MAKING MAGICAL CONNECTIONS

Case Study: Leveraging SOA and MDA to transform the IT organization

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October 16, 2006

OMG Workshop: Building a Service Oriented Architecture with BPM and MDA

Topics

- Business Drivers & IT Strategy
  - What's causing the change?

- Changes identified

- MDA Case Study Metrics

- Lessons Learned and Organizational Issues encountered

Business Drivers

- All Parks & Resorts are merging into a single Business Segment
  - Better project alignment
  - Elimination of duplicate initiatives
  - Leveraging common system functionality
- Business Needs Aren't Being Fully Met
  - Delivery is too slow & very costly
  - Functionality is often cut to meet budgets and timelines
  - Too many resources spent nursing/maintaining systems
- Business Agility is Hampered
  - The business can't react quickly to market conditions
  - System quality is sacrificed for dates and cost
  - Results in highly complex systems that are inflexible

WDP&R Segment IT Transformation - Priorities

The 5 Prime Directives

1. Enable the business – drive value
2. Drive innovation and differentiation
3. Drive speed and efficiency
4. Drive leverage at the segment and at the enterprise
5. Drive cast and talent development

Drive innovation and speed of project delivery
Proactively leverage IT services at the enterprise and the segment

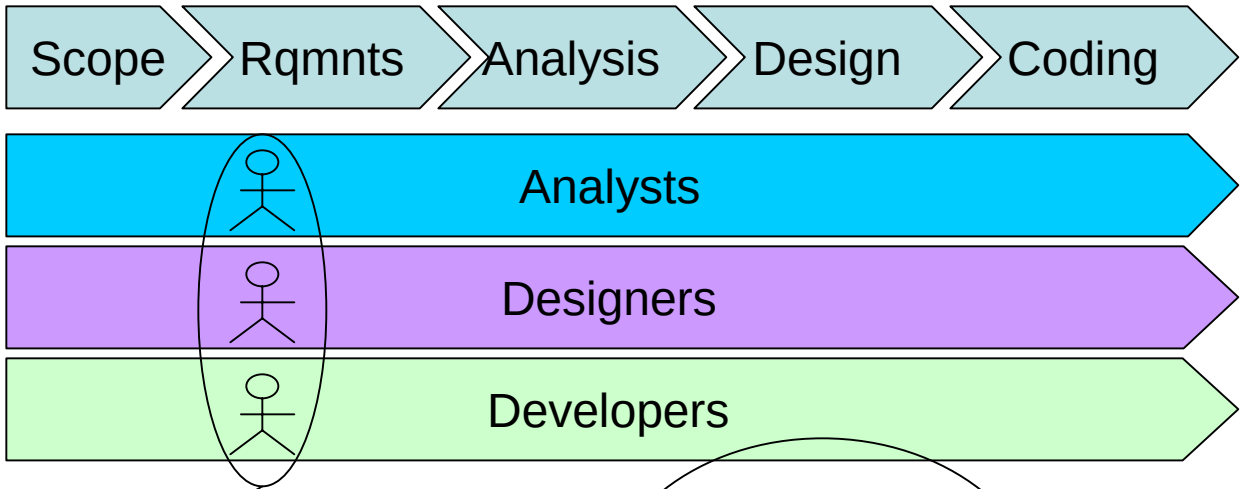
Why Are We In This Situation?

- Scope, High-Level requirements not well defined at start of project
- Business processes not clearly documented
- Project scope can be too large to manage effectively
- Project processes and artifacts are inconsistent across teams
- Often pressured to deliver too much functionality in too short a timeframe
  - Typically rush to design / coding before analysis is complete
- Haven’t always designed or built for reuse
- Lack a holistic architecture strategy
  - Vendor-driven solutions
  - Technology-driven solutions

Why Are We In This Situation?

- Duplicate Functionality exists
  - Buy/build same functionality many times
  - Maintenance cost increases by multiples
- Duplicate Data exists
  - Operational data must be synchronized
  - Results in poor data integrity, inconsistency and reporting
- Complex Architecture
  - Incomprehensible transaction flow
  - Difficult and costly to maintain or enhance
  - Complicated release management
  - Complicated regression testing

