Enterprise Architecture: What To Tell The Management Team

Material from the book: “Enterprise Architecture as Strategy”

The Architecture and Strategy Study

• Joint effort between IMD and MIT

• Interviewed or surveyed over 150 companies in 7 countries in the US and Europe

• Quantitative survey of 103 companies in US and Europe

• Book published 8 June 2006
What is Enterprise Architecture, Why Does it Matter, and What Do We Have to Do to Fix It?

Presentation to the Management Board

Outline

• What is enterprise architecture, and how does it relate to the execution of our strategy?
• Why don’t we have the right architecture?
• Why has aligning IT with business strategy made things worse?
• What decisions do you have to make?
• How do we transform our architecture?
• How do we manage the transformation of our architecture?
• What do we do next?
The architecture of a company is like the structure of a car

Just like a car, our company has a structure

Inside our company is a foundation of business processes and IT systems that processes thousands of daily transactions.

Enterprise architecture is the organizing logic for the business processes and IT systems in our company.
A company’s architecture lets it execute some strategic initiatives well but not others

**Johnson & Johnson:**
- Over 200 operating units
- $47B in annual revenues
- Sales increases and double-digit earnings increases every year for 20 years

**J&J’s Management:**
- Autonomous management of each unit
- Different systems and processes in each unit
- Great local flexibility and fast response to changing market needs

---

**One Telco’s Challenge**

**The CEOs Broadband Challenge:**
Enter the broadband market and get one million customers in 18 months

**The Solution:**
A patchwork of incompatible processes and systems that was error-prone, expensive to run, and not scaleable
European Products Producer

**Branded products producer**: 19 different country business units, each independently managed, with separate systems, processes, and staff

**The Problems:**
- Slow to change
- Expensive to run
- Global customers took advantage

Why don’t we have the right architecture?

<table>
<thead>
<tr>
<th>Change in Environment</th>
<th>M&amp;A, or other strategic actions</th>
<th>Architectural Entropy</th>
<th>No Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Change in Environment" /></td>
<td><img src="image2.png" alt="M&amp;A, or other strategic actions" /></td>
<td><img src="image3.png" alt="Architectural Entropy" /></td>
<td><img src="image4.png" alt="No Plan" /></td>
</tr>
</tbody>
</table>
How do architectures get designed?

Because we haven’t had an overall plan, we now have IT silos that constrain our future flexibility

Corporate Networks & Infrastructure Services

- Redundancy
- Lack of integration
- Lack of standardization
Because of our architecture, we can’t execute our strategy

Outline

• What is enterprise architecture, and how does it relate to the execution of our strategy?
• Why don’t we have the right architecture?
  • Why has aligning IT with business strategy made things worse?
• What decisions do you have to make?
• How do we transform our architecture?
• How do we manage the transformation of our architecture?
• What do we do next?
How alignment **should** work

**Business management**

- Drives direction
  - You, the senior management, define our strategic priorities
  - Project teams identify and implement business changes and IT support
  - The resulting IT-supported processes help us achieve our strategic objectives

**Company Foundation**

- Core Business Processes and IT Systems

How alignment **really** works

**Business management**

- Reduced flexibility
  - Strategic statements are often promises ("get closer to our customers") or operational directives ("enter Chinese market")
  - Strategy provides too little information on long-term direction of company
  - By the time we in IT have finished our work, the strategy has changed
  - The resulting IT legacy makes us less flexible in the future
Outline

• What is enterprise architecture, and how does it relate to the execution of our strategy?
• Why don’t we have the right architecture?
• Why has aligning IT with business strategy made things worse?
  • What decisions do you have to make?
• How do we transform our architecture?
• How do we manage the transformation of our architecture?
• What do we do next?

Building capabilities: a human analogy
Building capabilities: a human analogy

To achieve greatness requires learning foundational skills so well that they become second nature
Managers need to focus on high-value activities, not routine everyday tasks

- Taking orders and delivering products
- Tracking sales patterns by product and by customer
- Understanding customer needs
- Developing innovative new products

- Taking orders and delivering products
- Tracking sales patterns by product and by customer
- Understanding customer needs
- Developing innovative new products
To support our strategy, we must first define our operating model

The operating model is our answer to two questions:
• What are the core activities in our company?
  ◦ What activities do we want to perform repeatably, flawlessly, and efficiently?
  ◦ What activities did we perform yesterday, and will we perform today and tomorrow?
• How standardized and integrated do they need to be?

The operating model:
• Focuses on the fundamental character of our company – the core activities that should be second nature
• Provides a stable view of the company
• Is more useful for guiding our IT efforts

Standardization (without integration)

Examples: Marriott Hotels
How much standardization do we need?  
(Or: how much standardization can we live with?)

