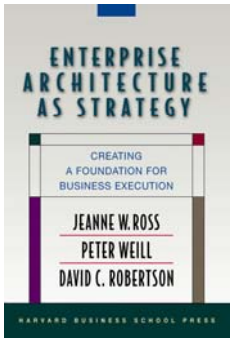
Enterprise Architecture: What To Tell The Management Team

Material from the book: "Enterprise Architecture as Strategy"

David Robertson
November 2006

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

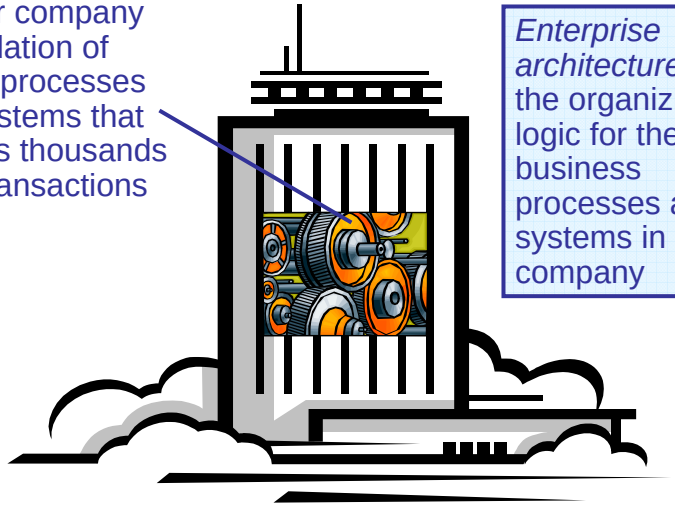
Outline

- 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:

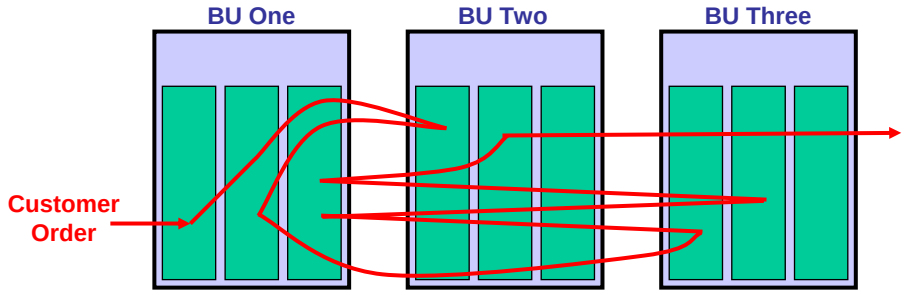
- Autonomous management of each unit
- Different systems and processes in each unit
- Great local flexibility and fast response to changing market needs

IMD

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

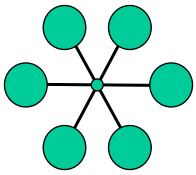


IMD

European Products Producer

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

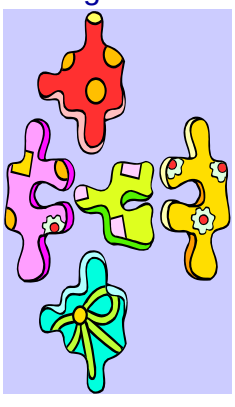
The Problems:
- Slow to change
- Expensive to run
- Global customers took advantage



Why don't we have the right architecture?

Change in Environment

M&A, or other strategic actions

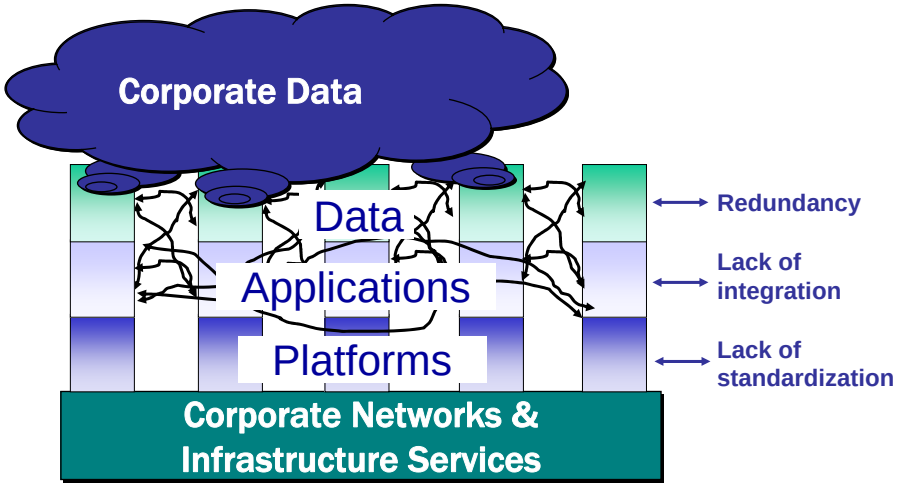


Architectural Entropy

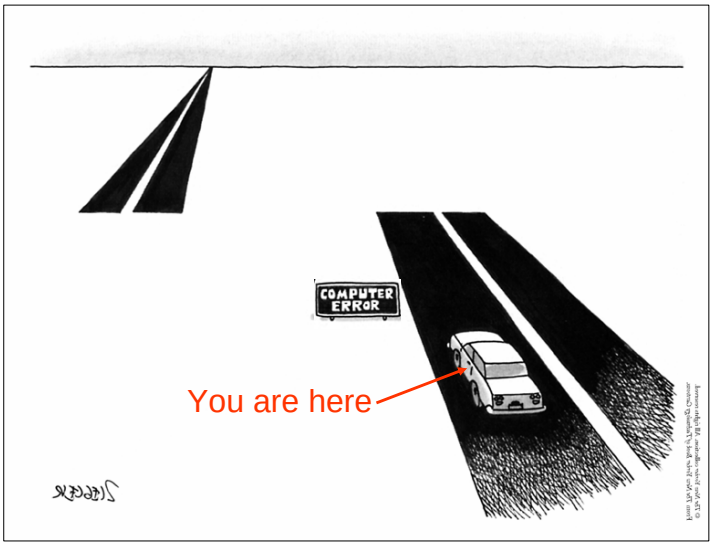
No Plan

How do architectures get designed?