EXAMPLE - Project Team involvement



Large Project Teams –

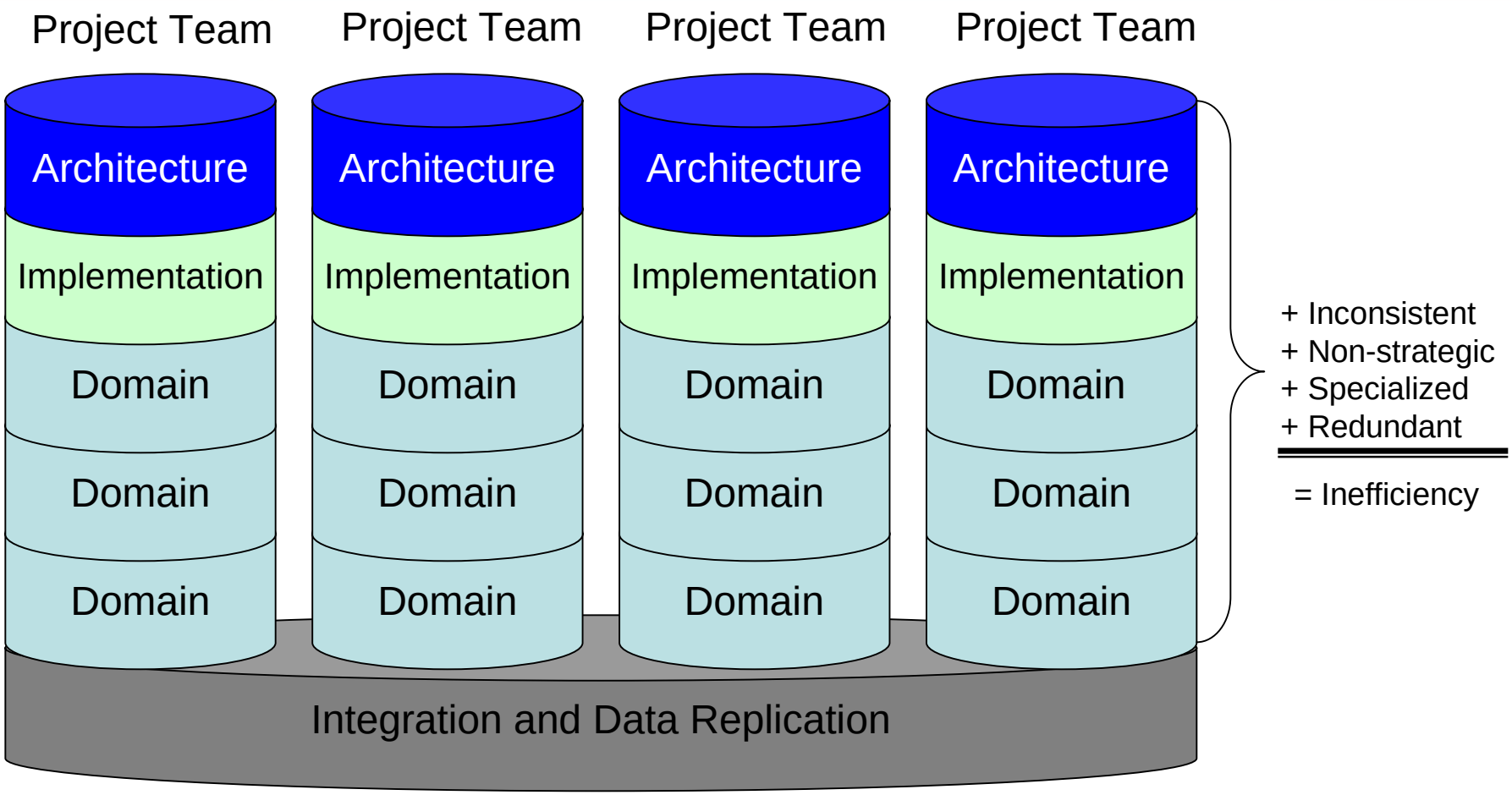
(Resources assigned too soon)

