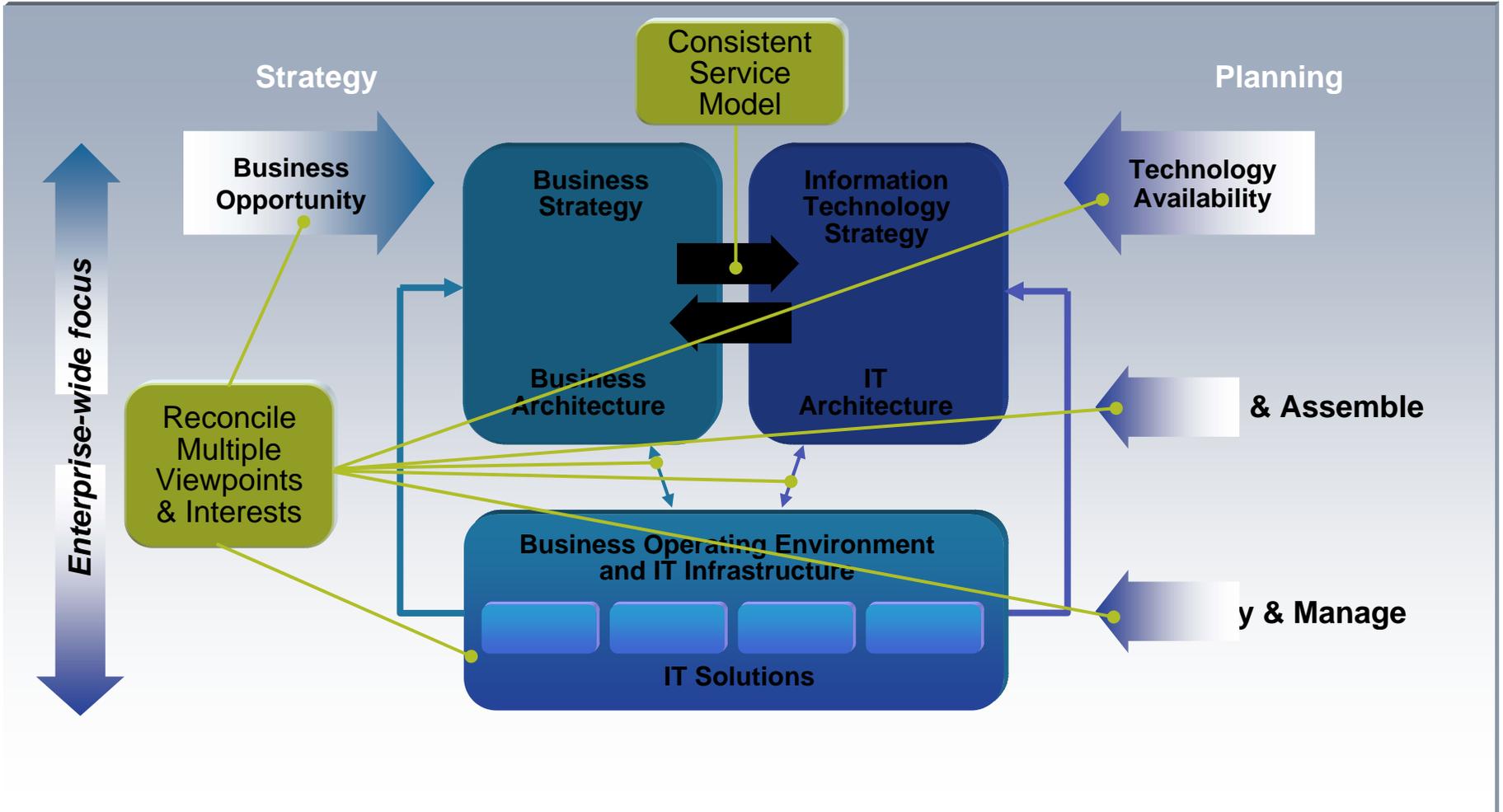
- What has to be done: service model **Lifecycle**
- How is it done: **decision** path based processes
- Who has the authority to do it: the roles of the **SOA CoE** and the associated roles
- How is it measured: the vitality and conformance **checkpoints**
  - **Conformance** check points deal with design direction decisions and funding.
  - **Vitality** check points help ensure the SOA architecture stays current.

