Architecture-Driven Enterprise Integration for Federal and State Governments

Lessons learned from recent experiences architecting:
• DoD Enterprise Resource Planning IT
• DoD Enterprise Supply Chain IT
• DoD Enterprise Workflow IT
• DoD Enterprise Data Warehouse IT
• State Enterprise Resource Planning IT
• State Enterprise Customer Service IT
• State Enterprise Social Service IT
• State Corrections IT
• State First Responder IT

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Outline

• Enterprise & Solution Architectures
• Enterprise System Lifecycle

Envisioning Phase

– What envisioning achieves
– Business process reengineering (BPR) results
– Role of IT Solution Architecture
– Key lessons learned in IT envisioning
– IT Architecture Tradeoffs

• Conclusions
Solutions Comprising Enterprise Architecture
Solution Architectures are actionable plans within EA

Enterprise Architecture: Roll-up of Architectures

Customer Service Solution Architecture

Cross-Agency Business Mission Solution Architectures
Supply Chain Management, Cross-Agency Case Management, Manufacturing, etc.

Agency Solution Architectures

Back Office Solution Architecture
HR, Finance, Accounting, Budgeting, Procurement, Comm/IT, Property/Assets, Enterprise DW
Enterprise Solution Architecture Lifecycle

Typical Enterprise Solution for 50K employees has modest cost throughout lifecycle when properly planned & managed

<table>
<thead>
<tr>
<th>PHASES -&gt;</th>
<th>Business &amp; IT Envisioning</th>
<th>Requirements &amp; COTS Selection</th>
<th>Implementation &amp; Transition</th>
<th>Operations &amp; Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Skill Mix</td>
<td>80%</td>
<td>80%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>IT Skill Mix</td>
<td>20%</td>
<td>20%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Typical Team Size</td>
<td>5</td>
<td>15</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Typical Duration</td>
<td>3 months</td>
<td>9 months</td>
<td>30 months</td>
<td>15 years</td>
</tr>
<tr>
<td>Percent Total Cost of Ownership</td>
<td>Small Fraction of 1%</td>
<td>1%</td>
<td>35%</td>
<td>64%</td>
</tr>
<tr>
<td>Relative Cost of Mistakes</td>
<td>1X</td>
<td>10X</td>
<td>100X</td>
<td>1000X</td>
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</tbody>
</table>
Envisioning Phase: Transform Problems into Solutions
Envisioning is lowest cost & highest benefit architecture phase

AS IS transformed by ROADMAP which realizes VISION

BEFORE
• Business Problems
• IT Limitations
• Rogue Projects
• Under-funded IT
• Disillusionment
• Cynicism

AFTER
• Known Root Causes
• Business Process Solutions
• IT Architecture Solution
• Implementation Plan
• Cost Benefit Justification
• IT Cost & Materials
• Business and IT Rationale
• Optimism
• Buy In => Funding

Value-Added Information Gathering
Foster Solution Buy-In
Emerging Hypothesis/Transform Sessions
Incorporate Best Practices
Build COTS Market Awareness

KEANE
we get IT done
**Target Business Process, Plan, and Cost Benefits**

System pays for itself through business process improvements

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**Sample: To-Be Business Processes**

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**Sample: Implementation Plan Timeline**

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**Real Example: Business Solution**
Business Reengineering View of IT

Classic BPR view of IT resolves few technology questions
Enterprise Customer Service IT Architecture View
IT architecture planning adds value and credibility to BPR

Sample: IT-centric view of IT Solution
Assessing Legacy IT Environment
Business processes are overwhelmed by legacy IT complexity.

Legacy Module Dependencies

Sample: Enterprise Legacy Systems
Leverage Best Practices, Standards, and Guidelines
Tailor powerful ideas to strengthen and validate the solution

- Industry best-practices avoid costly reinvention
- Survey the processes and technologies of comparable enterprises
- Existing standards & guidelines capture key solution concepts
- Experienced domain IT experts validate approach & estimates
- Provide independent guidelines for follow-on, e.g. implementors
- Examples: OMB BRM/TRM, FEAF/DODAF, BMEA/FLE, SCOR, NASCIO IJIS, J2EE Core Patterns, Microsoft Enterprise Solution Patterns, IBM E-Business Patterns, etc.

Sample: Best Practices Reference Model
Source: Supply Chain Council (Keane is a member).
Architectural Tradeoffs: Functions, Hardware, Software
Solid architecture decision-making is key to solution success
Assessing Market, Technology, and Should-Costs
Architecture match to COTS components impacts feasibility

Factor: COTS Fact vs. Fiction

Marketing
Hype

Factor: Technology Maturity

Factors: COTS Market & Budget Estimation

Explain Key Technologies to Stakeholder Champions
State-of-art technologies enhance solution’s benefits

24 Hour Latency

- Flat Files
- Batch Loading
- Extraction Program
- Transfer Program
- Scheduler Program
- Transfer Program
- DB Upload Program
- Scheduler Program

Sample: Legacy Batch Transfers

Zero Latency Exchange

- Application Data Source System
- COTS EAI Adapter
- EAI Rules Development Tool
- COTS EAI Server
- EAI Operations & Maintenance Tool

Sample: Enterprise Application Integration
Conclusion: Enterprise Solution Architecture Benefits
Solution architecture yields benefits in every lifecycle phase.
Envisioning sets the strategy & guidelines for follow-on success.

Envisioning Phase
- Implementation Roadmap
- Program Credibility
- Fundability
- Fact-based Budgeting
- Feasibility Validation
- Stakeholder Buy-In

Selection Phase
- COTS Product Selections
- Deployment Architecture
- Technology Requirements
- COTS Validation
- In-Depths Plans
- Skills Requirements

Implementation Phase
- System Implementation
- Interface Specifications
- Test Specifications
- Requirements Satisfaction
- Future Reqts Flexibility
- Interoperability
- Risk Reduction

Maintenance Phase
- IT Strategic Maneuverability
- Fact-Based Change Decisions
- Preserved System/User Qualities
- Up-to-Date Specifications
  - Preserves System Investment
Enterprise Resource Planning IT Architecture View
Example of Back Office Solution Architecture
Agency Solution Architecture View
Agency architecture supports enterprise interoperability

Real Example: IT Solution