Enterprise Architecture as Strategy

Chief Architects Forum
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**CISR Research Portfolio 2002–2006**

**Managing the IT Resource**
- Effective IT Oversight
- The Future of the IT Organization
- IT Governance in Top Performing Firms
- Enterprise Architecture as Strategy
- IT Portfolio Investment Benchmarks & Links to Firm Performance
- Reducing IT-Related Risk

**IT and Business Strategy**
- An IT Manifesto for Business Agility
- Business Models and IT Investment and Capabilities
- IT-Enabling Business Innovation and Transformation

**Managing Across Boundaries**
- Effective Governance of Outsourcing
- IT Engagement Models and Business Performance

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Agenda

- Why Architecture Matters
- Envisioning a Foundation for Execution
- The Operating Model as Business Vision
  - Declaring requirements for integration and standardization
  - Identifying “the essence of the business”
- The Enterprise Architecture Journey
  - IT investment patterns and capabilities
  - Strategic implications of IT
  - Organizational learning about IT
- Critical Management Practices
- Key Lessons on Enterprise Architecture
So we started working on understanding the business strategy, and what we discovered in that process is, they really didn't have a business strategy. What they had were a lot of promises. We are going to grow. We are going to use branding. We are going to run our plants more effectively. We are going to increase our volume, but they hadn't figured out exactly how they were going to do it. And what I said was: it is very difficult for me to write an IT strategy to support your business strategy when you don't have that defined.

—IT Architect, Global Manufacturing Firm
The Result of Traditional Approaches to IT-Business Alignment

Corporate Data

Data

Applications

Technology Platforms

Corporate Networks & Infrastructure Services

Two Key Concepts

- **Operating Model:** The desired level of business process integration and business process standardization for delivering goods and services to customers.

- **Enterprise Architecture:** The organizing logic for business process and IT infrastructure capabilities reflecting the integration and standardization requirements of the firm’s operating model.
Designing a Foundation for Execution

Strategic Initiative

Core Business Processes

IT Infrastructure

Operating Model

Defines strategic limits

Enterprise Architecture

Defines core capabilities

Defines integration & standardization requirements

Learning and exploitation

Establishes priorities

Foundation for execution

• Core Business Processes
• IT Infrastructure

The Foundation for Execution at UPS

Package Tracking
Online Tools
Flex Global View
UPS Trade Direct

Industrial Engineering Model
High degree of integration & standardization across businesses

Enterprise Architecture

Redundant operations
Global communications network
Standard infrastructure
Product development process

Single package database
Standard interfaces
Customer information database
Customer relationship process

Defines strategic limits
From reliability to accessibility to agility
Defines core capabilities

Washington, D.C.’s Foundation for Execution

Benign Service Model

Enterprise Architecture

- Process standardization across programs; Integration within and among programs
- Defines strategic limits
- Defines core capabilities

Sounds of silence operations
Wide area and wireless networks
Procurement processes
Human resource processes
IT development standards
Data warehouse
Web portal
Geographic information system

Projects focused on stabilizing customer services and enabling inter-agency sharing

Ideas on ways to use infrastructure services

## Four Operating Models

<table>
<thead>
<tr>
<th>Business Process Standardization</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coordination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent but similar business units with a need to know each other’s transactions</td>
<td>Examples: Scotland Yard, Toyota Motor Marketing Europe, MetLife</td>
<td>Key IT capability: access to shared data, through standard technology interfaces</td>
</tr>
<tr>
<td>Unification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent business units with different customers and expertise</td>
<td>Examples: Johnson &amp; Johnson, Carlson Companies, GE</td>
<td>Key IT capability: provide economies of scale without limiting independence</td>
</tr>
<tr>
<td>Replication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
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<td></td>
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<tr>
<td>High</td>
<td></td>
<td></td>
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<tr>
<td>Low</td>
<td></td>
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</table>

## Focus of Standardization Differs by Operating Model

<table>
<thead>
<tr>
<th>Business Process Integration</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination</td>
<td>Unification</td>
<td></td>
</tr>
<tr>
<td>Customer and Product Data, Technology (Shared Services)</td>
<td>Technology, Customer and Product Data, Shared Services, Operations, Customer Service, Logistics (R&amp;D, Marketing/Sales)</td>
<td></td>
</tr>
<tr>
<td>Diversification</td>
<td>Replication</td>
<td></td>
</tr>
<tr>
<td>Technology (Shared Services)</td>
<td>Technology, Operations, Customer Services, Logistics, R&amp;D, Marketing/Sales, Shared Services</td>
<td></td>
</tr>
</tbody>
</table>

### Business Process Standardization

- **Low**: Technology, Customer and Product Data, Shared Services, Operations, Customer Service, Logistics (R&D, Marketing/Sales)
- **High**: Technology, Operations, Customer Services, Logistics, R&D, Marketing/Sales, Shared Services

Delta Air Lines’ Enterprise Architecture

Operational Pipeline

Allocate Resources  Prepare for Flight Departure  Load Aircraft  Flight Departure and Closeout  Monitor Flight  Flight Arrival and Closeout  Unload Aircraft  Clean/Service Aircraft

Business Reflexes

Delta Nervous System

Electronic Events

Location  Flight  Schedule  Maint.