## Governance is not management:

- Governance determines who has the **authority** to make a decisions. Management is the process of making and implementing the decisions.

# SOA Governance in context

*IT and Operations align with Business*

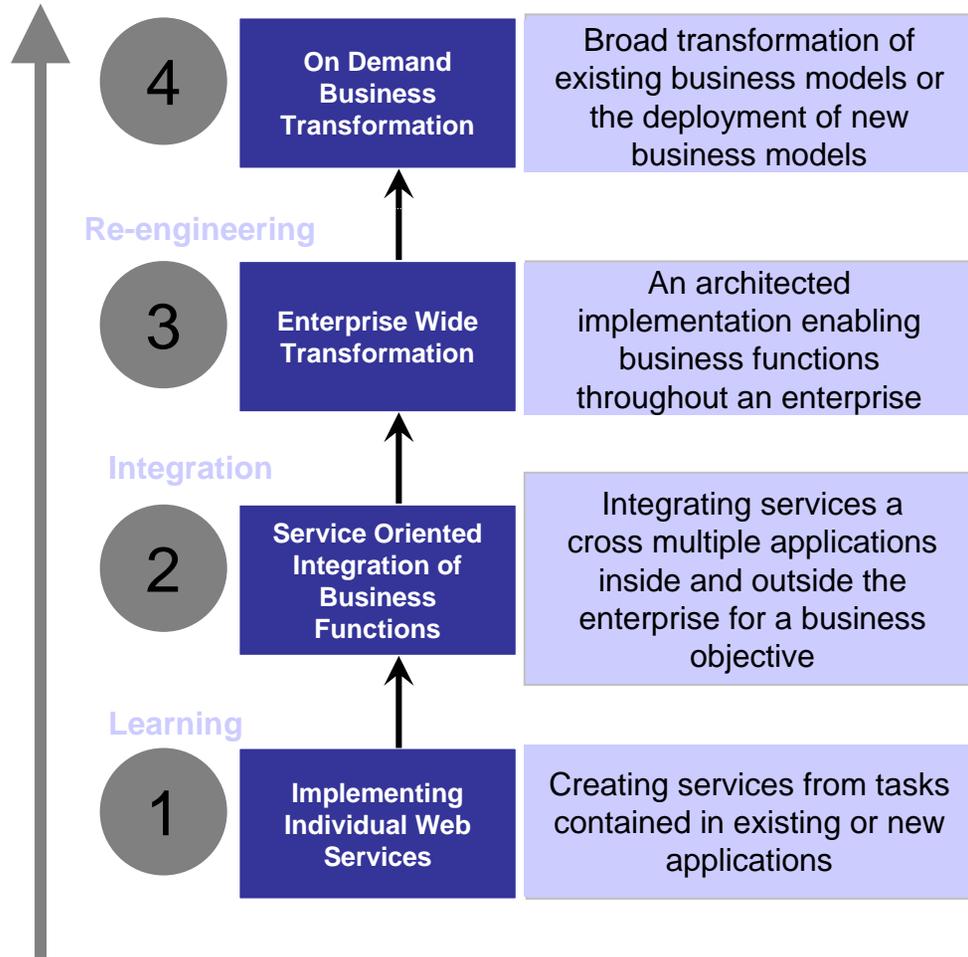


## Case Study: Fireman's Fund established SOA Center of Excellence to accelerate SOA adoption



# Best Practice #3: Best Implement incrementally – avoid BIG BANG

## Stages of Adoption



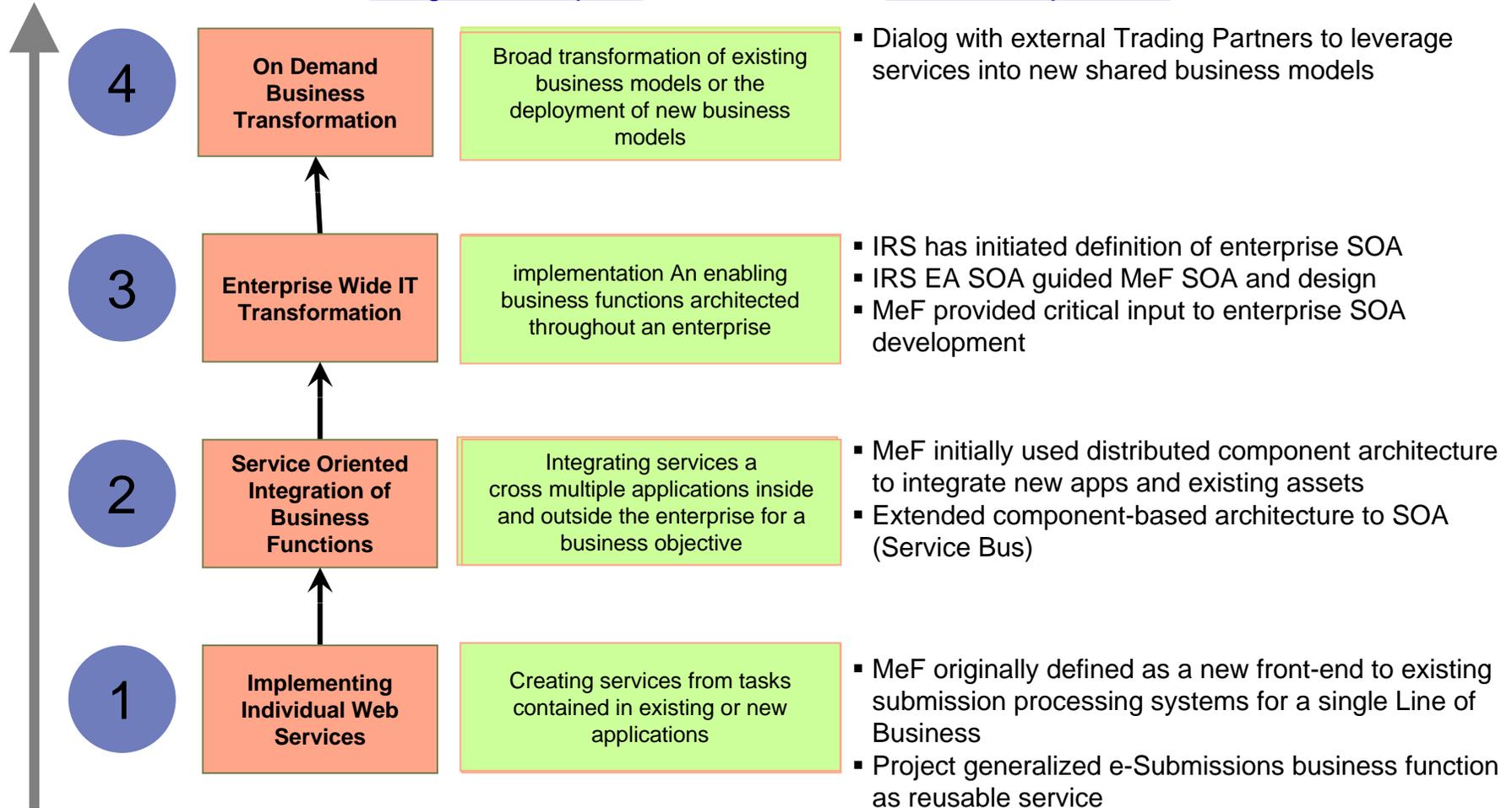
## SOA and Web Services Role

- Enables standards-based connection of entire value network
  - Services, products, partners, and process flows may vary with market conditions and services available
  - SOA becomes the framework in IT transformation
- 
- Enables a publishing and consumption of services --through self-description and dynamic combination –
  - Enabled within a Service Oriented Architecture
- 
- Integrates partners, divisions or channels with WS for basic transactions
  - Integrates a private network of partners or divisions
  - SOA used in larger ecosystem of consumers and providers
- 
- Exposing existing functionality as web services, unlocking value from current infrastructure