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



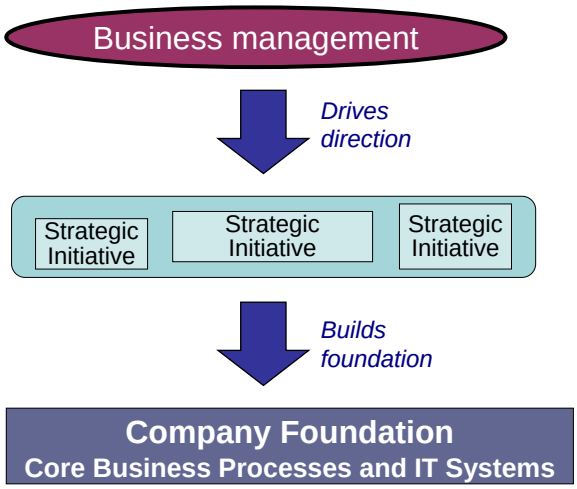
Because of our architecture, we can't execute our strategy



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

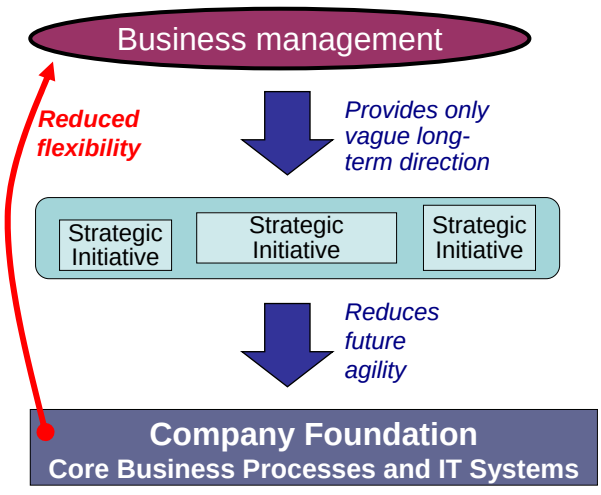


You, the senior management, define our strategic priorities

Project teams identify and implement business changes and IT support

The resulting IT-supported processes help us achieve our strategic objectives

How alignment *really* works



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

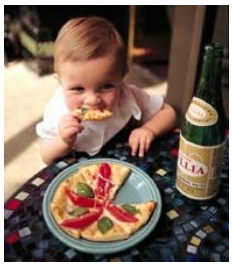
The resulting IT legacy makes us *less* flexible in the future

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?

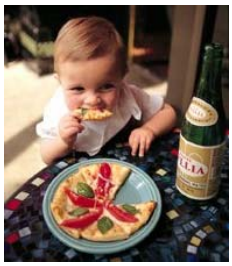
IMD

Building capabilities: a human analogy



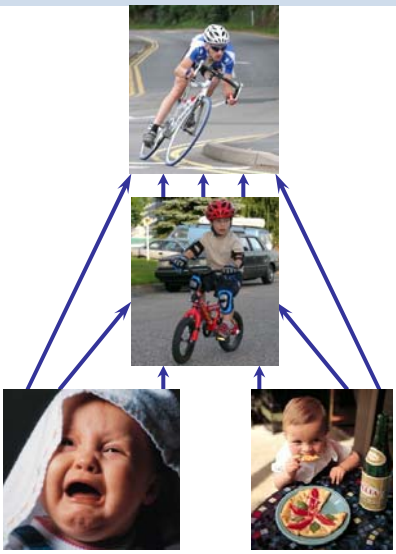
IMD

Building capabilities: a human analogy

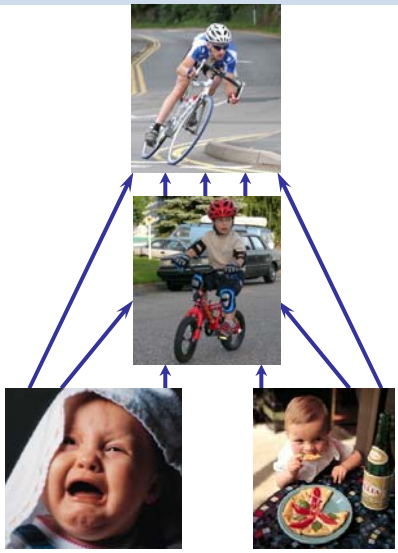

IMD

To achieve greatness requires learning foundational skills so well that they become second nature



IMD

Managers need to focus on high-value activities, not routine everyday tasks

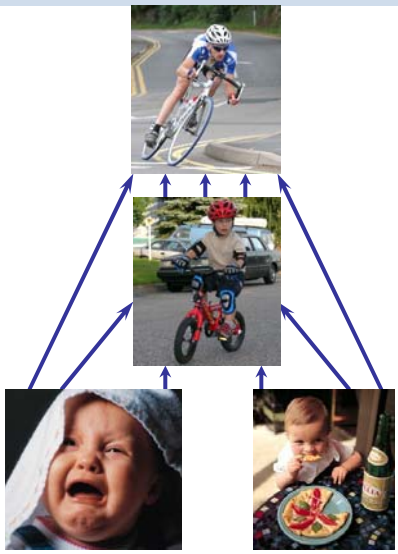


Taking orders and delivering products

Tracking sales patterns by product and by customer

IMD

Managers need to focus on high-value activities, not routine everyday tasks



Developing innovative new products

Understanding customer needs

Taking orders and delivering products

Tracking sales patterns by product and by customer

IMD

To support our strategy, we must first define our *operating model*

The operating model is our answer to two questions:

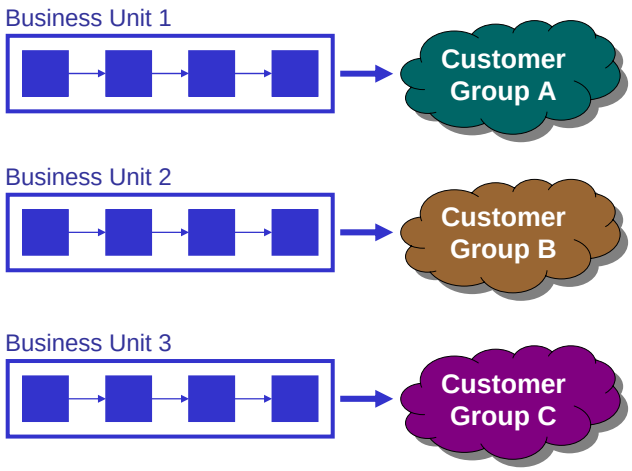
- What are the core activities in our company?
  - What activities do we want to perform repeatably, flawlessly, and efficiently?
  - What activities did we perform yesterday, and will we perform today and tomorrow?
- How standardized and integrated do they need to be?