- Requirements
- Use Cases
- Detailed Design
- Code

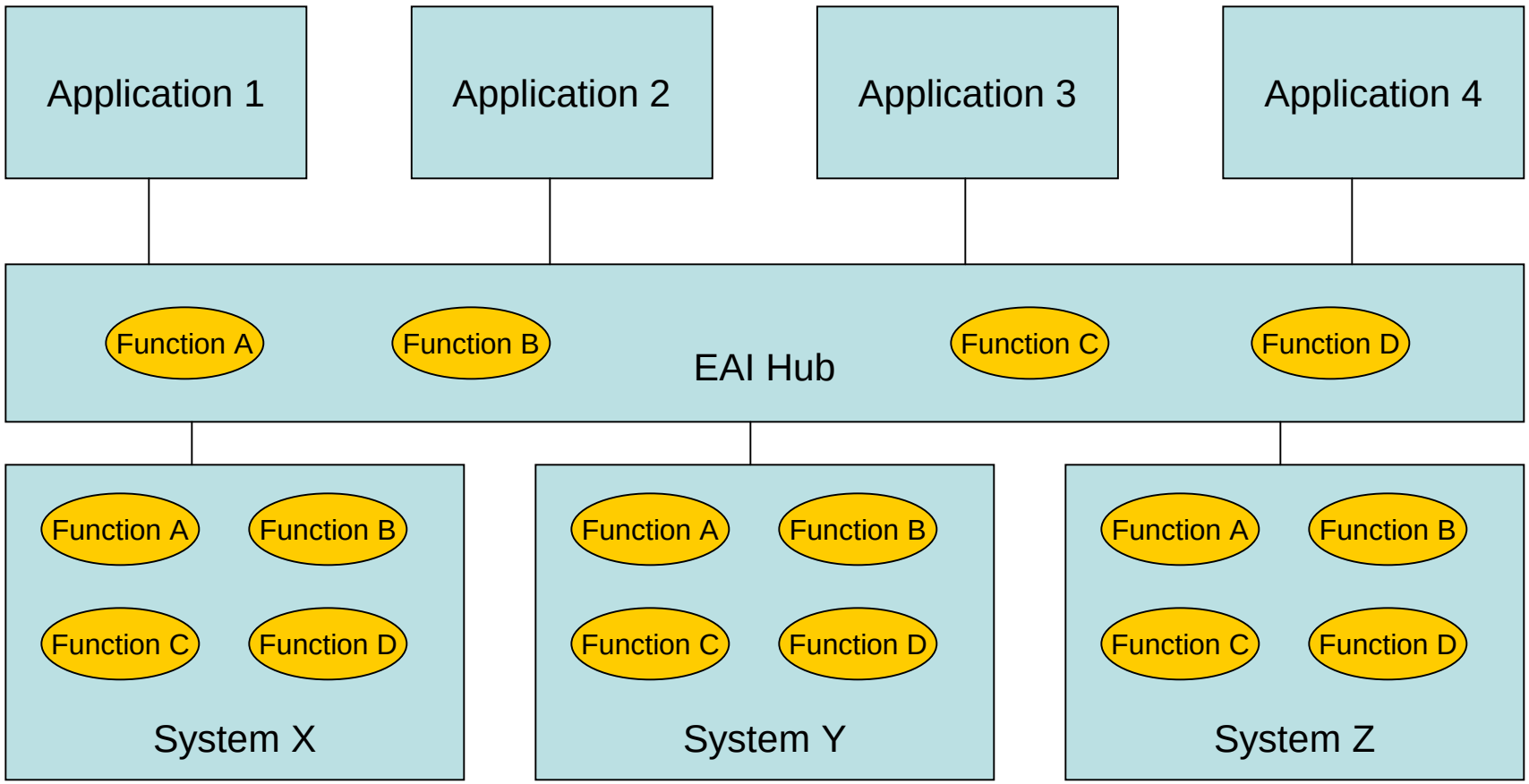
Occurring throughout Project Lifecycle

(Causes re-work, minimal reuse, Change Requests)

