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How SOA Can Help EA

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Presentation Outline

- ❑ The current trend
- ❑ Enterprise Architecture, SOA, and their relationships
- ❑ Apply SOA to Enterprise Architecture – Service Oriented Enterprise Architecture
 - Service Oriented Enterprise
 - Service Oriented Applications and Systems
 - Service Oriented Infrastructure

Current Trend

- Internet Era

- Businesses are more agile, geographical limitations are diminishing
- Increasing needs in collaboration and information sharing to enable the "link"
- Old systems with stove-piped design need to be modernized

- Information Revolution

- Comparing to Industry Revolution age, we are in an Information Revolution age now
- Business relies more on information
- Need more organized and efficient ways for information processing and utilization

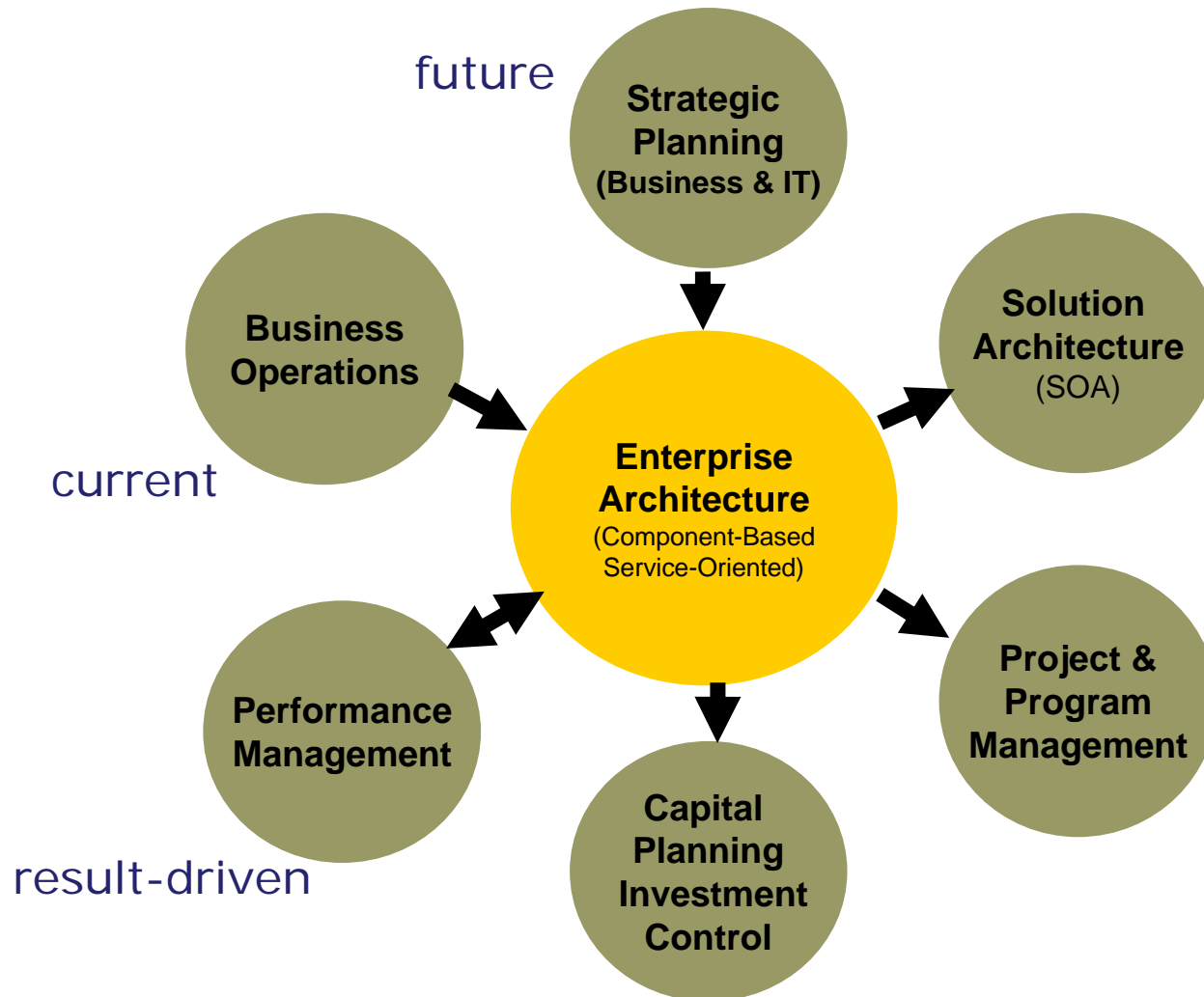
- SOA is the current state of art, is leading a new paradigm shift

- Promotes collaboration, service and info sharing, IT flexibility, and business agility