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

IMD

Standardization (without integration)



Examples: Marriott Hotels

IMD

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

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

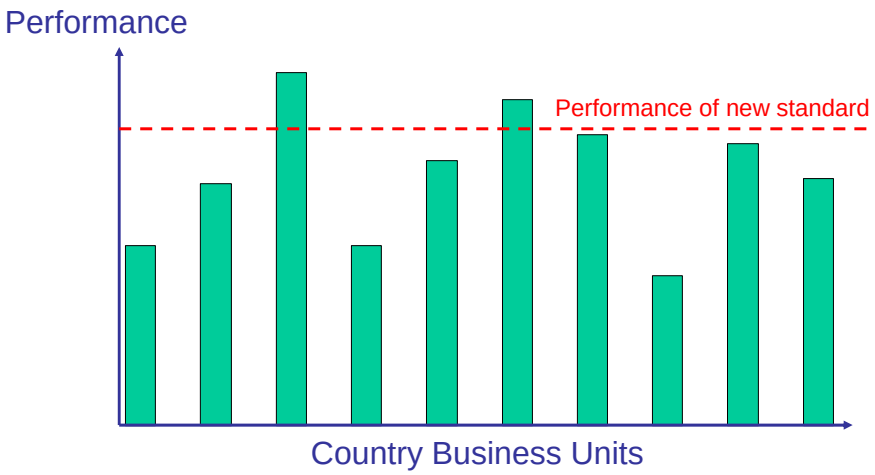
Standardization:

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

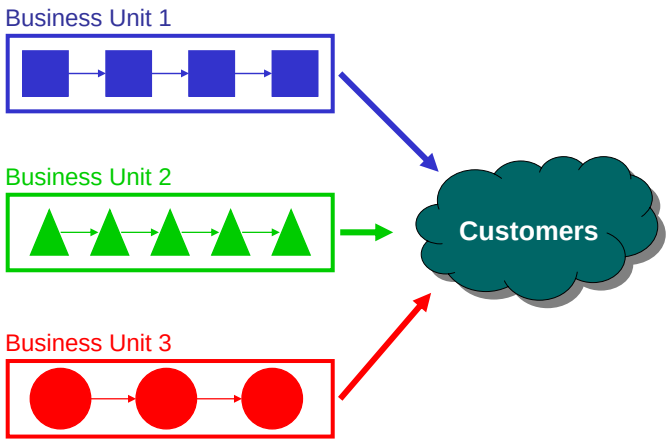
BUT:

- 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



Integration (without standardization)



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

How much integration do we need? (How much can we live with?)

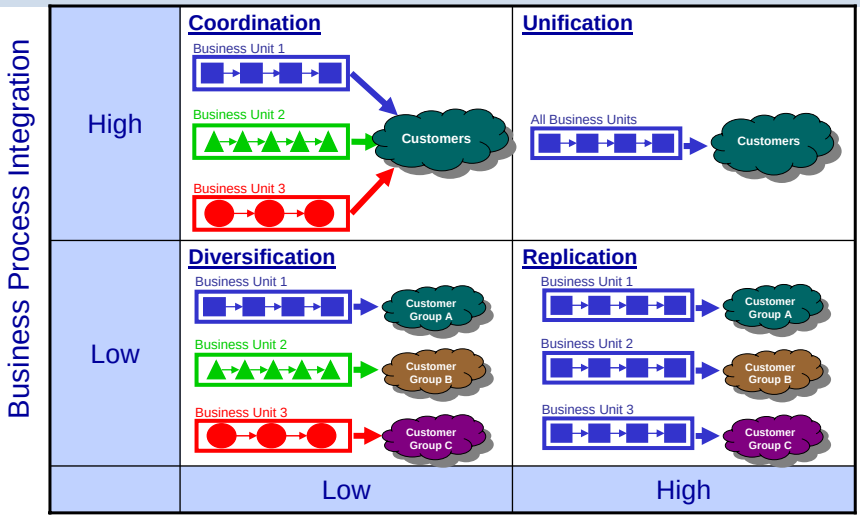
Integration:

- 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:

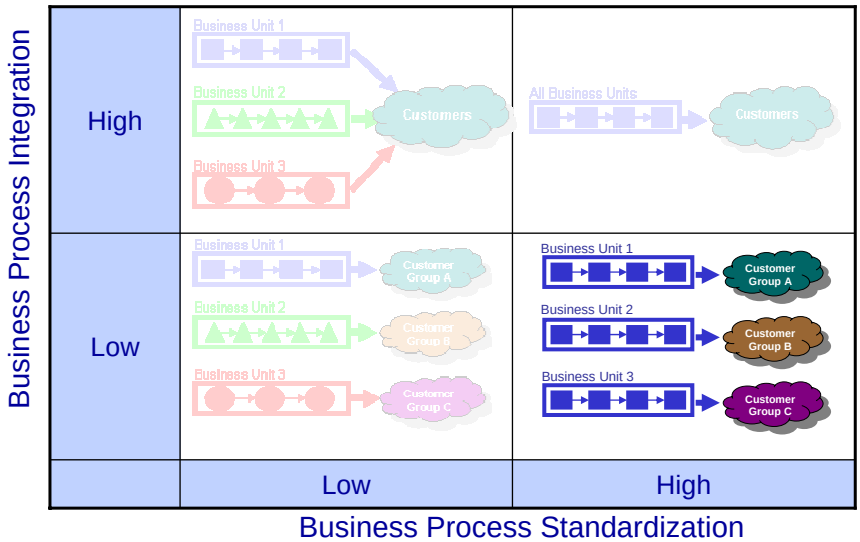
- Requires common data definitions
- Can be time-consuming and difficult to implement
- Unnecessary for our units that are organized around unique customer groups

The Operating Model



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

Replication: ING DIRECT



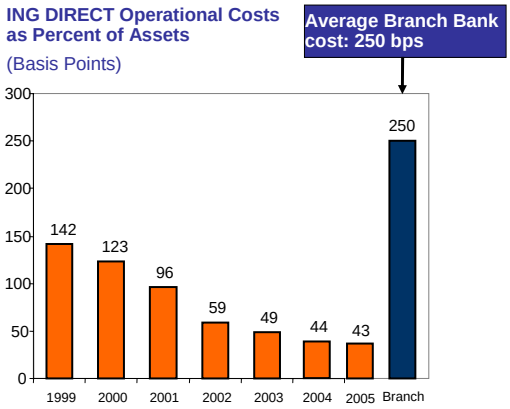
Source: *Enterprise Architecture as Strategy: Creating a Foundation for Execution*, by J Ross, P Weill and D Robertson, Harvard Business School Press, 2006