# MeF project has evolved in its adoption of SOA along with IRS Enterprise Architecture

## Stages of Adoption

## MeF/IRS experience



Source: IRS presentation at the IBM SOA Summit, 2005

## Today's discussion

**Business Challenges**

**Business Componentization**

**Service Orientation**

**SOA Journey Best Practices**

**Future: Service-Oriented Enterprise (SOE)**

# Evolving the business ecosystem

	Traditional Enterprise	Service-Oriented Enterprise
<b>Business ecosystem</b>		
<b>IT role in business (business/IT alignment)</b>	IT has supporting role (“enabler” of business activity). Business organization has the challenge to ensure that IT understands and supports business requirements.	IT plays a strategic role in business transformation, including creation of new sources of business revenue. IT systems mirror the attributes of the business they enable.
<b>Business value creation</b>	Value is created in each phase in the value chain (e.g., from raw goods to finished products). Business value is created mostly within the enterprise.	Real-time information moves across the value net among cooperating businesses, facilitating dynamic relationships among partners. The business value is created through services provided by participants.
<b>Business requirements/fulfilment coupling</b>	Business requirements often generated and fulfilled by the same business unit/enterprise	Logical separation of business need (service consumption) from fulfilment (service provision). The same business need can be fulfilled by multiple providers.

- ➔ The elevation of IT’s importance
  - Business process optimization is tightly linked to IT solutions
  - IT, in some cases, drives business strategy or even comprises the business model foundation (e.g. Amazon, eBay Inc, Google, etc.)
  - Strategic role business transformation
- ➔ Value nets
  - information is moving in real time across the cooperating businesses
  - the relationships among the partners is dynamic and varies with changing conditions
  - the operating targets of the business include not just efficiency but also agility
- ➔ Logical separation of the business function from its implementation

## Emergence of new roles and organizational structures

	Traditional Enterprise	Service-Oriented Enterprise
<b>Organizational Issues</b>		
Organizational structure	Hierarchical	Horizontal, network-like structure based on service consumer-service provider relationship
Intermediaries	Limited applicability	Service intermediaries are needed to accelerate negotiations and facilitate switching providers
Common interpretation of service definitions	Limited applicability	Shared definitions of industry services

- ➔ Change in organizational structure and roles
  - loosely coupled organizations that are based on the role definitions of service consumers and service providers and the understanding of their relationships
  - the relationships within each unit may remain hierarchical, the relationships between units are not; they are based on the provision and consumption of services
  - funding models need to shift from being based on lines of business to being based on the enterprise or, perhaps, on consumption
  - GOVERNANCE
- ➔ Emergence of service intermediaries
- ➔ Common interpretation of service definitions
  - both static definitions and runtime characteristics
  - common industry semantics of service definitions apply within each business domain (e.g., insurance, sales, and fulfillment) as well as across domains.

## Intermediaries will act as liaisons between providers, consumers, or even other intermediaries

Registrar	Provides registration (publication) of services, inquiries, and reports of commercially available services
Broker	Finds the best (registered) service based on consumer-provided criteria
Reseller	Provides proxy service for a service provider
Biller	Provides invoicing/collecting service between consumers, providers, and other intermediaries
Authenticator	Ensures identification of service consumers
Host	Provides physical hosting of the commercially available service (external to service provider)
Service Aggregator	Aggregates commercially available specialized services

# Transforming business process

	Traditional Enterprise	Service-Oriented Enterprise
<b>Business Process</b>		
Process flow and composite services	Process flow is often sequential; value creation is cumulative and based on the value chain. Composition of services is limited	Process flow is net-like, through composition and enhancement (and often parallel execution) of existing services provided by participants in the business ecosystem.
Process design	Static, sequential flow with decision points in predefined sequence. Modeling is focused on decomposition.	Dynamic, based on execution results of sub-processes. Near real time dynamic orchestration.

- ➔ Role of composite services
  - the service-oriented enterprise has the option of assembling its processes by using services provided by others
  - business processes can be created by using a composition of existing services in a new enhanced service
  - services are combined according to certain business logic to deliver specific functionality and quality of service
  - each service has an associated declarative policy that specifies quality of service, availability, and other attributes necessary to meet the overall business process goal
  
- ➔ Ascent of dynamic processes
  - the choice of subsequent process steps may be based on the full or even partial results of previous steps rather than on a predefined static sequence
  - the creation of a new service is not just a combination of several existing services - it may involve modification or enhancement of existing services, and these may include steps involving human intervention
  - requires new approaches to process modeling - new models need to be able to support more than just process decomposition. New concepts, modeling constructs, and tools must be able to capture processes with flexible sequences that are result-based rather than sequential with fixed decision points

## The end game

- Vision: Service-Oriented enterprise that is equipped to cope with the challenges of the new business environment, including revenue growth, ***flexibility and innovation***



# Questions