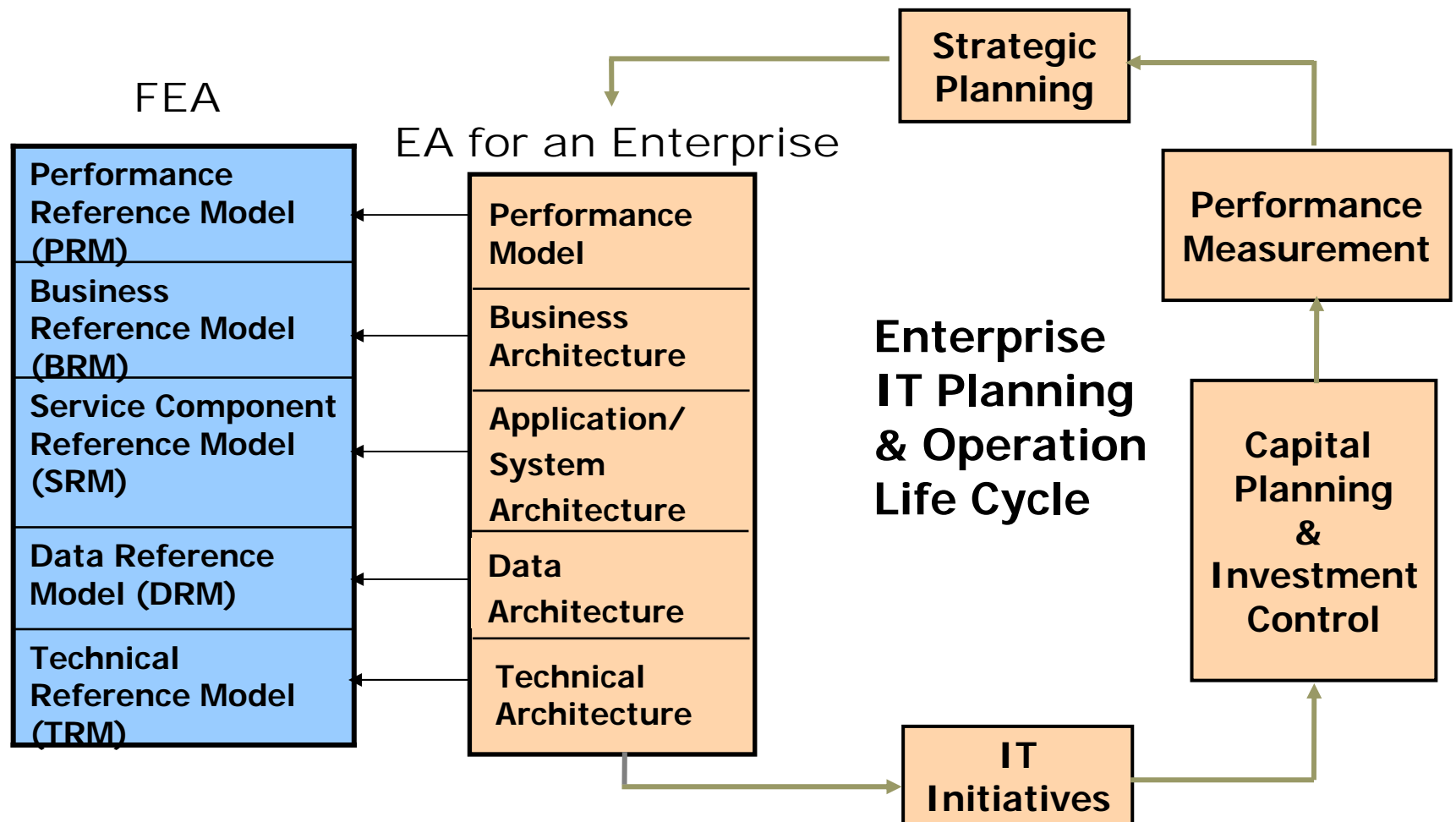
The Purpose of Enterprise Architecture

- Have a blueprint and long-term guidance
- Facilitate decision making
- Support enterprise modernization efforts
- Enhance collaboration and interoperation
- Streamline business processes and technology implementations across the enterprise
- Enable resource sharing and cost efficiency by identify common and sharable components and services
- EA for an enterprise .vs. city plan for a city

Enterprise Architecture in Context



Enterprise Architecture Components and Enterprise Life Cycle



What is SOA

SOA is an architectural style and modeling approach that

- Emphasizes well-defined, loosely coupled, reusable and shareable services
 - Coarse-grained, business-centric services
 - Layered technology services
 - Componentized
- SOA, as a practical modeling approach, it suits enterprise architecture (EA) development very well
- It helps in bridging EA with solution architecture and implementation by layered service components across business models, application models, and technology implementation

Relationships: EA, SOA & Web Service

- **Enterprise Architecture:** It's a *subject domain* that is independent of approaches and methodologies for its development and presentation.
- **Service-Oriented Architecture:** It's a *architecture style* that describe businesses and systems with service-orientation.
- **Web Services:** It's a *technology* that enables us to implement applications in a service-oriented way.

Service Oriented Architecture Adoption in an Enterprise

● Service Oriented Enterprise

- How SOA affects enterprise
- Apply SOA to architectures and planning
- Apply SOA to enterprise service portfolio management
- Apply SOA to lifecycle, governance, and ROI

● Service Oriented Applications/Systems

- Apply SOA to application and system services
- Apply SOA to data services
- Apply SOA to federated Service Infrastructure

● Service Oriented Infrastructure

- Apply SOA to IT infrastructure -> SOI
- Service Oriented Infrastructure Framework
- Integrate SOI framework with ITIL

*This indicates how SOA can be applied to EA

Service Oriented Enterprise Architecture

- **Service Oriented Enterprise**
 - How SOA affects enterprise
 - Apply SOA to architectures and planning
 - Apply SOA to enterprise service portfolio management
 - Apply SOA to lifecycle, governance, ROI
- **Service Oriented Applications/Systems**
- **Service Oriented Infrastructure**

How SOA Affect Enterprise

- **SOA introduces a paradigm shift to enterprise**
 - Manage business functions into loosely coupled services to reduce complexities and lessen the impact of changes
- **SOA introduces changes to traditional organization culture and management mechanisms**
 - Break stove pipes to enable collaboration
 - Achieve long-term benefits instead of short-term ones
- **SOA can optimize enterprise operational cost**
 - Shared services
 - Enable separate business functions from IT infrastructure and technology improvement (via layered architecture)
- **SOA can enhance enterprise lifecycle and governance by introducing service life cycle and governance**
 - Enable better scope for measurement and control

Apply SOA to Architecture and Planning

- The Challenges in Enterprise Architecture Practice
- How SOA can mitigate EA challenges
- Modeling EA in a service-oriented manner – Service Oriented EA (SOEA)
- Simplify SOEA modeling via horizontal and vertical partition –> domain segmentation and service federation

EA Practice Challenge: Stakeholder participation

Enterprise Architecture

- **Lack of Stakeholder Participation, due to**
 - ◆ Traditional culture
 - ◆ Background of people
 - ◆ Organization structure
 - ◆ Competing priorities
 - ◆ Value proposition
- **Lack of clear guidance for collaboration in**
 - ◆ Target picture
 - ◆ Work direction
 - ◆ Roles and responsibilities
 - ◆ Effective approach and methods

SOA

- **Increase Stakeholder participation**
 - ◆ Easier communication through service-oriented concept
 - ◆ Break organization boundaries via common services
 - ◆ Reduce cost via shareable and reusable services
- **Paint a Clear Picture for Collaboration by**
 - ◆ Common service infrastructure
 - ◆ Common functional services
 - ◆ Clarification of roles and responsibilities regarding to services
 - ◆ Self-sufficient service components with manageable scope in organizational level