ING DIRECT has been able to achieve a low cost structure

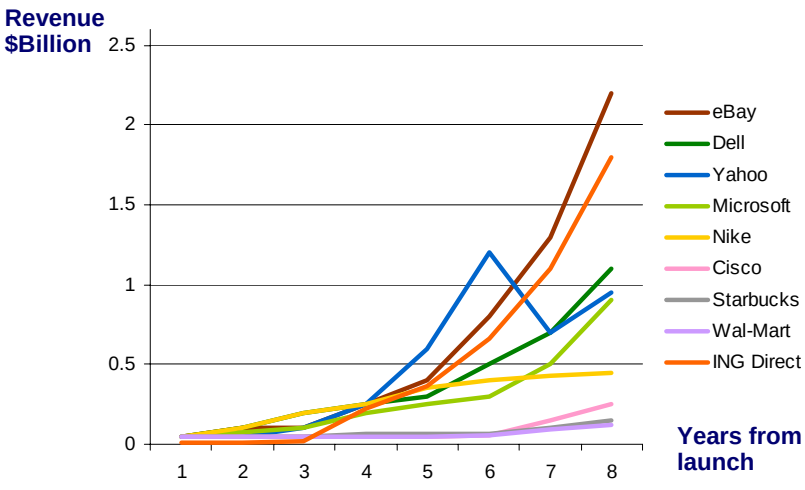
- Simple products, mostly savings and simple loans
- No current account, no cash, no ATMs
- No bank branches: internet and call centers only
- Copy best practices between country business units
- Shared IT architecture and applications

ING DIRECT Operational Costs as Percent of Assets

(Basis Points)

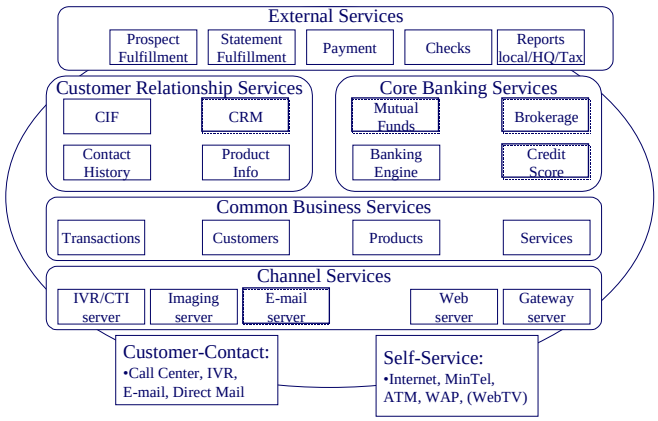


ING DIRECT is one of the fastest growing companies ever



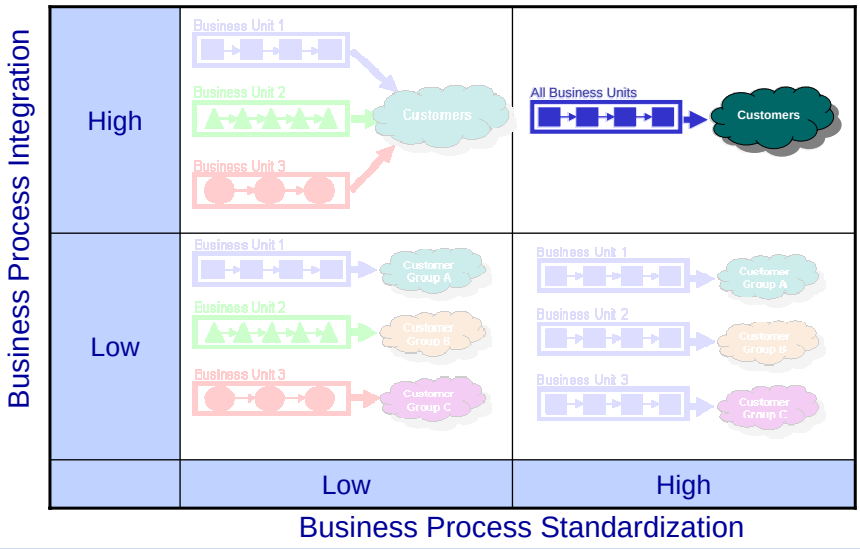
Source: Adopted from Fortune (18 October 2004)

ING DIRECT Architecture Description



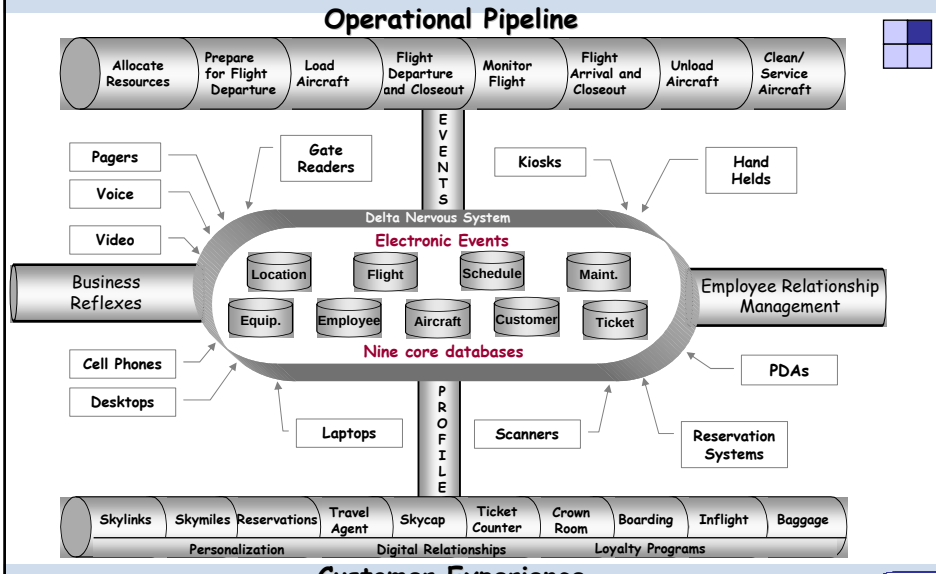
Source: Martin Vonk, CIO and COO, ING DIRECT

Unification example: Delta Airlines



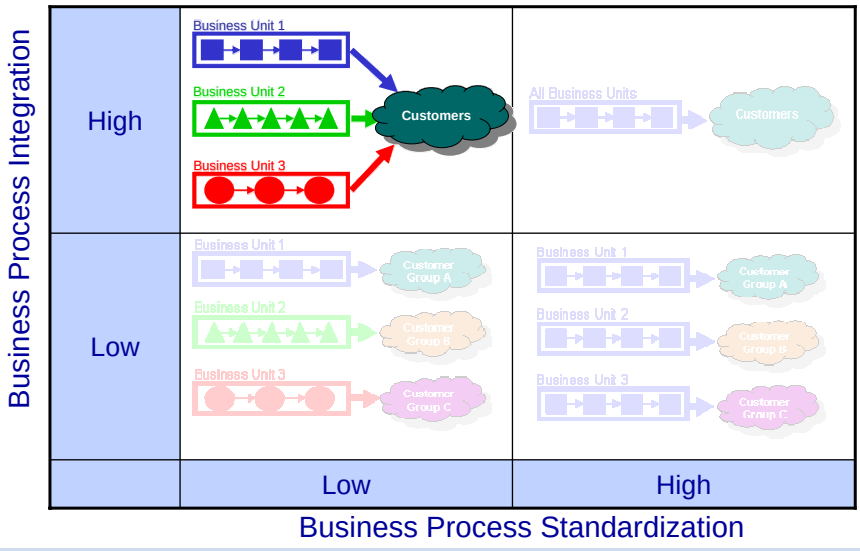
Source: *Enterprise Architecture as Strategy: Creating a Foundation for Execution*, by J Ross, P Weill and D Robertson, Harvard Business School Press, 2006