Standardization:
- Simplifies operations, reduces costs, and increases efficiency
- Allows measurement, comparison, and improvement
- Provides a platform for innovation

BUT:
- Can limit local flexibility
- May require that local units replace perfectly good systems and processes with new standards
- May be politically difficult to implement
The challenge of standardizing

Performance

Country Business Units

Performance of new standard

Integration (without standardization)

Business Unit 1

Business Unit 2

Business Unit 3

Examples: MetLife, Merrill Lynch Global Private Client Group
How much integration do we need? (How much can we live with?)

Integration:
- Links efforts through shared data
- Provides transparency across the company, and the seamless flow of information across activities
- Allows us to present a single face to a customer, supplier, or partner

BUT:
- Requires common data definitions
- Can be time-consuming and difficult to implement
- Unnecessary for our units that are organized around unique customer groups
### The Operating Model

The Operating Model illustrates the relationship between Business Process Integration and Business Process Standardization. It shows how different levels of integration and standardization can impact the coordination and unification of business units.

#### Business Process Integration

- **High Integration**
  - Coordination
  - Business Unit 1
  - Business Unit 2
  - Business Unit 3
  - Customers

- **Low Integration**
  - Diversification
  - Business Unit 1
  - Business Unit 2
  - Business Unit 3
  - Customers

#### Business Process Standardization

- **Low Standardization**
  - Replication
  - Business Unit 1
  - Business Unit 2
  - Business Unit 3
  - Customers

- **High Standardization**
  - Unification
  - All Business Units
  - Customers

### Replication: ING DIRECT

ING DIRECT exemplifies the replication strategy with a high level of integration and standardization.

- **High Integration**
  - Replication
  - Business Unit 1
  - Business Unit 2
  - Business Unit 3
  - Customers

- **Low Integration**
  - Diversification
  - Business Unit 1
  - Business Unit 2
  - Business Unit 3
  - Customers

### Source


Copyright © 2006 by IMD International, Lausanne, Switzerland. Not to be used or reproduced without permission.
ING DIRECT has been able to achieve a low cost structure

- Simple products, mostly savings and simple loans
- No current account, no cash, no ATMs
- No bank branches: internet and call centers only
- Copy best practices between country business units
- Shared IT architecture and applications

![ING DIRECT Operational Costs as Percent of Assets](chart)

Average Branch Bank cost: 250 bps

ING DIRECT is one of the fastest growing companies ever

![Revenue Growth Chart](chart)

Source: Adopted from Fortune (18 October 2004)
ING DIRECT Architecture Description

External Services
- Prospect Fulfillment
- Statement Fulfillment
- Payment
- Checks
- Reports
- Call/IVR

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

Core Banking Services
- Mortgage
- Loans
- Banking
- Forensics
- Credit Score
- Products

Common Business Services
- IVR/CTI
- Imaging
- Gateway
- Server

Channel Services
- Customer-Contact: Call Center, IVR, E-mail, Direct Mail
- Self-Service: Internet, MinTel, ATM, WAP, (WebTV)

Source: Martin Vonk, CIO and COO, ING DIRECT

Unification example: Delta Airlines

Business Process Integration
- High
- Low

Business Process Standardization
- Low
- High

Delta’s Enterprise Architecture Requirements

Operational Pipeline

Customer Experience

Integration example: MetLife
MetLife’s Enterprise Architecture Requirements

Outline

• What is enterprise architecture, and how does it relate to the execution of our strategy?
• Why don’t we have the right architecture?
• Why has aligning IT with business strategy made things worse?
• What decisions do you have to make?
• How do we transform our architecture?
• How do we manage the transformation of our architecture?
• What do we do next?
Enterprise Architecture Maturity Stages

**Enterprise Architecture** is the organizing logic for business processes and IT systems in a company.

### Business Silos

- Collection of separate departments/units rather than integrated enterprise
- Separate choices made for each product, function, and segment
- Investments based on project ROI

### Enterprise Architecture Maturity Stages

**Enterprise Architecture** is the organizing logic for business processes and IT systems in a company.

#### Business Silos
- Collection of separate departments/units rather than integrated enterprise
- Separate choices made for each product, function, and segment
- Investments based on project ROI

#### Standardized Technology
- Centralized standardization of technology platforms with exception management
- Business process and IT application decisions made locally
- Investments based on cost reduction

---

#### Optimization Core
- Standardization/integration of processes and data
- Separation of decisions about processes, applications, data, and infrastructure
- Business case made on performance

---

**Source:** Enterprise Architecture as Strategy: Creating a Foundation for Execution, by J Ross, P Weill and D Robertson, Harvard Business School Press, 2006
Enterprise Architecture Maturity Stages

Enterprise Architecture is the organizing logic for business processes and IT systems in a company.