EA Practice Challenge: Architecture Modeling

Enterprise Architecture

- **How to Model big picture**
 - ◆ Depth and breadth of architecture scope
 - ◆ Model matches audience
 - ◆ Not to jump into details too quickly and lost big picture
- **Produce meaningful models and conceptual abstraction**
 - ◆ EA .vs. engineering process
 - ◆ EA approaches and methodologies .vs. framework
 - ◆ EA uniqueness for each enterprise
 - ◆ Insight and vision
 - ◆ Skilled architect for conceptual models

SOA

- **SOA can simplify big picture description**
 - ◆ Atomic service components
 - ◆ Loosely coupled, not hard-wired
 - ◆ Depth and breadth are covered by flexible layered services
- **SOA makes EA envisioning, planning, and modeling easier via**
 - ◆ Componentized and layered services
 - ◆ Loosely coupling
 - ◆ Iterative development
 - ◆ Matching different skills to different Services in different layers

EA Practice Challenge: Architecture Usage

Enterprise Architecture

- **Lack of EA product acceptance due to lack of**
 - ◆ Stakeholder participation
 - ◆ Value proposition
 - ◆ The relevance of EA to specific projects
 - ◆ Gap analysis
- **Need flexible EA framework that can**
 - ◆ Connect the EA products and components together
 - ◆ Incorporate changes along the way
 - ◆ Be flexible

SOA

- **SOA increase EA products acceptance by**
 - ◆ Better facilitate stakeholders' participation
 - ◆ Enable better ROI estimate across full spectrum of SOA benefits in a composite way
 - ◆ Help to fill the gaps between EA products and individual project by layered services
- **SOA enables a flexible framework by**
 - ◆ Componentized services
 - ◆ Components loosely coupling
 - ◆ Dynamic service plug-in and update

EA Practice Challenge: Architecture Maintenance and Management

Enterprise Architecture

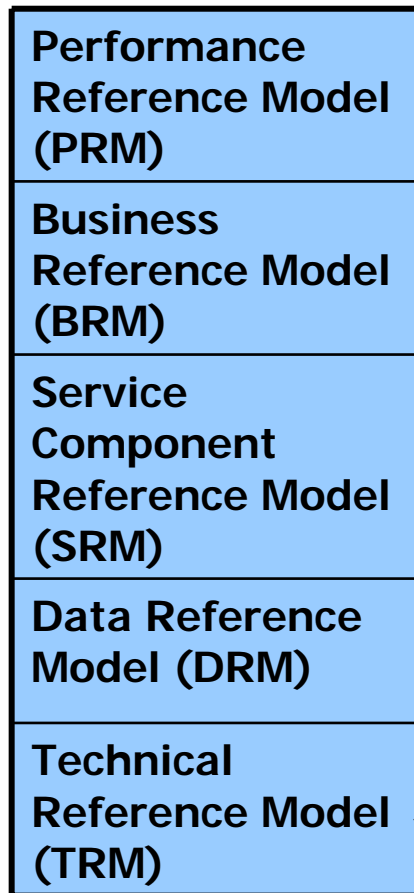
- **Challenge in EA lifecycle management and governance**
 - ◆ Uniqueness and value for each organization
 - ◆ Time and resource constraints
 - ◆ Effective tools
- **Challenge in Resources**
 - ◆ EA needs very special skill set
 - ◆ The bias from either technical or business perspectives
 - ◆ Need artistic ability with vision and insight to present reality via representational models
 - ◆ Lack of EA curricula in Universities

SOA

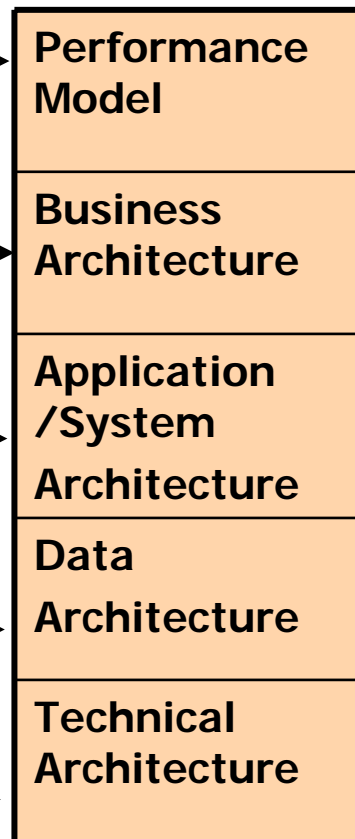
- **SOA based lifecycle management and service governance are easier by**
 - ◆ Incorporating architecture maintenance into service lifecycle
 - ◆ Tools are developed rapidly for service lifecycle management and governance
- **SOA can ease the EA resource pain by**
 - ◆ Matching skills to manageable service scopes and layers
 - ◆ Ease the increasing demands for breadth in architecture competencies

Service Oriented Enterprise Architecture Model

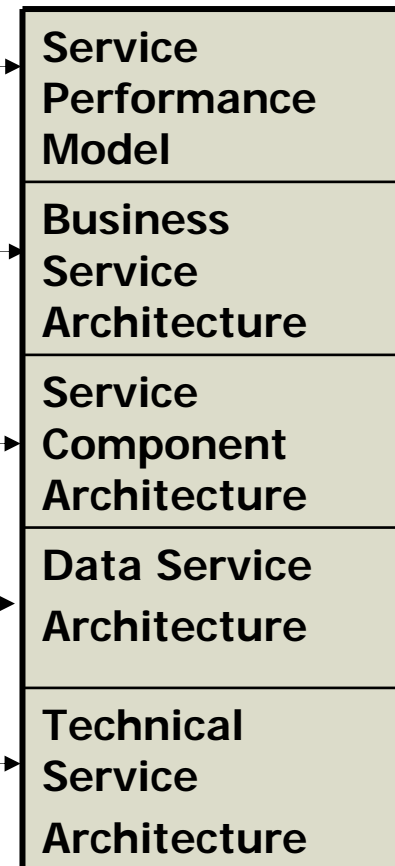
Reference Architecture (FEA)