Delta's Enterprise Architecture Requirements



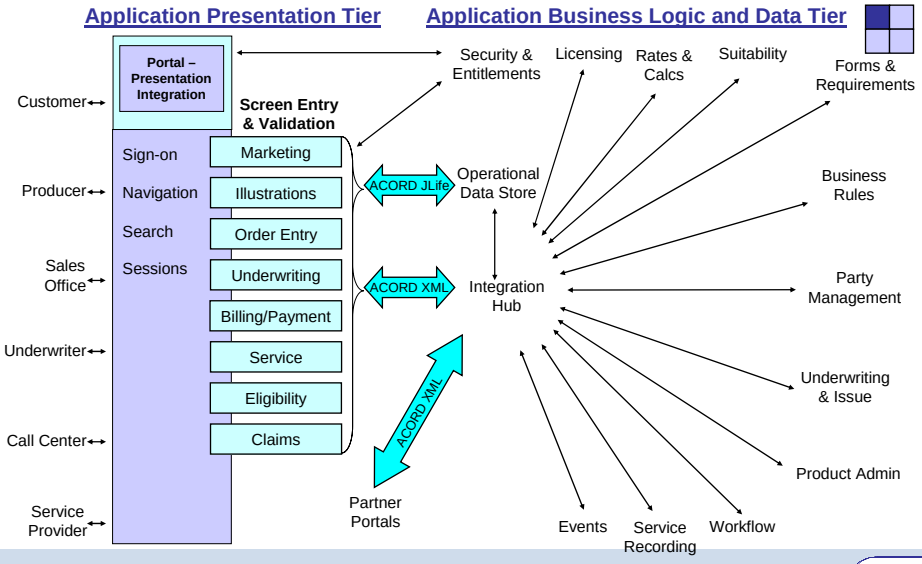
Source: Adapted from Delta Air Lines documents – used with permission

Integration example: MetLife



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

MetLife's Enterprise Architecture Requirements



Source: Adapted from MetLife documents – used with permission

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

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

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**

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

Copyright 2006 © by IMD International, Lausanne, Switzerland
Not be used or reproduced without permission

Enterprise Architecture Maturity Stages

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

Business Silos	Standardized Technology
• Collection of separate departments/units rather than integrated enterprise • Separate choices made for each product, function, and segment • Investments based on project ROI	• Centralized standardization of technology platforms with exception management • Business process and IT application decisions made locally • Investments based on cost reduction

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

Business Silos	Standardized Technology	Optimized Core
• Collection of separate departments/units rather than integrated enterprise • Separate choices made for each product, function, and segment • Investments based on project ROI	• Centralized standardization of technology platforms with exception management • Business process and IT application decisions made locally • Investments based on cost reduction	• 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

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

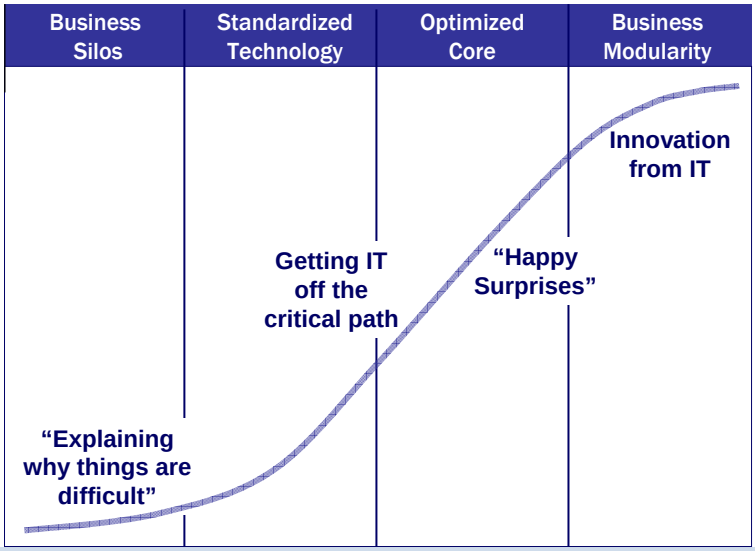
Source: *Enterprise Architecture as Strategy: Creating a Foundation for Execution*, by J Ross, P Weill and D Robertson, Harvard Business School Press, 2006

Enterprise Architecture Maturity Stages

Business Silos	Standardized Technology	Optimized Core	Business Modularity
• Collection of separate departments/units rather than integrated enterprise • Separate choices made for each product, function, and segment • Investments based on project ROI (12)	• Centralized standardization of technology platforms with exception management • Business process and IT application decisions made locally • Investments based on cost reduction (48)	• Standardization/ integration of processes and data • Separation of decisions about processes, applications, data, and infrastructure • Business case made on performance (34)	• Information and process interface standards defined • Business process ownership defined • Business case made on time to market, flexibility (6)

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

IT's role in the company



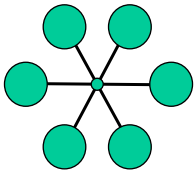
Source: *Enterprise Architecture as Strategy: Creating a Foundation for Execution*, by J Ross, P Weill and D Robertson, Harvard Business School Press, 2006

IMD

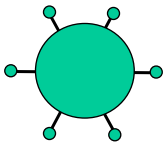
European Products Producer

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

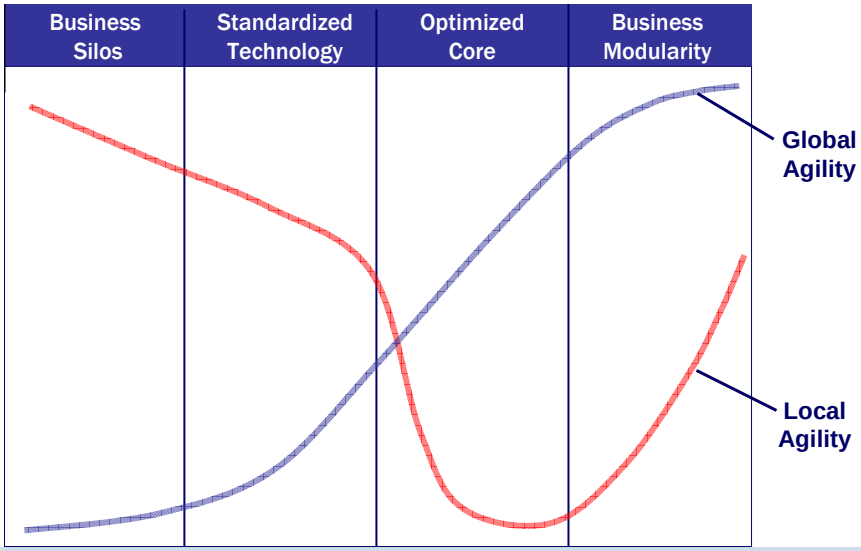


The Solution:
- Ripped out all systems in country BUs
- Replaced with one central system