<table>
<thead>
<tr>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Collection of separate departments/units rather than integrated enterprise</td>
<td>• Centralized standardization of technology platforms with exception management</td>
<td>• Standardization/ integration of processes and data</td>
<td>• Information and process interface standards defined</td>
</tr>
<tr>
<td>• Separate choices made for each product, function, and segment</td>
<td>• Business process and IT application decisions made locally</td>
<td>• Separation of decisions about processes, applications, data, and infrastructure</td>
<td>• Business process ownership defined</td>
</tr>
<tr>
<td>• Investments based on project ROI</td>
<td>• Investments based on cost reduction</td>
<td>• Business case made on performance</td>
<td>• Business case made on time to market, flexibility</td>
</tr>
</tbody>
</table>

**IT's role in the company**

<table>
<thead>
<tr>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Explaining why things are difficult”</td>
<td>Getting IT off the critical path</td>
<td>“Happy Surprises”</td>
<td>Innovation from IT</td>
</tr>
</tbody>
</table>


---

**European Products Producer**

**Branded products producer:**
19 different country business units, each independently managed, with separate systems, processes, and staff

**The Problems:**
- Slow to change
- Expensive to run
- Global customers took advantage

**The Solution:**
- Ripped out all systems in country BUs
- Replaced with one central system
The challenge

<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></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Global Agility

Local Agility


The role of the CIO changes as companies move through the stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core/ Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Skills of the CIO:</td>
<td>Technical knowledge to help with standards decisions</td>
<td>Detailed knowledge of how the business functions</td>
<td>Ability to facilitate innovation off new platform</td>
</tr>
<tr>
<td></td>
<td>Ability to implement standard project methodology and oversight</td>
<td>Ability to manage large organizational change efforts</td>
<td>Detailed knowledge of core business - could potentially run a business unit if necessary</td>
</tr>
<tr>
<td></td>
<td>Ability to work with top management team to establish basic governance</td>
<td>Credibility with business unit or functional heads</td>
<td>Ability to delegate ownership of key process and data modules, while still ensuring adherence to standards</td>
</tr>
<tr>
<td></td>
<td>Ability to make business case for standardization</td>
<td>Ability to manage large central budget</td>
<td>Understanding of strategic benefits of architecture</td>
</tr>
</tbody>
</table>

Reports to: CEO or CFO | CEO | CEO

Percent of IT heads with second title:* 0% | 26% | 50%

* Percent of CIOs having second VP title, from sample of 26 CIOs in US and Europe

**Costs decline steadily as companies move through the stages**

![Graph showing decline in costs](image)

IT budgets are corrected for industry differences. Application silo budget is the baseline. Budgets for other stages are represented as a percentage of the baseline budget. Only five firms in stage four reported their IT budgets so data is not reliable.


**The benefits of architecture increase as companies move through the stages**

![Graph showing increase in benefits](image)

The benefits of architecture increase as companies move through the stages.

Architecture Stage Diagnostic

<table>
<thead>
<tr>
<th>IT Capability</th>
<th>Business Silos</th>
<th>Standardized Technology</th>
<th>Optimized Core</th>
<th>Business Modularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Management Practices</td>
<td>IT applications serve isolated business needs</td>
<td>Shared technical platforms cut costs, but limit choices</td>
<td>Core business processes defined; Data supporting core processes is standardized</td>
<td>Plug &amp; play business process modules with std interfaces</td>
</tr>
<tr>
<td>Technology-enabled change management</td>
<td>Technology stdns defined centrally; Exception management</td>
<td>Core processes defined and measured</td>
<td>Reusable business processes</td>
<td></td>
</tr>
<tr>
<td>Business Case for Architecture</td>
<td>ROI of applications</td>
<td>Reduced procurement costs; Reduced support costs</td>
<td>Improved business performance; service levels; predictability</td>
<td>Speed to market; flexibility; agility</td>
</tr>
<tr>
<td>Who decides</td>
<td>Local business leaders</td>
<td>IT and business unit leaders</td>
<td>Senior management and process leaders</td>
<td>Senior mgmt, IT, and local leadership</td>
</tr>
<tr>
<td>Key Governance Issues</td>
<td>Identify and manage profitable projects</td>
<td>Establish standard setting, exception &amp; funding processes</td>
<td>Determine core processes and responsibility for each</td>
<td>Define and fund business process modules</td>
</tr>
</tbody>
</table>


