Service Oriented Infrastructure for Enterprise Architecture

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Service Oriented Infrastructure (SOI) as part of Enterprise Architecture is to apply Service Oriented Architecture concept to IT infrastructure

- The changing roles of IT and IT infrastructure
- IT infrastructure, as a new line of business (LoB) in Enterprise Architecture
- Apply SOA concept to IT Infrastructure -> Service Oriented Infrastructure (SOI)
- SOI framework
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
    – Have long-term blueprint and big pictures as guidance

• **IT Infrastructure**
  • Past: hardware, software, and network components
  • Current: as a line of business

• **Enterprise Architecture for IT Infrastructure**
The Purpose of Enterprise Architecture

- Have a blueprint and long-term guidance
- Facilitate decision making
- Support enterprise modernization efforts
- Enable collaboration and interoperability
- 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
Enterprise Architecture in Context

- Strategic Planning (Business & IT)
- Solution Architecture (SOA)
- Business Operations
- Performance Management
- Enterprise Architecture (Component-Based Service-Oriented)
- Capital Planning Investment Control
- Project & Program Management

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Enterprise Architecture Components and Life Cycle

FEA
- Performance Reference Model (PRM)
- Business Reference Model (BRM)
- Service Component Reference Model (SRM)
- Data Reference Model (DRM)
- Technical Reference Model (TRM)

EA for Enterprise X
- Performance Model
  - Business Architecture
  - Application Component Architecture
  - Data Architecture
  - Technical Architecture

Strategic Planning

Performance Measurement

Enterprise IT Planning & Operation Life Cycle

Capital Planning & Investment Control

IT Initiatives

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The Progress of Federal Enterprise Architecture

• **Federation**
  - The federation model fits federal government organization structure
  - It provides horizontal partition to the complete EA domain

• **Segmentation**
  - Segments are defined based on the lines of business (LoB)
  - It provides vertical partition to the complete EA domain

• **Service Orientation**
  - A practical approach for architecture modeling and implementation
OMB has identified nine LOBs cutting across federal government:

- Budget Formulation and Execution (BFE)
- Case Management (CM)
- Federal Health Architecture (FHA)
- Financial Management (FM)
- Geospatial
- Grants Management (GM)
- Human Resources Management (HRM)
- Information Systems Security (ISS)
- Infrastructure Optimization Initiative (IOI)
Top 10 LoBs in 2008 IT Budget

*Source: Government Insights, an IDC Company*
Top Civilian Agency Sub-functions


Number = $ Millions
Business Evolution Associated with IT

Business Online
- Web access via static web pages
- Web access with web applications
- Online transactions with connections to backend applications

Business Online
- Web access via static web pages
- Web access with web applications
- Online transactions with connections to backend applications

Integrated Business
- Backend IT system integration (interoperation across Systems, e.g. EAI)
- Business integration (EA efforts across organizational stove pipes, SOA)

Business Integrated
- Web access with web applications
- Online transactions with connections to backend applications
- Integration of both business and IT

Business On Demand
- Flexible IT infrastructure (SOI, IPv6, mobility, virtualization)
- Dynamic and adaptive business processes (EDA, service on demand)
- Collaborative and dynamic business

The Evolution Path
EA, SOA, and Service Oriented Infrastructure

- SOA is a practical modeling approach for EA
- SOA bridge EA with solution architectures
- SOI is to apply SOA to IT Infrastructure
- SOI facilitates the implementation and operation of SOA-based applications and shared services
## Service Oriented Infrastructure Framework

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<td>(Strategy, Architecture)</td>
<td>(System Architecture &amp; Implementation)</td>
<td>(Deployment &amp; Operation)</td>
<td>(Cross All Services)</td>
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<td>- External and Internal drivers</td>
<td>- Business processes and services</td>
<td>- System operation management</td>
<td>- Business decision makers</td>
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<td>- Strategies and objectives</td>
<td>- Application services</td>
<td>- IT service management (ITIL)</td>
<td>- Service providers</td>
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<td>- Economics and business cases</td>
<td>- Data services</td>
<td>- Business transformation and change management</td>
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<td>- Business plan and models</td>
<td>- Infrastructure services</td>
<td>- Contractual management</td>
<td>- Elected officials and regulatory bodies</td>
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<td>- LoB Enterprise Architectures</td>
<td>- Servers, storages, networks</td>
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<td>- Industry associations and standards groups</td>
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<td>- Performance measurement model</td>
<td>- Data center facilities</td>
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### Security

### Governance
Service Planning

- Plan IT infrastructure as a line of business, and create LoB enterprise architecture accordingly
  - Establish vision, strategies, architecture for enterprise Information Management (IM) and Information Technology (IT)
  - Create a viable plan, including business models, roles and responsibilities, transition roadmap, cost model, etc.
  - Create performance measurement model based on strategic plan, which provide measurement guidance for operation.
- Governance and security processes should be applied across board
- COBIT (Control Objectives for Information and related Technology) can be a best practice reference for IT Governance
Service Systems

- **Provide system services to support**
  - Business processes and services
  - Application and data services
  - Infrastructure services

- **Strong influence from new technologies, currently in:**
  - Mobile Computing
  - Internet IPv6
  - Virtualization

- **Business oriented**
  - Support business strategies and models
  - Enable business cases
  - Facilitate business processes and operations

- **Performance driven**
  - Establish performance matrix
  - Monitor via a performance measurement system
  - Life cycle review and performance improvement
Technology Life Cycle Drives IT Investment

IT Investment

- Mainframe computer
- Personal computer
- Networked Computing & Internet
- Ubiquitous & on demand Computing

- 1956
- 1976
- 1992
- 2008
- 2024

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Service Management

- **System operation management**
  - IT Portfolio Management
  - Management of service systems (including data centers, HW, SW, networks, etc.), as well as applications and information that resides on them

- **IT service management via ITIL**
  - **Management of IT service life cycle**: service strategy, design, transition, operation, and improvement
  - **Service Strategy**: management of service model, portfolio, economics, demands, acquisition, etc.
  - **Service Design**: management of service catalog, availability, continuity, security, suppliers, sourcing alternatives, standards, as well as contractual management in licensing, SLA, costing, etc.
  - **Service Transition**: business transformation and change management, configuration management, knowledge management, deployment and evaluation management; and to ensure business continuity for the involvement of new vendors, new tools, new operation environment, etc.
  - **Service Operation**: management of incidents, requests, problems, services in all level
  - **Service Improvement**: an iterative and continuous process based on service life cycle
Service Stakeholders

- **Identify service stakeholders across board**
  - Identify all stakeholders who are relevant to IT infrastructure, such as internal and external drivers, business decision maker, service provider, service consumer, etc.

- **Separate stakeholders from structure definition**
  - Architectures, business operation processes are created independent of stakeholders
  - Perform mapping of stakeholders to individual infrastructure elements
Conclusion

This presentation discussed:

• The changing roles of IT and IT infrastructure
• The progress of Federal Enterprise Architecture, with IT Infrastructure as a new Line of Business
• Business evolution associated with IT
• SOI: apply SOA to IT infrastructure
• SOI is part of Enterprise architecture, for IT infrastructure LoB
• SOI Framework