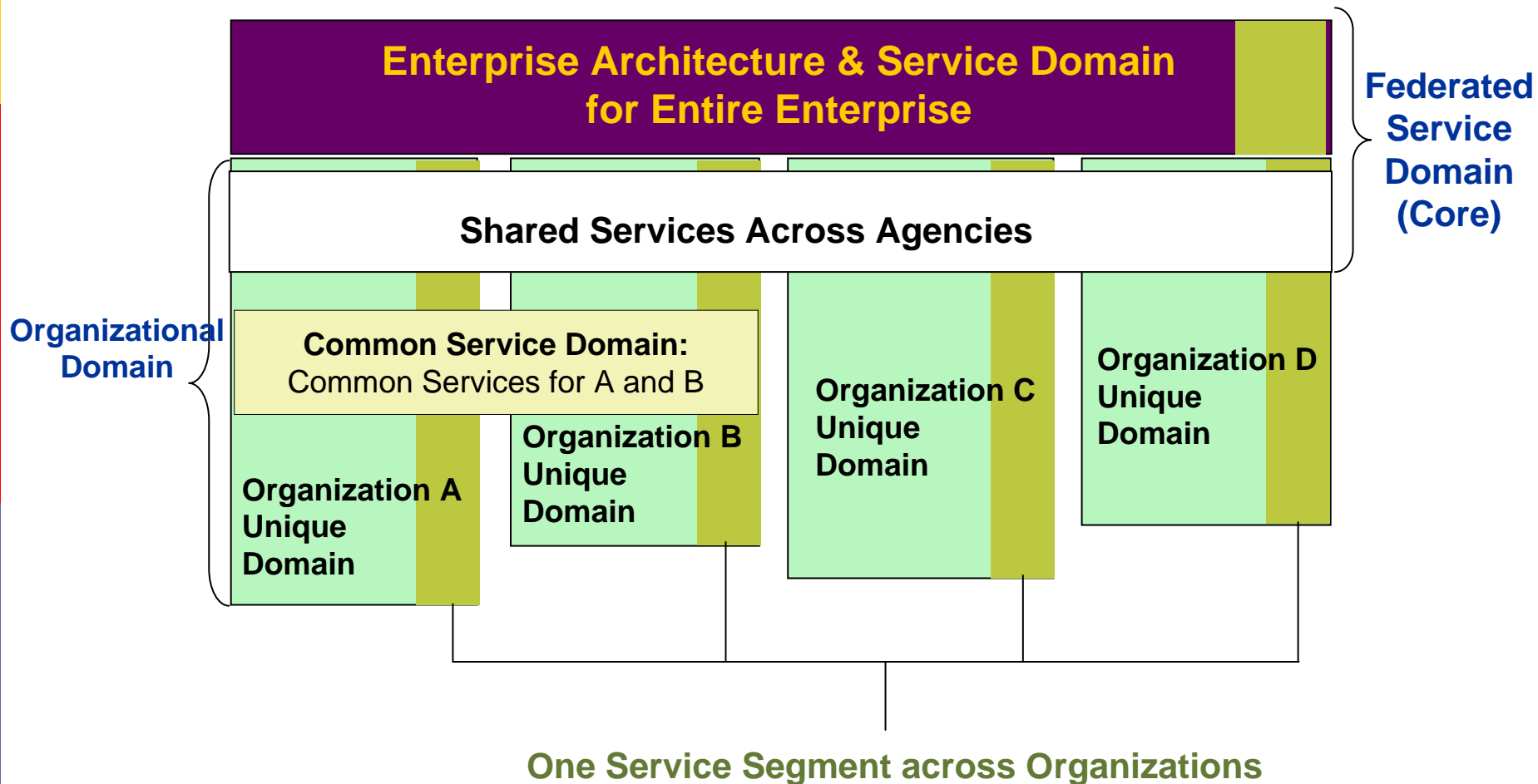
EA for an Enterprise



Service Oriented EA



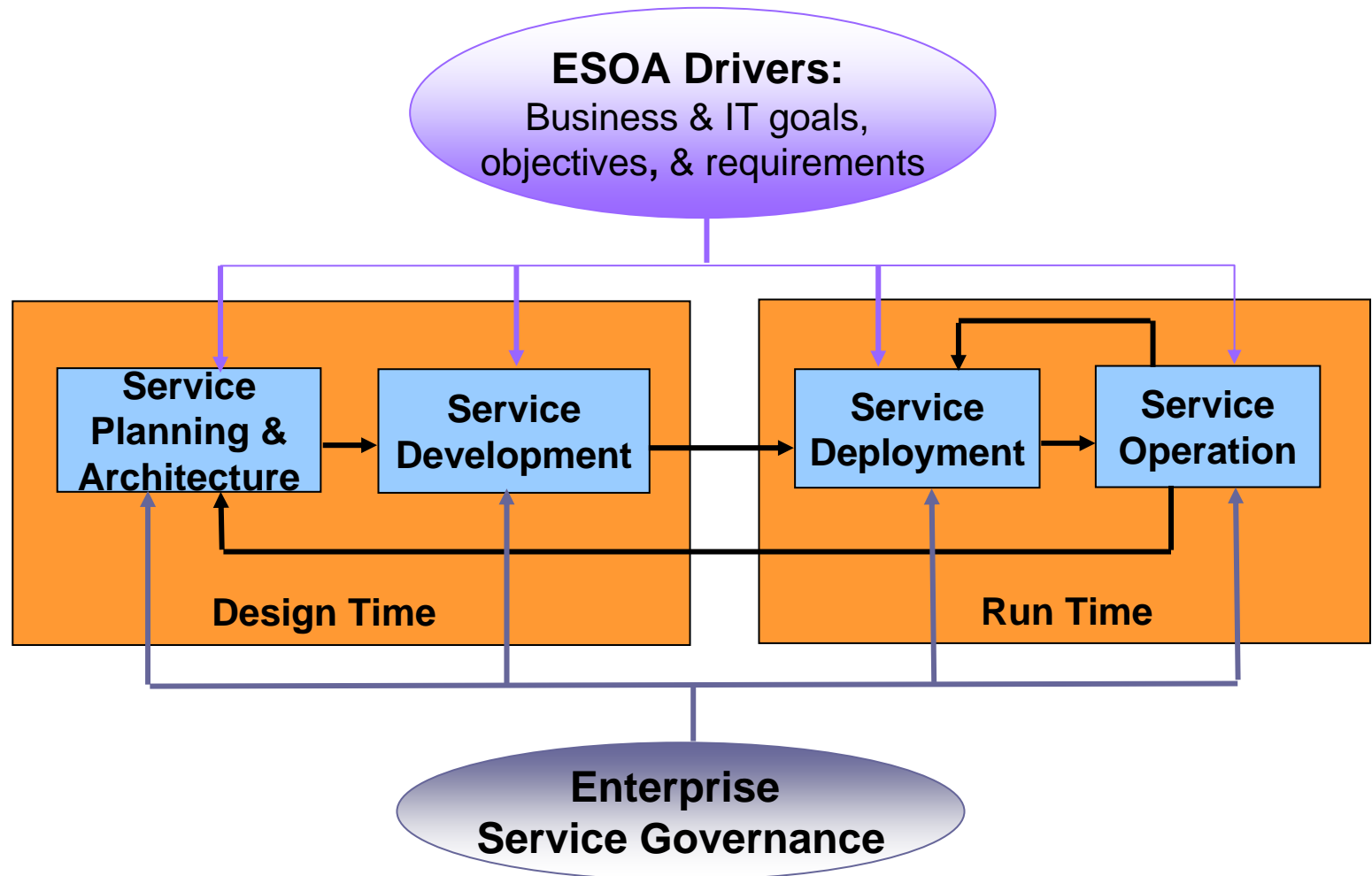
Service Segmentation and Federation



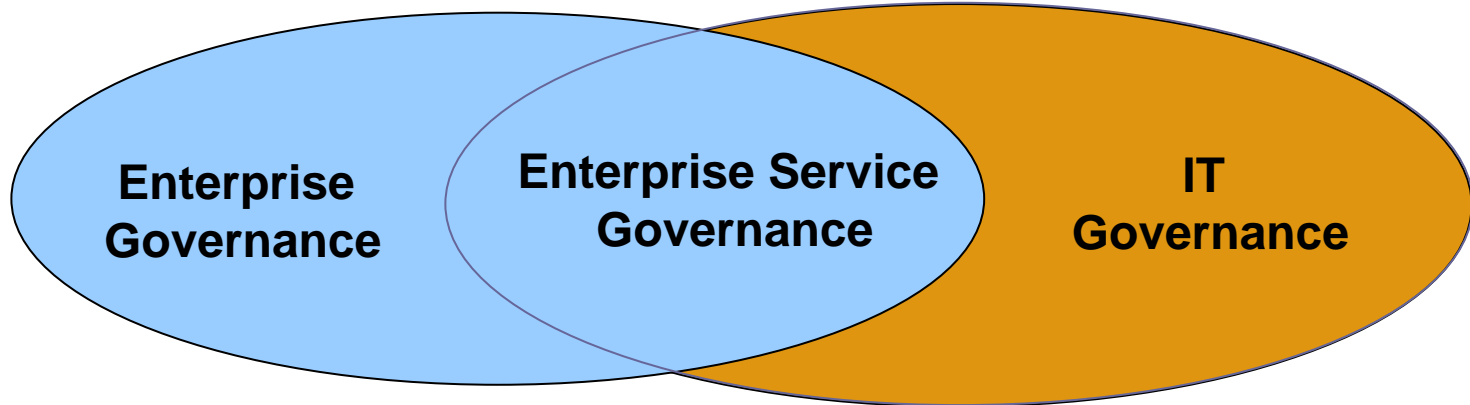
Enterprise Service Portfolio Management

- Enterprise service portfolio management should be built into strategy and governance
- The enterprise service portfolio should take input from enterprise architecture
- Evolve application portfolio management to service portfolio management with services being categorized and being described in layers
- Manage service portfolio lifecycle: planned services, current services, obsolete services

Enterprise Service Lifecycle Management



Enterprise Service Governance



Enterprise Governance

- Governance structure, roles, and responsibility
- Governance policies
- Governance processes
- Governance measurements

IT Governance

- IT governance structure, roles, and responsibility
- IT governance policies
- IT governance processes
- IT governance measurements

Enterprise Service Governance

Cross enterprise and IT regarding to service planning & architecture, development, deployment and operation

Establish ROI

Understand the full spectrum of SOA Benefits

- ROI for business agility
- ROI for asset reuse
- ROI for Common Infrastructure
- ROI from reduced development and integration cost
- ROI from maintenance cost
- ROI from risk mitigation

Assess ROI iteratively and compositely

- Objectives for each service
- Cost for each service implementation
- Direct and indirect returns from the service
- Additional ROI obtained from reuse