The problem with alignment

Business management

- Provides only vague direction
- Strategic statements are often promises (“get closer to our customers”) or operational directives (“enter Chinese market”)

- Reduces future agility
- Strategy provides little information on long-term direction of company

- Company Foundation
  - Core Business Processes and IT Systems
- By the time IT finishes its work, the strategy has changed
- The resulting IT legacy makes the company less flexible in the future

Outline

- What is enterprise architecture, and how does it relate to the execution of our strategy?
- Why don’t we have the right architecture?
- Why has aligning IT with business strategy made things worse?
- What decisions do you have to make?
- How do we transform our architecture?
  - How do we manage the transformation of our architecture?
- What do we do next?
In the mid-1980s, the US Automakers’ share of the market began to erode

![Graph showing share of US car market (%)](image)

SHARE OF US CAR MARKET (%)

- **GM and Ford**
- **Toyota and Honda**

Source: Automotive News Market Data Book, 2003

The GM and Ford response: a “big bang” update of factories

**“The Factory of the Future”**

**GM Hamtramck example:**
- $600 million investment
- 260 robots for welding, painting, assembly
- 50 automated vehicles to transport parts

**The Result:**
- Painting robots painted each other
- Welding robots smashed into cars, damaging themselves and the cars
- Assembly robots broke car windshields
- Plant required 30% more workers to produce same number of cars as comparable Japanese plants
- “The Hamtramck plant, instead of a showcase, looks more like a basket case” (Wall Street Journal)


Copyright © 2006 IMD International, Lausanne, Switzerland. Not to be used or reproduced without permission.
The Toyota response: continuous improvement

Continuous improvement:

Toyota approach:
- Slow, steady improvement, not "big bang" factory redesign
- Teams drive improvement (not top management)
- Robots assist, not replace, workers

Toyota’s continuous improvement philosophy:
- Work teams make decisions on work organization
- All production driven by customer needs (Kanban)
- Clear goal: eliminate waste in all forms
  - Overproduction
  - Idle time
  - Poor quality
  - Rework
  - Excess inventory
  - ...
- Disciplined improvement process methodology

Toyota and Honda’s bottom-up, continuous improvement approach was more successful

US MARKET SHARE (%)

Source: Automotive News Market Data Book, 2003

**What Does Toyota Do to Manage a Large Architectural Change?**

**Toyota's European Challenge**
- Sales are growing dramatically:
  - 384,000 units in 1995
  - 806,000 units in 2006 (est.)
  - Goal: 1.2M units by 2010
- Toyota Europe structured as independently managed country operations:
  - All product and spare parts inventories managed within countries
  - Little transparency of supply and demand
  - Different systems and processes in each country

**Toyota's Decision:**
Toyota Europe must act as a single entity:
- Greater control over operations
- Increased transparency of supply and demand chains
- More sharing of best practices and standardization of processes

---

**Toyota Motor Marketing Europe’s operating model**

<table>
<thead>
<tr>
<th>Business Process Integration</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Required”: transparency for virtual supply and demand chain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Desirable”: standardized systems to reduce cost</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Process Standardization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

**1999 position:**
Decentralized independent country operations

---

Source: Presentation by Peter Heinicke, Chief Architect, Toyota Motor Marketing Europe to IMD OWP Program, June 30, 2005.
Toyota’s Answer: Engagement

The “Missing Link”: Linking Mechanisms
**Linking at Toyota Europe**

- Implemented funding mechanisms to ensure projects met strategic and architectural goals.
- Surveyed ongoing projects to develop strategic principles.
- Changed project process to get enterprise architects involved earlier and scope projects better.
- Installed disciplined project process (Unified Process).
- Rewarded project architects primarily on project success, secondarily on architecture compliance.
- Assigned project architects to each team, with responsibility for specific deliverables.

**Toyota’s Results**

**Architectural Compliance:**
- 26% of projects compliant with enterprise architecture in 2001; 93% compliant in 2004.
- Degree to which enterprise architecture enables strategic initiatives up by 76% between 2002 and 2005.

**Overall Performance:**
- European delivery lead time for vehicles reduced by 35%.
- Inventory of spare parts reduced by almost 50%.
- Net income in Europe went from a loss in 2002 to 3.5% of sales in 2004.

"If you have good engagement, most architecture efforts get funded through the projects. The projects need to do the work anyway, so all you’re doing is asking them to do the work in an architecturally sound way. The cost of doing something right is usually no greater, and often leads to overall savings for the project.”

