Let’s Complete Each Other: EA and SOA

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Content Summary

EA and SOA can complete each other via Enterprise Service Oriented Architecture (ESOA)

- Enterprise Architecture (EA) and its challenges
- How SOA can mitigates EA challenges
- Modeling EA in a service-oriented manner - ESOA
- Simplify ESOA modeling via horizontal and vertical partition - domain segmentation and service federation
Why We Need Enterprise Architecture

The Purpose of an Enterprise Architecture is to

- Have a blueprint and long-term guidance for an enterprise
- Facilitate decision making
- Support enterprise system modernization efforts
- Enhance collaboration and interoperation opportunities across enterprise
- Help to increase enterprise efficiency and effectiveness by 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 planning for a city

The Challenges in EA Practice

Stake Holder Participation:
- Culture, people, organization
- Stove-piped vs. collaborative

Architecture Modeling:
- Coverage of depth and width
- Interrelationship among elements
- Approaches and methodologies

Architecture Maintenance & Program Management:
- Governance & life cycle mgmt
- Involve appropriate skills and resources for the efforts

Architecture Usage:
- Architecture acceptance
- Practical for usage
- Flexible framework for evolution
Where SOA Can Compensate

**Stakeholder Participation:**
- Clarification of service ownership
- Promote collaboration via common services and service infrastructure

**Architecture Modeling:**
- Business-centric capabilities in coarse grained
- Refinement with layered service components
- Well-defined & loosely-coupled

**Architecture Maintenance & Program Management:**
- Business-centric capabilities in coarse grained
- Refinement with layered service components
- Well-defined & loosely-coupled

**Architecture Usage:**
- Service infrastructure & service authoring tools become commodity
- Flexible framework for iterative development & deployment

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 by
  - Easier communication through service-oriented concept
  - Break organization boundaries via common services
  - Create common service roadmap across organizations
  - Reduce cost via shareable and reusable services
- Paint a Clear Picture for Collaboration by
  - Common service infrastructure
  - Identification of common services
  - Clarification of roles and responsibilities regarding to service providers and consumers
  - Self-sufficient service components with manageable scope in organizational level
## Architecture Modeling

### Enterprise Architecture
- **How to Model big picture**
  - Depth and breadth of architecture scope
  - Model matches audience
  - Right level of details
  - Not to jump into details too quickly and lost big picture
- **Produce meaningful models and conceptual abstraction in addition to data artifacts collection**
  - EA vs. engineering process
  - EA approaches and methodologies vs. EA 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 components
- **SOA makes EA envisioning, planning, and modeling easier via**
  - Componentized and layered services
  - Loosely coupling
  - Iterative development
  - Matching different skills to different layers

## Architecture Usage

### Enterprise Architecture
- **Lack of EA product acceptance due to**
  - 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 loosely coupled

### 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
  - Can 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
Architecture Maintenance
& Program Management

Enterprise Architecture

- Challenge in EA lifecycle management and governance
  - Uniqueness 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
  - Building 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

An Enterprise SOA (ESOA) Model

ESOA Driver:
- Business Strategic Plan
- IT Strategic Plan

Service-Oriented Business Architecture:
- Business process model
- Business service model
- Business event model

Service-Oriented Technical Architecture:
- Layered service components
- Service infrastructure
- Data Services

Service Management and Governance Structure:
- Service life cycle management
- Service governance policies, structure, and process
What ESOA is About

**SOA is an architectural style and modeling approach independent of its implementation technologies**

- Emphasizes well-defined, loosely coupled, coarse-grained, business-centric, reusable and shared services, as well as associated infrastructure.
- Can be considered as a practical modeling approach for enterprise architecture (EA) development.
- Bridge EA with solution architecture and implementation by layered service components across business models, application models, and technology implementation.
- Bridge the business process model with service model providing a better mapping of the business requirements to IT capabilities.

What ESOA means to an Enterprise

**Business Agility**
- Business Transformation and Transition
- Collaborative Business Processes
- Business Services and Events

**IT Flexibility**
- On Demand Operation Environment
  - Federated Service Infrastructure
    - Service Development
    - Service Deployment
    - Service Operation

**Composable Business Processes & Services**
- (Business Modeling)

**Composable IT Services**
- (SOA)
ESOA Major Benefits

- **Business Agility**
  - Easier for business process improvement
  - Convenient for business operation monitoring
  - Convenient in manipulation and change of process flow via BPM tools

- **Reuse and leverage existing assets**
  - Business services can be constructed from existing components
  - Legacy systems can be accessed via web service interfaces

- **Common Infrastructure as commodity**
  - SOA infrastructure is becoming commodity by the use of COTS products
  - By enforcing standards, service components can be consolidated within a well-defined SOA infrastructure