inputs

Reference Matrix for ROI

inputs

guidance

guidance

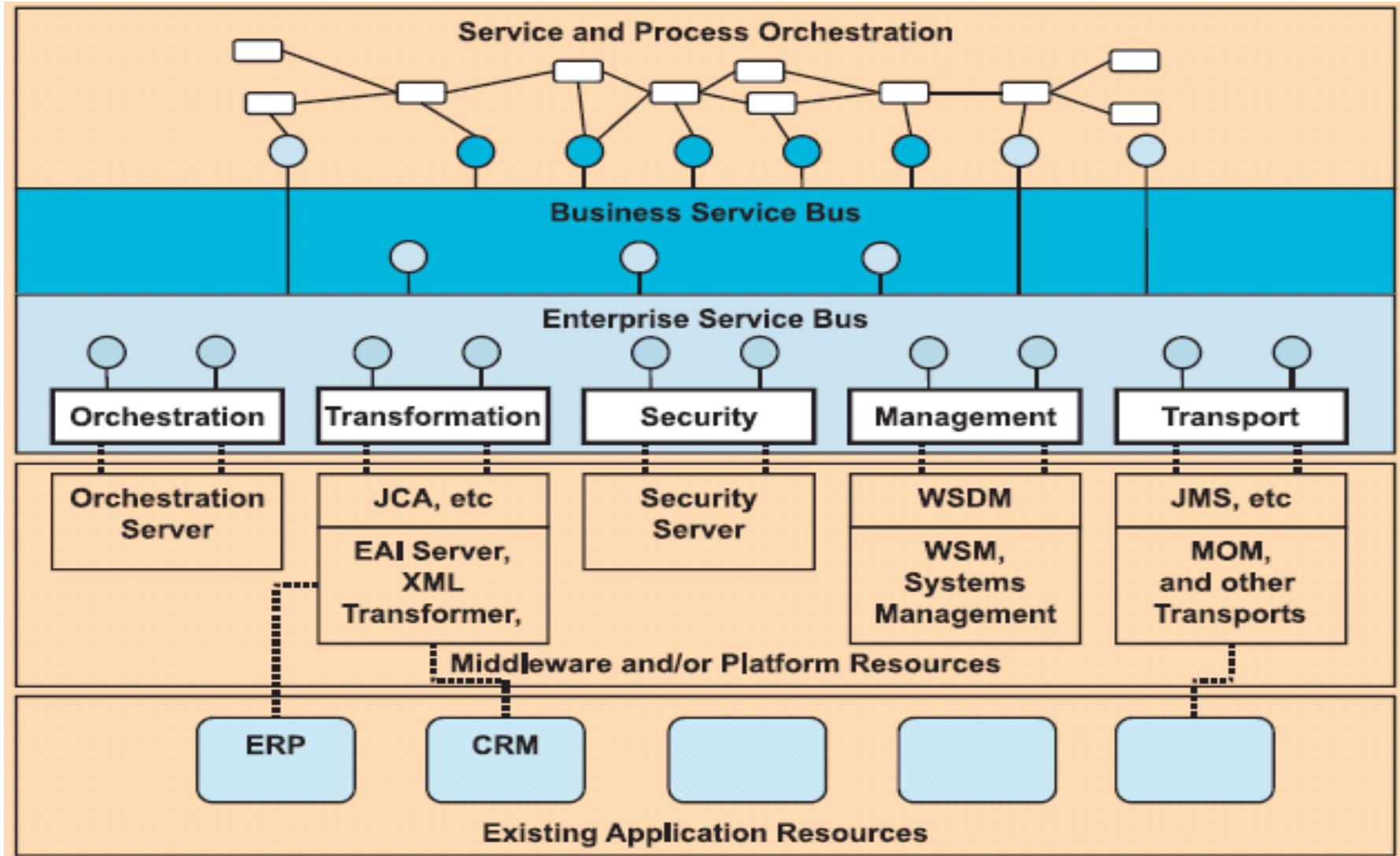
IT Strategic Planning

Performance Measurement

Service Oriented Enterprise Architecture

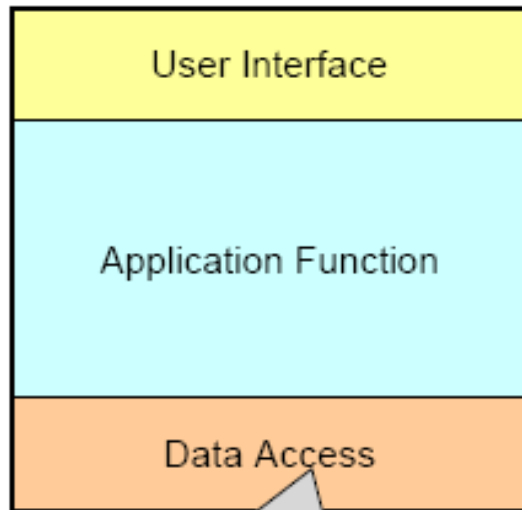
- **Service Oriented Enterprise**
- **Service Oriented Applications/Systems**
 - Apply SOA to application and system services
 - Apply SOA to data services
 - Federated Service Infrastructure
- **Service Oriented Infrastructure**

Service Oriented Application Architecture



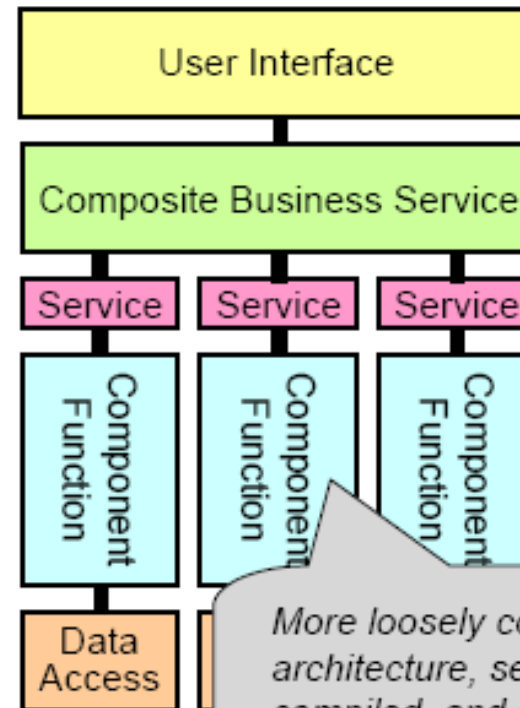
Composite Application

Traditional Application



More tightly coupled architecture and compiled and deployed into a single monolithic runtime

Composite Application

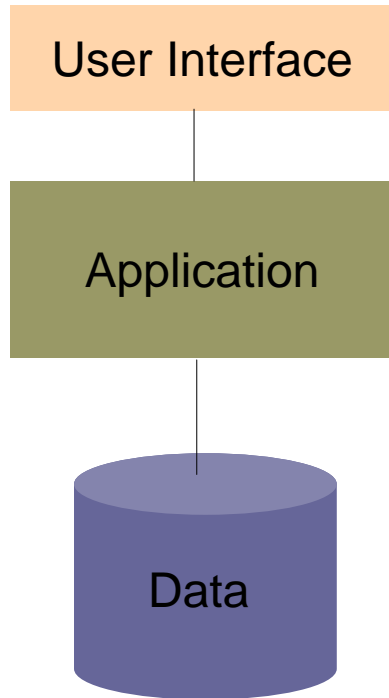


More loosely coupled architecture, separately compiled, and dynamically combined at runtime