- Peter Heinckens, Chief Architect, TMME

Source: Presentation by Peter Heinckens, Chief Architect, Toyota Motor Marketing Europe to IMD OWP Program, June 30, 2005.
Seven questions about engagement

**Top down questions:**
- What mechanisms do our IT governance bodies use to reach and enforce their decisions?
- How do these engagement mechanisms interact with our projects?
- How do we coordinate our different projects?
- What linking mechanisms connect our projects to business leadership? To IT leadership? To IT architects?

**Bottom-up questions:**
- If you were to attach yourself to a project and follow it from inception to completion, what linking mechanisms would it experience?
- For each mechanism, who provides inputs and who is authorized to make the final decision?
- How do these mechanisms enable or constrain business-IT alignment across the company?

---

**A test: attach yourself to a project**

<table>
<thead>
<tr>
<th>Inception</th>
<th>Elaboration</th>
<th>Construction</th>
<th>Transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision Gate</td>
<td>Baseline Architecture Gate</td>
<td>Initial Capability Gate</td>
<td>Product Release Gate</td>
</tr>
</tbody>
</table>

**Project Manager Certification**
- Teaches project managers about project process
- Shows the value of adhering to company architecture

**Funding Review Board**
- Reviews and approves business case

**Informal Project Reviews**
- Reviews initial solution for architectural compliance
- Provides ideas for improvement

**Exceptions Management Process**
- Reviews and approves exceptions to the enterprise architecture

**Architecture Group**
- Regularly reviews exceptions
- Incorporates best thinking into architecture

**Transformation Board**
- Commissions projects and approves funding

**Project Review Board**
- Reviews ongoing progress of projects
The Toyota approach to architecture change

### Toyota’s manufacturing improvement philosophy:
- Teams drive improvement (not top management)
- All production driven by customer needs (Kanban)
- Clear goal: eliminate waste in all forms
- Work teams make decisions on work organization (together with management)
- Slow, steady improvement, not “big bang” factory redesign
- Disciplined improvement process methodology

### Toyota’s architecture transformation philosophy:
- Business projects drive improvement (not centralized architecture team)
- All architecture transformation driven by customer needs
- Clear goal: improve transparency across supply and demand chain to reduce waste
- Project teams make decisions on architecture (together with architecture team)
- Project-by-project improvement, not “big bang” transformation
- Disciplined project methodology


### Outline

- What is enterprise architecture, and how does it relate to the execution of our strategy?
- Why don’t we have the right architecture?
- Why has aligning IT with business strategy made things worse?
- What decisions do we have to make?
- How do we transform our architecture?
- How do we manage the transformation of our architecture?
- What do we do next?
## The six month plan

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Design Operating Model</th>
<th>Set up Engagement Model</th>
<th>Begin Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Tasks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Create list of major processes and data</td>
<td>• Split architecture group into enterprise and project architects; restructure incentives</td>
<td>• Create project management training on architecture</td>
<td>• Design detailed architecture for critical areas</td>
</tr>
<tr>
<td>• Update the “as-is” architecture and its effects on the business</td>
<td>• Draw one-page diagram based on operating model</td>
<td>• Assign project architects to critical current projects</td>
<td>• Redesign solutions for current projects</td>
</tr>
<tr>
<td>• Collet and summarize all current business improvement initiatives (IT-related or not)</td>
<td>• Two-day offsite meeting to define operating model</td>
<td>• Put in place standard project methodology</td>
<td>• Jointly review progress of all projects</td>
</tr>
<tr>
<td>Both Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Tasks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Each management team member create list of his/her own operating model processes</td>
<td>• Match current projects to operating model priorities</td>
<td>• Decide who is in charge of major processes and who owns critical data</td>
<td>• Restructure and refocus projects based on operating model priorities</td>
</tr>
<tr>
<td>• Collect and summarize all current business improvement initiatives (IT-related or not)</td>
<td>• Restructure, combine, or kill projects based on operating model priorities</td>
<td>• Assign exec sponsor to each initiative</td>
<td>• Launch new projects as needed</td>
</tr>
<tr>
<td>• Design detailed architecture for critical areas</td>
<td>• Redesign solutions for current projects</td>
<td>• Put in place standard project methodology</td>
<td>• Jointly review progress of all projects</td>
</tr>
</tbody>
</table>

## Summary

- Enterprise architecture is the organizing logic for the foundation of our company: our business processes and IT systems
- Our architecture is hindering the execution of our strategy
- To begin, we need to define our operating model
- After we understand and agree on our operating model, we can design our architecture and begin the transformation
- The transformation of our architecture will take years, but we will begin to see the benefits immediately
- With good engagement, we can implement our architecture project by project, and continuously improve it as we go