IMD

The challenge



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

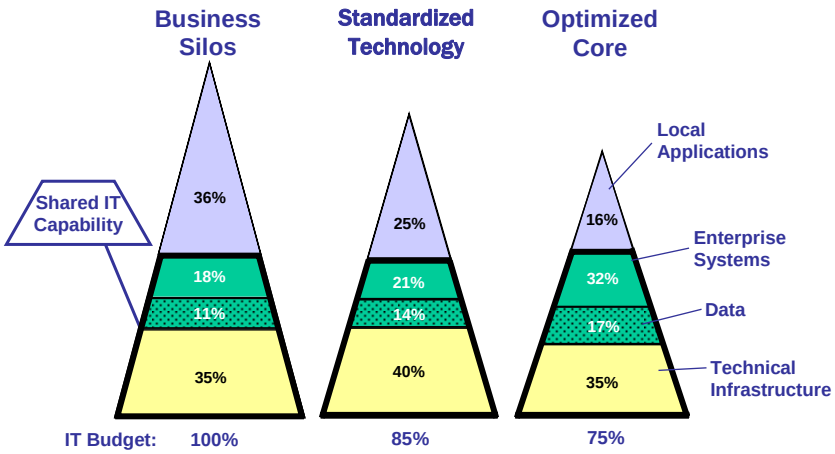
The role of the CIO changes as companies move through the stages

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

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

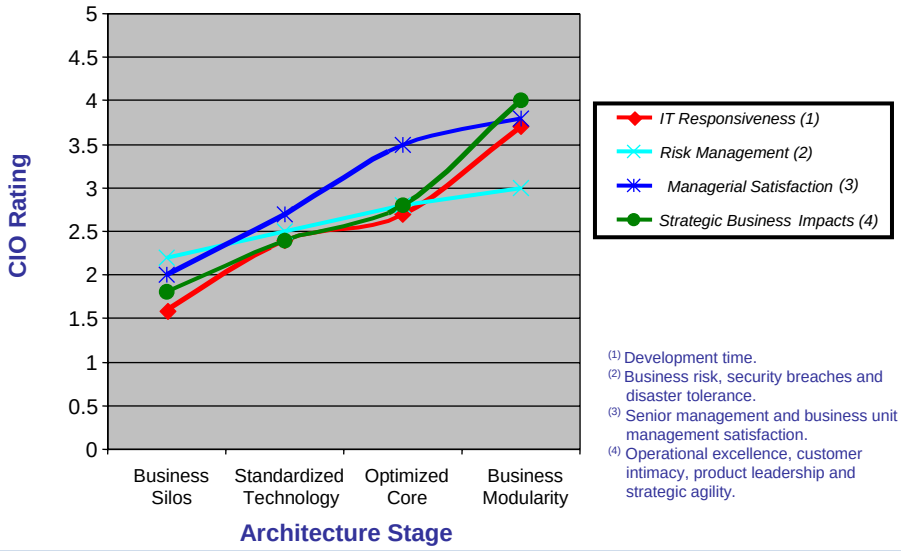
Costs decline steadily as companies move through the stages



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.

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

The benefits of architecture increase as companies move through the stages



(1) Development time.
(2) Business risk, security breaches and disaster tolerance.
(3) Senior management and business unit management satisfaction.
(4) Operational excellence, customer intimacy, product leadership and strategic agility.

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

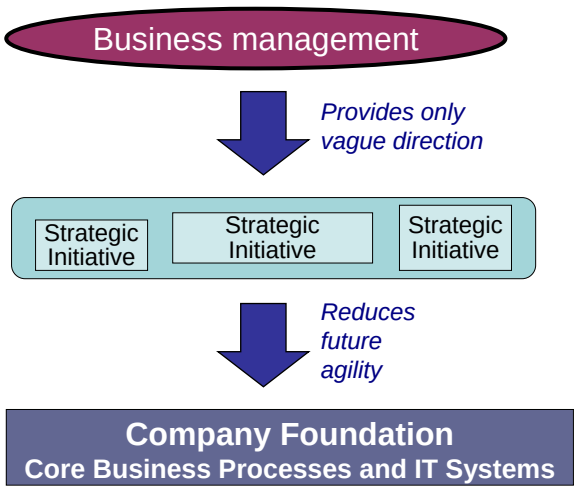
Architecture Stage Diagnostic

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

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

IMD

The problem with alignment



Strategic statements are often promises ("get closer to our customers") or operational directives ("enter Chinese market")

Strategy provides little information on long-term direction of company

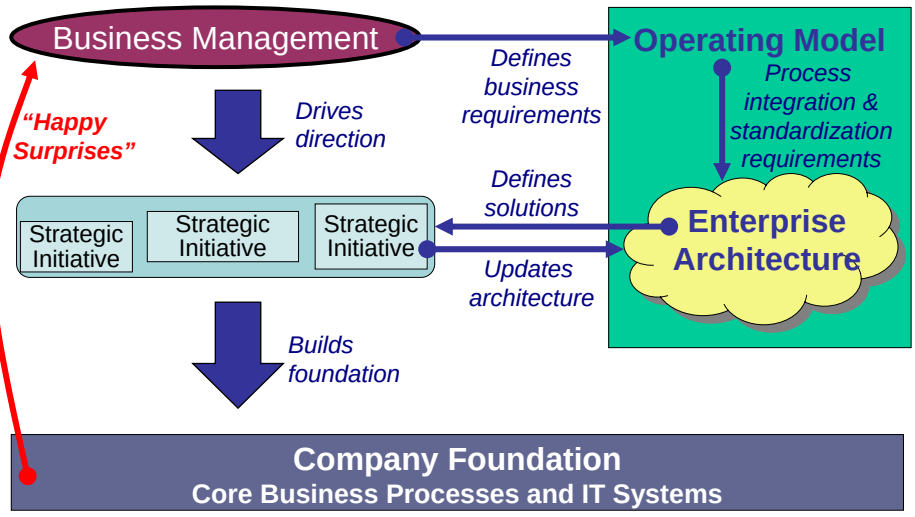
By the time IT finishes its work, the strategy has changed