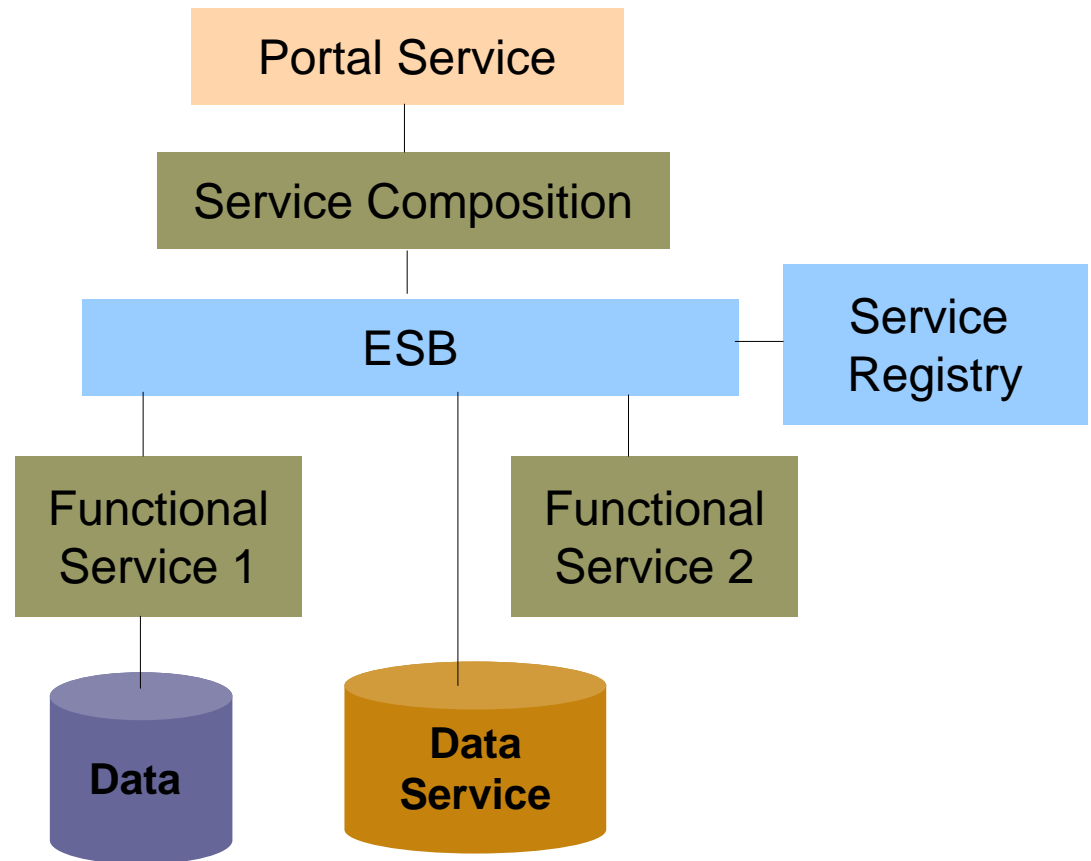
Source: IBM

Service Oriented Data Architecture: Data as a Service

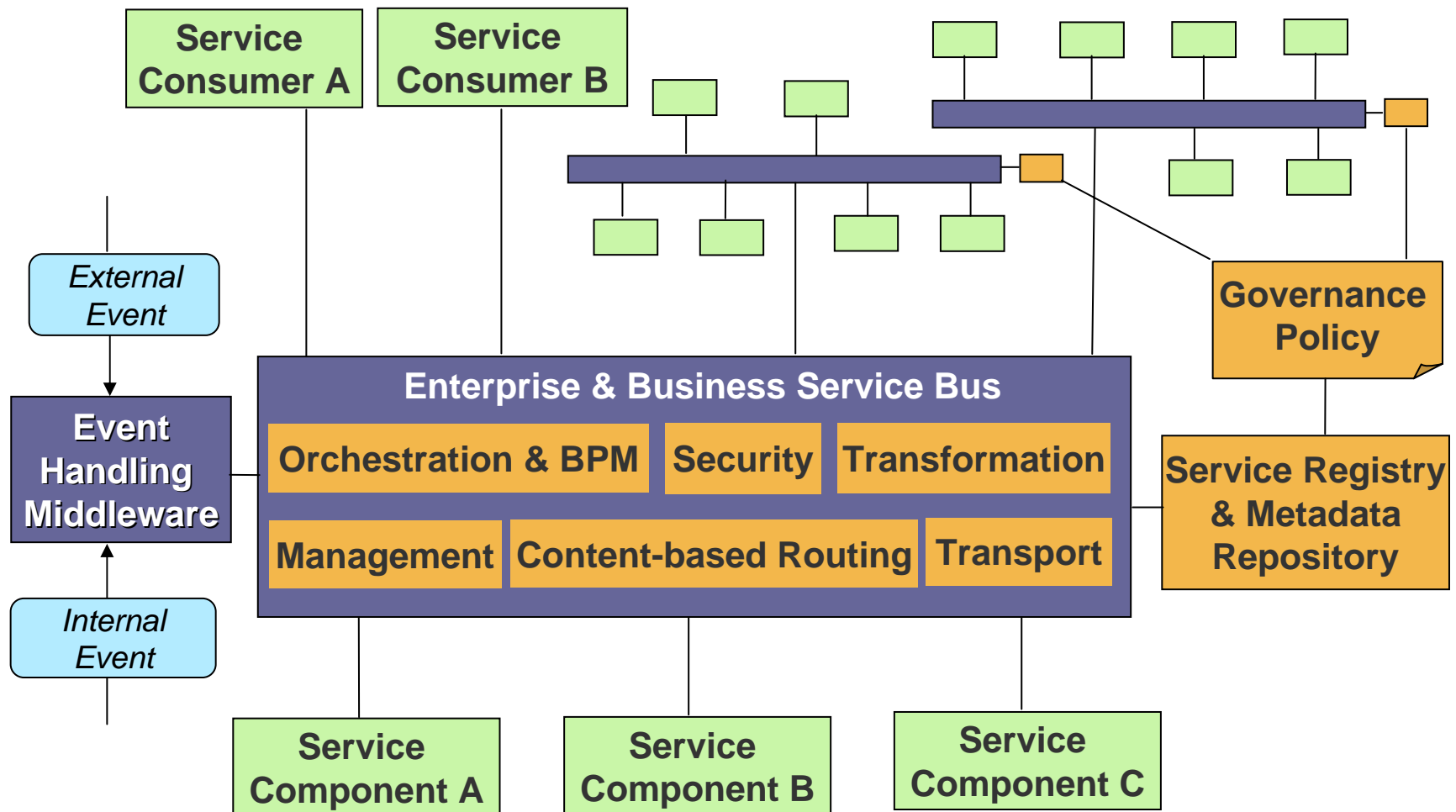
Three-tier architecture:



SOA with data service:



Federated Service Infrastructure



Service Oriented Enterprise Architecture

- **Service Oriented Enterprise**
- **Service Oriented Applications/Systems**
- **Service Oriented Infrastructure**
 - The changing roles of IT and IT infrastructure
 - Apply SOA to IT infrastructure -> SOI
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The Changing Role of IT and IT Infrastructure