Nine core databases

Employee Relationship Management

Customer Experience

Source: Adapted from Delta Air Lines documents – used with permission.
Enterprise Architecture for
Carlson’s Diversification Operating Model

Customer Requirements

Business Initiatives
- Travel Management
- Loyalty
- Hotel Distribution
- CRM

Enterprise Portal
- Presentation

Application

Data Trust

Middleware

Data Object

Platform

Network

Source: Carlson Company
Enterprise Architecture for MetLife’s Coordination Model

Application Presentation Tier

- Portal – Presentation Integration
  - Sign-on
  - Navigation
  - Search
  - Sessions
  - Underwriter
  - Call Center
  - Customer
  - Producer
  - Sales Office

Application Business Logic and Data Tier

- Screen Entry & Validation
  - Marketing
  - Illustrations
  - Order Entry
  - Underwriting
  - Billing/Payment
  - Service
  - Eligibility
  - Claims

- Operational Data Store
  - Security & Entitlements
  - Licensing
  - Rates & Calcs
  - Suitability
  - Forms & Requirements

- Integration Hub
  - ACORD XML
  - ACORD JLife

- Partner Portals
  - ACORD XML

- Call Center
  - Service Provider

Source: Adapted from MetLife documents – used with permission.
Enterprise Architecture for ING DIRECT’s Replication Model

**External Services**
- Prospect Fulfillment
- Statement Fulfillment
- Payments
- Checks
- Reports Local/HQ/Tax

**Customer Relationship Services**
- CIF
- CRM
- Contact History
- Product Info

**Core Banking Services**
- Mutual Funds
- Brokerage
- Banking Engine
- Credit Score

**Common Business Services**
- Transactions
- Customers
- Products
- Services

**Channel Services**
- IVR/CTI server
- Imaging server
- E-mail server
- Web server
- Gateway server

**Customer Contact:**
Call Center, IVR, E-mail, Direct mail

**Self-Service:**
Internet, MinTel, ATM, WAP, (WebTV)

Source: Robertson, D. “ING DIRECT: The IT Challenge (B)”, 2003, IMD-3-1345. Used with permission.
Architecture Maturity Stages Yield Increasing Value from IT

<table>
<thead>
<tr>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enterprise-wide technology standards</td>
<td>Standardized enterprise processes/data</td>
<td>Strategic Business Value</td>
</tr>
<tr>
<td>Locally optimal business solutions</td>
<td>Standard interfaces and business componentization</td>
<td>% of Firms</td>
<td>12% 48% 34% 6%</td>
</tr>
</tbody>
</table>

Architecture Maturity Shifts Flexibility

<table>
<thead>
<tr>
<th>Business Silos</th>
<th>Standardized Technology</th>
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</tr>
</thead>
</table>

Global Flexibility

Local Flexibility

### Implications of Architecture Maturity Stages

#### Strategic Implications of IT

<table>
<thead>
<tr>
<th>Local/Functional Optimization</th>
<th>IT Efficiency</th>
<th>Operational Efficiency</th>
<th>Strategic Agility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18%</td>
<td>21%</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>35%</td>
<td>40%</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>36%</td>
<td>25%</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Architecture Maturity**

- **IT Budget**
  - 100% (100%)
  - 85% (85%)
  - 75% (75%)
  - 120% (120%)

IT budgets from 103 firms are corrected for industry differences with Business silos as the baseline. Only five firms in stage four reported their IT budgets so data is not reliable.

Enterprise Architecture Benefits by Stages

<table>
<thead>
<tr>
<th>Architecture Stage</th>
<th>CIO Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Silos</td>
<td>0</td>
</tr>
<tr>
<td>Standardized Technology</td>
<td>1.5</td>
</tr>
<tr>
<td>Optimized Core</td>
<td>2.5</td>
</tr>
<tr>
<td>Business Modularity</td>
<td>3.5</td>
</tr>
</tbody>
</table>

- **IT Responsiveness (1)**: Development time.
- **Risk Management (2)**: Business risk, security breaches and disaster tolerance.
- **Managerial Satisfaction (3)**: Senior management and business unit management satisfaction.
- **Strategic Business Impacts (4)**: Operational excellence, customer intimacy, product leadership and strategic agility.