- **Reduce development and maintenance cost**
  - Reuse of existing components will reduce development time and cost
  - Easier in incorporating new business requirements will reduce maintenance cost

- **Risk mitigation**
  - Reusing existing components reduces the risk in creating new ones
  - The commodity nature of infrastructure reduces risk in its support

Approaches and Methodologies for ESOA Practice

- **SOA Planning with Enterprise View**
  - Take advantage from Enterprise Architecture exercise
  - Create enterprise level ESOA framework include: service categorization, service infrastructure, and service owners and stake holders identification

- **Segmentation: service domain vertical partition based on (LoB)**
  - Associate with the segment enterprise architecture (proposed by Federal CIO Office for Federal EA development)
  - Separate entire enterprise service domain into segments based on the line of business services, and identify services for each LoB

- **Federation: service domain horizontal partition for service provision**
  - Associate with the federated enterprise architecture (i.e. for Federal EA development)
  - Implement and host the services based on organization autonomy
  - Implement federated service infrastructure to enable federated enterprise architecture implementation

- **Service Componentization**
  - Service component: self-contained with well-defined service interfaces
  - Service components are layered, and associated between business, application, & data
  - Components are reusable and services are sharable

- **Iterative and Incremental: top-down, bottom-up, and middle-out**
  - Adopt SOA for newly modernized environment and applications
  - Integrate with remaining legacy applications
  - Evolve legacy applications towards SOA
Enterprise Architecture Domains for Service Segmentation and Federation

Enterprise Architecture & Service Domain for Entire Enterprise

Organizational Domain
Organization A Unique Domain
Organization B Unique Domain
Enterprise-wide Architecture Framework

Segment 1
Segment 2
Segment 3
Segment 4
Service-Oriented Architecture
Service-Oriented Architecture
Service-Oriented Architecture
Service-Oriented Architecture
Federated Service Infrastructure
Federated ESOA Service Infrastructure

ESOA in Layers

* from CBDI Journal
ESOA Service Life Cycle

ESOA Drivers:
Business & IT goals, objectives, & requirements

- Service Architecture
- Service Development
- Service Deployment
- Service Operation

Design Time
Run Time

Governance

ESOA Service Life Cycle Components

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Where ESOA Applies to an Enterprise

1. Business Planning
2. IT Strategic Planning
3. Enterprise Architecture
4. Solution Development
5. Business Operation

Service-Oriented Architecture, Implementation, Deployment, and Operation

Estimate ROI for ESOA

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

Reference Matrix for ROI

IT Strategic Planning

Performance Measurement
Successful and Usable ESOA

ESOA Assessment and Maturity Models - Integration, Evolution, and Standardization

- Enterprise architecture maturity model
  - MIT, Center for Information Systems Research
  - OMB, Federal Government
  - Dept. of Commerce, Federal Government
- Service architecture maturity model
  - IBM Service Integration Maturity Model (SIIM) ?
- Service maturity model
  - Sonic (Progress Software), AmberPoint, BearingPoint, Systinet
  - HP, Oracle, EDS,

Implication of Architecture Maturity
The five maturity levels:

- **Level 0**: No architecture
- **Level 1**: Initial architecture
- **Level 2**: Under development architecture
- **Level 3**: Defined architecture
- **Level 4**: Managed architecture
- **Level 5**: Optimizing architecture
The ten maturity aspects:

- Business linkage
- Senior management involvement
- Operating unit participation
- Architecture process definition
- Architecture development
- Architecture communication
- Governance
- Program management
- Holistic enterprise architecture
- IT investment and procurement strategy

IBM SOA Maturity Model

Seven levels of service integration maturity Model for de-coupling and amount of flexibility achieved

1. Silo (data integration)
2. Integrated (application integration)
3. Componentized (functional integration)
4. Simple services (process integration)
5. Composite services (supply-chain integration)
6. Virtualized services (virtual infrastructure)
7. Dynamically reconfigurable services (eco-system integration)
SOA Service Maturity Model - Sonic, etc.

ESOA Maturity Model Standardization

**ESOA Maturity Models** - Evolution, and Standardization

- Maturity Domains
- Maturity Assessment Aspects and Success Measures
- Maturity Levels/ Stages
Conclusion

Following topics are discussed, which provides a reference for EA and SOA integration via ESOA:

- EA Benefits and Challenges
- Where SOA can compensate - ESOA model
- What ESOA is about
- What ESOA means to an enterprise
- ESOA major benefits
- Approach and Methodologies for ESOA practice
- Reference for best practices
- Assessment for a successful and usable ESOA - maturity models