● IT in Business

■ Past

- ◆ Operation support
- ◆ Individual project based decision
- ◆ Ad hoc and technology driven implementation

■ Current

- Involved into business strategies and decisions (the agility of business depends heavily on the flexibility of IT for automation)
- Have long-term blueprint and big pictures as guidance (strategic plan and EA)

● IT Infrastructure

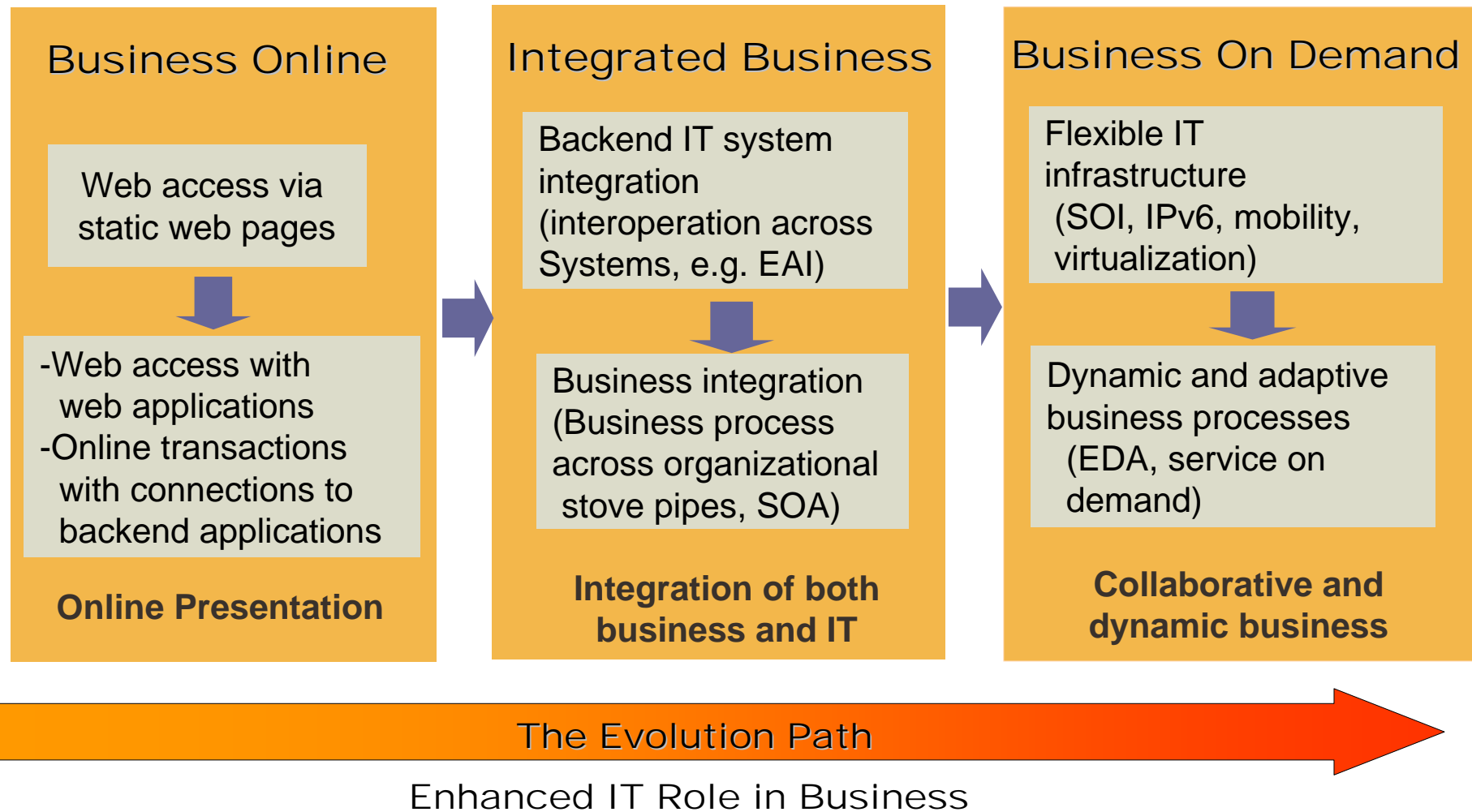
■ Past: hardware, software, and network components

■ Current: as a line of business

- separate functional areas from infrastructure commodity,
- move commonly shared services to infrastructure

● Enterprise Architecture for IT Infrastructure

Business Evolution Associated with IT



SOI and SOI Framework

- SOI is to apply SOA to IT Infrastructure
- SOI facilitates the implementation and operation of SOA-based applications and shared services
- SOI Framework
 - Provide reference for IT infrastructure segment enterprise architecture
 - Provide practice reference for SOI
 - Provide IT strategic and tactical plan input regarding to IT infrastructure
 - Provide foundation for IT infrastructure modernization

Service Oriented Infrastructure Framework

Service Oriented Infrastructure

Service Planning (Strategy, Architecture)	Service Systems (System Design & Implementation)	Service Management (Deployment & Operation)	Service Stakeholders (Cross All Services)
<ul style="list-style-type: none"> • External and Internal drivers • Strategies and objectives • Economics and business cases • Business plan and models • LoB Enterprise Architectures • Performance measurement model 	<ul style="list-style-type: none"> • Business processes and services • Application services • Data services • Infrastructure services • Servers, storages, networks • Data center facilities 	<ul style="list-style-type: none"> • System operation management • IT service management (ITIL) <ul style="list-style-type: none"> • IT service lifecycle management • Business transformation and change management • Contractual management 	<ul style="list-style-type: none"> • Business decision makers • Service providers • Service consumers • Elected officials and regulatory bodies • Industry associations and standards groups
Security			
Governance			

Service Systems Support Layered Services

For example, for the systems to support business collaboration service, its layered service description could be:

- **Business service:** enterprise collaboration service
- **Application services:** video conferencing service, enterprise messaging service, voice service, web-based collaboration, etc.
- **Infrastructure services:** unified communications, server virtualization, security, etc.
- **Physical level services:** network, servers, data center, etc.

Conclusion

Following topics are discussed, which provides a reference for how SOA can help Enterprise Architecture Practice:

- EA and SOA background
- How SOA can help EA via a SOEA model
- SOEA context and content
- SOEA practice in enterprise, applications and systems, infrastructure services
- SOEA management: lifecycle, governance, ROI