## Learning Requirements of the Architecture Stages

<table>
<thead>
<tr>
<th>Stage Name</th>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Capability</td>
<td>Local IT applications</td>
<td>Shared technical platforms</td>
<td>Enterprise-wide hardwired processes or databases</td>
<td>Plug &amp; play business process modules</td>
</tr>
<tr>
<td>Business Objectives</td>
<td>ROI of local business initiatives</td>
<td>Reduced IT costs</td>
<td>Cost and quality of business operations</td>
<td>Speed to market; Strategic agility</td>
</tr>
<tr>
<td>Funding Priorities</td>
<td>Individual applications</td>
<td>Shared infrastructure services</td>
<td>Enterprise applications and data stores</td>
<td>Reusable business process components</td>
</tr>
<tr>
<td>Key Management Capability</td>
<td>Technology-enabled change management</td>
<td>Design and update of standards; funding shared services</td>
<td>Core enterprise process definition and measurement</td>
<td>Management of reusable business processes</td>
</tr>
<tr>
<td>Who Defines Applications</td>
<td>Local business leaders</td>
<td>IT &amp; business unit leaders</td>
<td>Senior management and process leaders</td>
<td>IT, business and industry leaders</td>
</tr>
<tr>
<td>Key IT Governance Issues</td>
<td>Measure and communicate value</td>
<td>Establish local/regional/global responsibilities</td>
<td>Align project priorities with architecture objectives</td>
<td>Define, source &amp; fund business modules</td>
</tr>
</tbody>
</table>

## Management/Governance Practices to Formalize Learning

<table>
<thead>
<tr>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business cases</td>
<td>Architects on project teams</td>
<td>Process owners*</td>
<td>Enterprise architecture graphic*</td>
</tr>
<tr>
<td>Project methodology</td>
<td>IT Steering Committee</td>
<td>Enterprise architecture guiding principles*</td>
<td>Post-implementation assessment*</td>
</tr>
<tr>
<td></td>
<td>Architecture exception process*</td>
<td>Business leadership of project teams*</td>
<td>Technology research and adoption process*</td>
</tr>
<tr>
<td></td>
<td>Formal compliance process*</td>
<td>Senior executive oversight*</td>
<td>Full-time Enterprise Architecture team</td>
</tr>
<tr>
<td></td>
<td>Infrastructure renewal process*</td>
<td>IT Program Managers*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Centralized funding of enterprise applications*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Centralized standards team</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Reported value of asterisked items is statistically significantly related to architecture maturity stage.

### Architecture Lessons From Top Performing Companies

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Low strategic effectiveness (n=78 firms)</th>
<th>High strategic effectiveness (n=25 firms)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Senior management involvement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Senior management explicitly defined architecture requirements</td>
<td>25% (of firms)</td>
<td>44% (of firms)</td>
</tr>
<tr>
<td>• Senior management oversees architecture initiatives</td>
<td>45% (of firms)</td>
<td>60% (of firms)</td>
</tr>
<tr>
<td>• Percentage of senior managers who can describe high level architecture</td>
<td>19% (of mgrs)</td>
<td>39% (of mgrs)</td>
</tr>
<tr>
<td><strong>Architecture built into project methodology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Percentage of project teams with architects assigned</td>
<td>49% (of projects)</td>
<td>81% (of projects)</td>
</tr>
<tr>
<td>• Percentage of projects subjected to architecture compliance review</td>
<td>60% (of projects)</td>
<td>80% (of projects)</td>
</tr>
<tr>
<td><strong>Median Architecture Maturity stage (1–4)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

* Statistically significant difference between the responses of top 25% of firms on strategic effectiveness. Strategic effectiveness is measured as strategic outcomes (operational excellence, customer intimacy, product innovation, and strategic agility) of architecture initiatives weighted by their relative importance to each firm. The top 25% of firms on strategic effectiveness reported significantly higher profitability which correlated with industry adjusted measures of firm-wide profitability.
Key Findings on Enterprise Architecture

- **Build capabilities not solutions.**
  This is the only way to avoid silos and create a powerful foundation for execution.

- **Do not skip stages.**
  Generating value from architecture investments is a learning process. Aggressive investment in IT capabilities can be slow to generate a return.

- **Capture learning in management and governance practices.**
  Management requirements are more complex in later stages.

- **Persist in involving senior business managers.**
  Firms getting strategic business benefits from an operating model have senior business leaders who are actively involved in its design, management and implementation.