The resulting IT legacy makes the company *less* flexible in the future

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

IMD

Architecture guarantees alignment

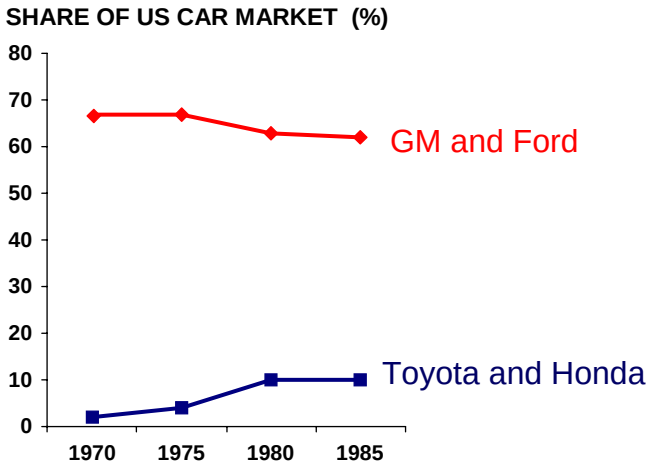


Source: *Enterprise Architecture as Strategy: Creating a Foundation for Execution*, by J Ross, P Weill and D Robertson, Harvard Business School Press, 2006

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



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)

Source: Wall Street Journal, May 13, 1986; M Keller, *Rude Awakening*.

The Toyota response: continuous improvement

Continuous improvement:

Toyota approach:

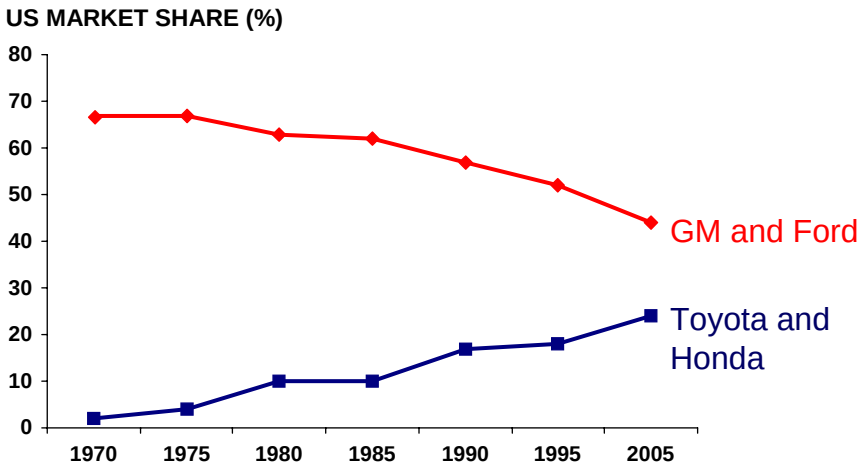
- Slow, steady improvement, not "big bang" factory redesign
- Teams drive improvement (not top management)
- Robots assist, not replace, workers

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

Source: K. Suzaki *The New Manufacturing Challenge*, 1987; Womack, Jones, and Roos *The Machine That Changed the World*, 1990; S Shingo *The Toyota Production System*, 1989.

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



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

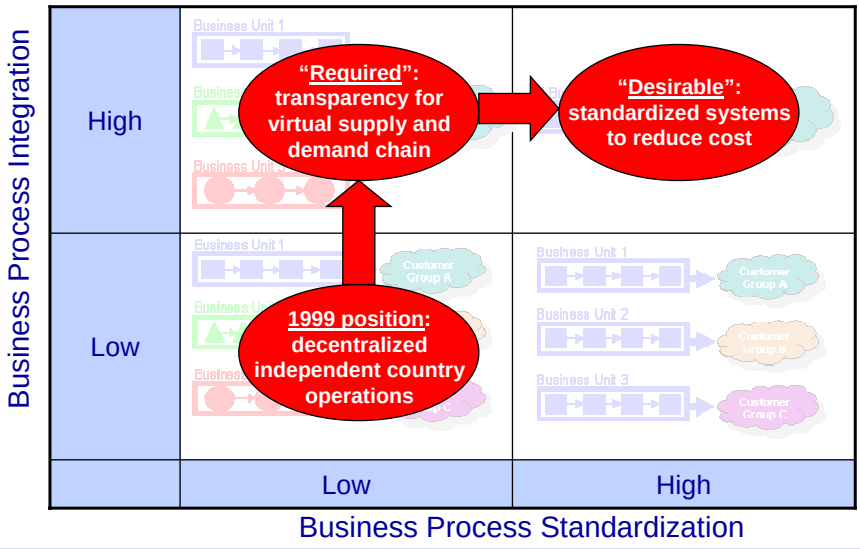
Toyota's Decision:

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

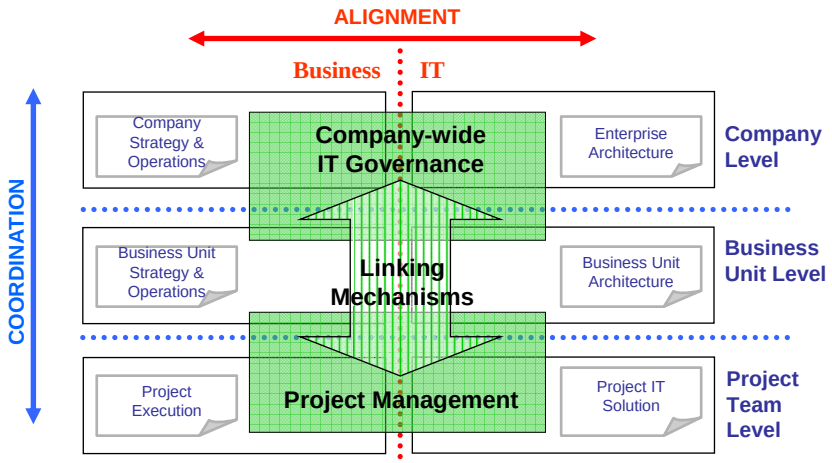
Source: Presentation by Peter Heinckiens, Chief Architect, Toyota Motor Marketing Europe to IMD OWP Program, June 30, 2005.

Toyota Motor Marketing Europe's operating model



Source: Presentation by Peter Heinckiens, Chief Architect, Toyota Motor Marketing Europe to IMD OWP Program, June 30, 2005.

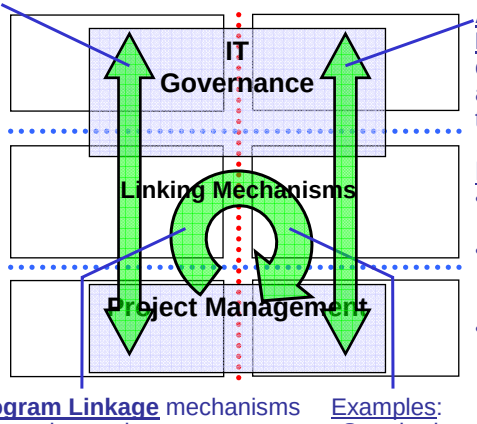
Toyota's Answer: Engagement



The "Missing Link": Linking Mechanisms

Business Linkage mechanisms connect projects to company and business unit strategies

Examples:
- Business process owners
- Periodic reviews of projects
- Balanced scorecard
- Incentives tied to company goals



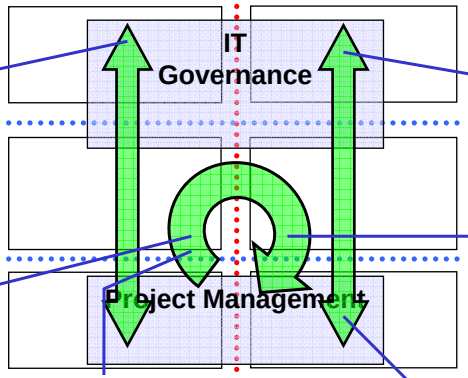
Architecture Linkage mechanisms connect projects to architecture transformation efforts

Examples:
- Early solution reviews
- Architecture exception management
- Project architects on teams

Program Linkage mechanisms ensure that projects are accessible and that projects attack the right problems

Examples:
- Standard project methodology
- Inter-project coordination
- Project manager certification

Linking at Toyota Europe



Implemented funding mechanisms to ensure projects met strategic and architectural goals

Surveyed ongoing projects to develop strategic principles

Assigned project architects to each team, with responsibility for specific deliverables

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

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 Heinckiens, Chief Architect, TMME

Source: Presentation by Peter Heinckiens, Chief Architect, Toyota Motor Marketing Europe to IMD OWP Program, June 30, 2005.

Seven questions about engagement

Top down questions:

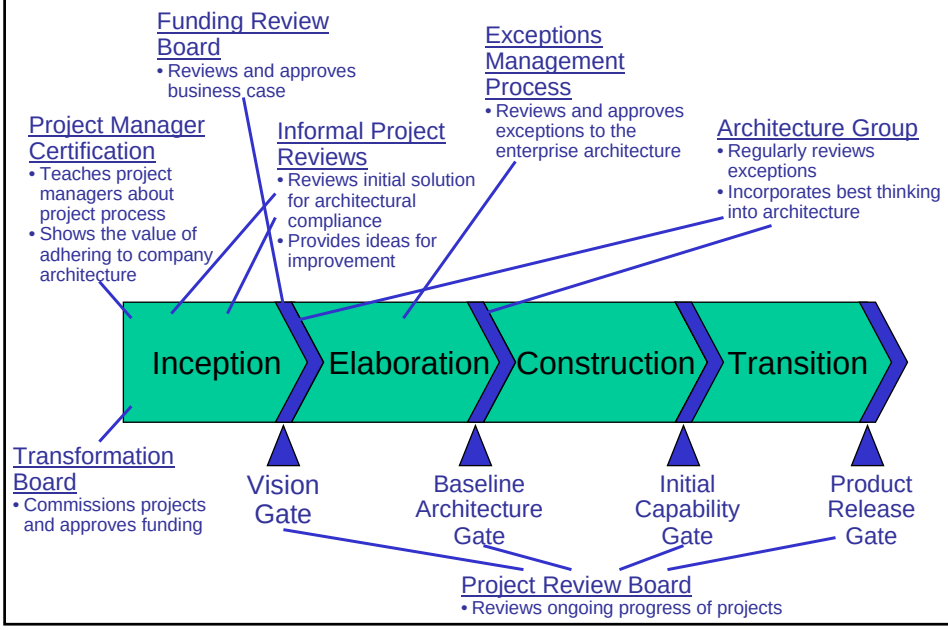
- What mechanisms do our IT governance bodies use to reach and to enforce their decisions?
- How do these engagement mechanisms interact with our projects?
- How do we coordinate our different projects?
- What linking mechanisms connect our projects to business leadership? To IT leadership? To IT architects?

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?

IMD

A test: attach yourself to a project



The Toyota approach to architecture change

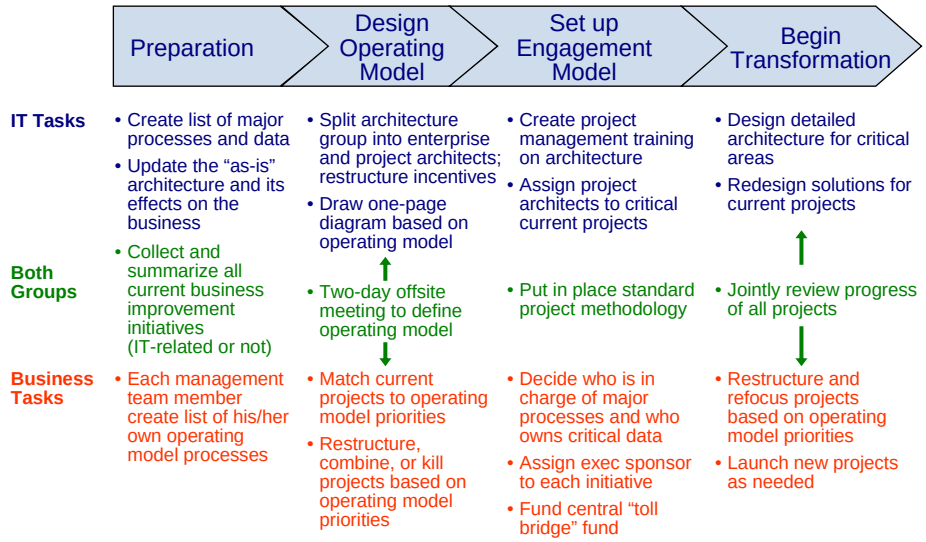
Toyota's manufacturing improvement philosophy:	Toyota's architecture transformation philosophy:
• Teams drive improvement (not top management)	• Business projects drive improvement (not centralized architecture team)
• All production driven by customer needs (Kanban)	• All architecture transformation driven by customer needs
• Clear goal: eliminate waste in all forms	• Clear goal: improve transparency across supply and demand chain to reduce waste
• Work teams make decisions on work organization (together with management)	• Project teams make decisions on architecture (together with architecture team)
• Slow, steady improvement, not "big bang" factory redesign	• Project-by-project improvement, not "big bang" transformation
• Disciplined improvement process methodology	• Disciplined project methodology

Source: K. Suzaki *The New Manufacturing Challenge*, 1987; Womack, Jones, and Roos *The Machine That Changed the World*, 1990; S Shingo *The Toyota Production System*, 1989.

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



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