EXAMPLE – Project Silos



EXAMPLE – Integration / Duplicate Functionality



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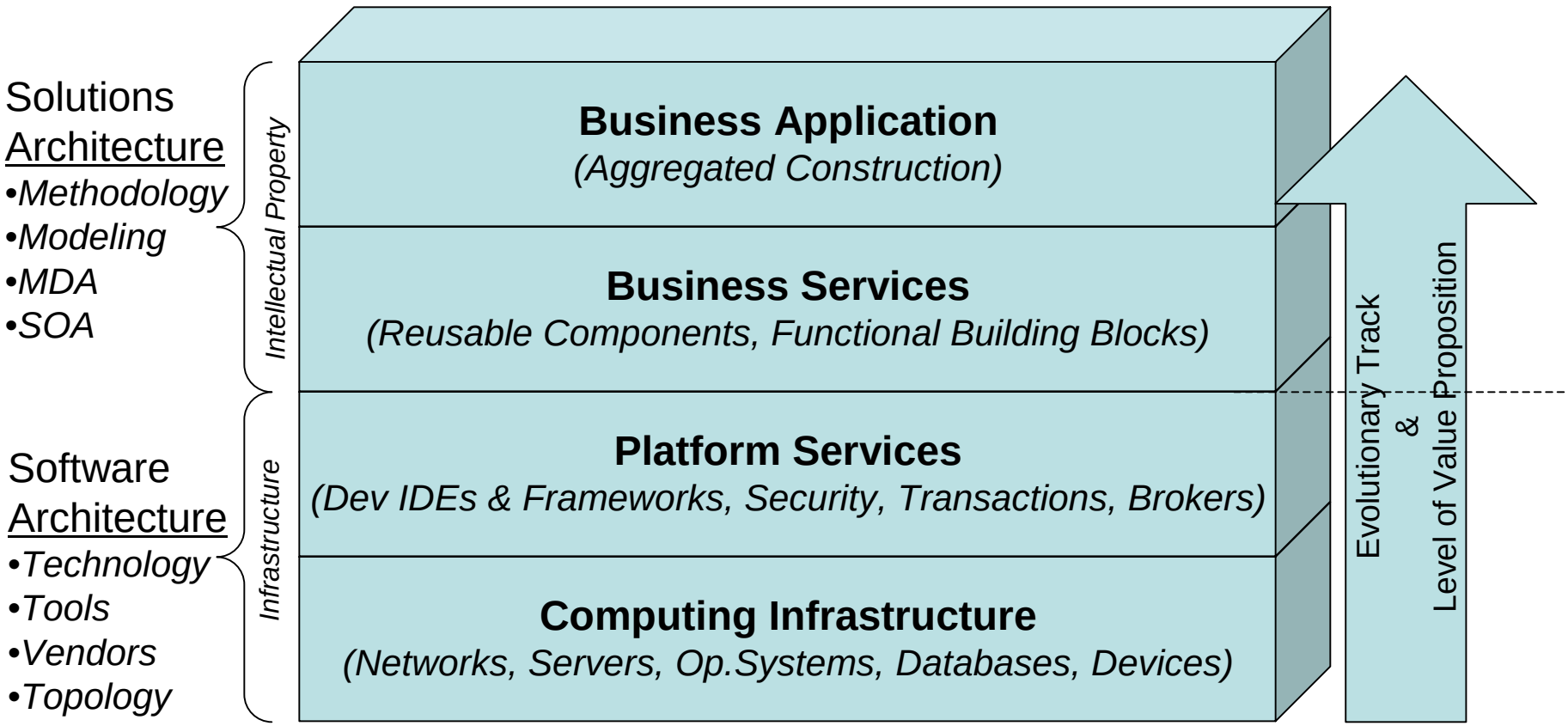
A Strategy to Achieve the IT Vision

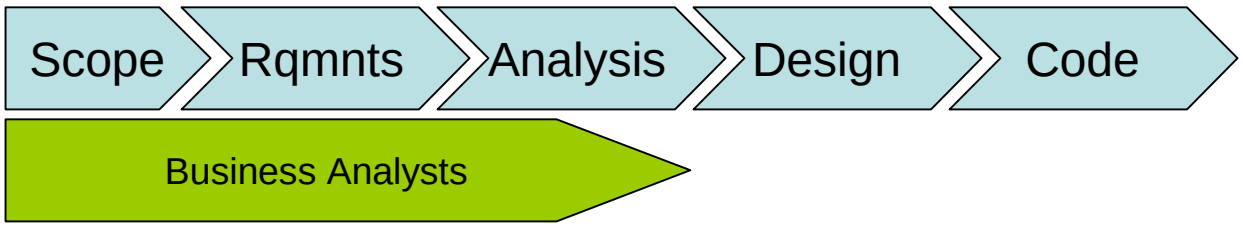
Follow These Best Practices

- Capture business process early to understand the business
- Use a disciplined MDA approach
  - Separate analysis from design
  - Streamline delivery through design & code automation
  - Standardize on our processes and notations
- Adopt SOA principles
  - Design for reuse
  - Decouple systems
  - Don’t duplicate data
  - Specify well-defined interfaces

Value Prop


Solutions Architecture
•Methodology
•Modeling
•MDA
•SOA
Software Architecture
•Technology
•Tools
•Vendors
•Topology
Intellectual Property
Infrastructure
Business Application
(Aggregated Construction)
Business Services
(Reusable Components, Functional Building Blocks)
Platform Services
(Dev IDEs & Frameworks, Security, Transactions, Brokers)
Computing Infrastructure
(Networks, Servers, Op.Systems, Databases, Devices)
Evolutionary Track
&
Level of Value Proposition

Streamlined Project Life Cycle Methodology



Business Analysts

Solutions Architecture

- Requirements
- Use Cases
- Analysis Model (PIM)
- Test Cases

Software Architecture

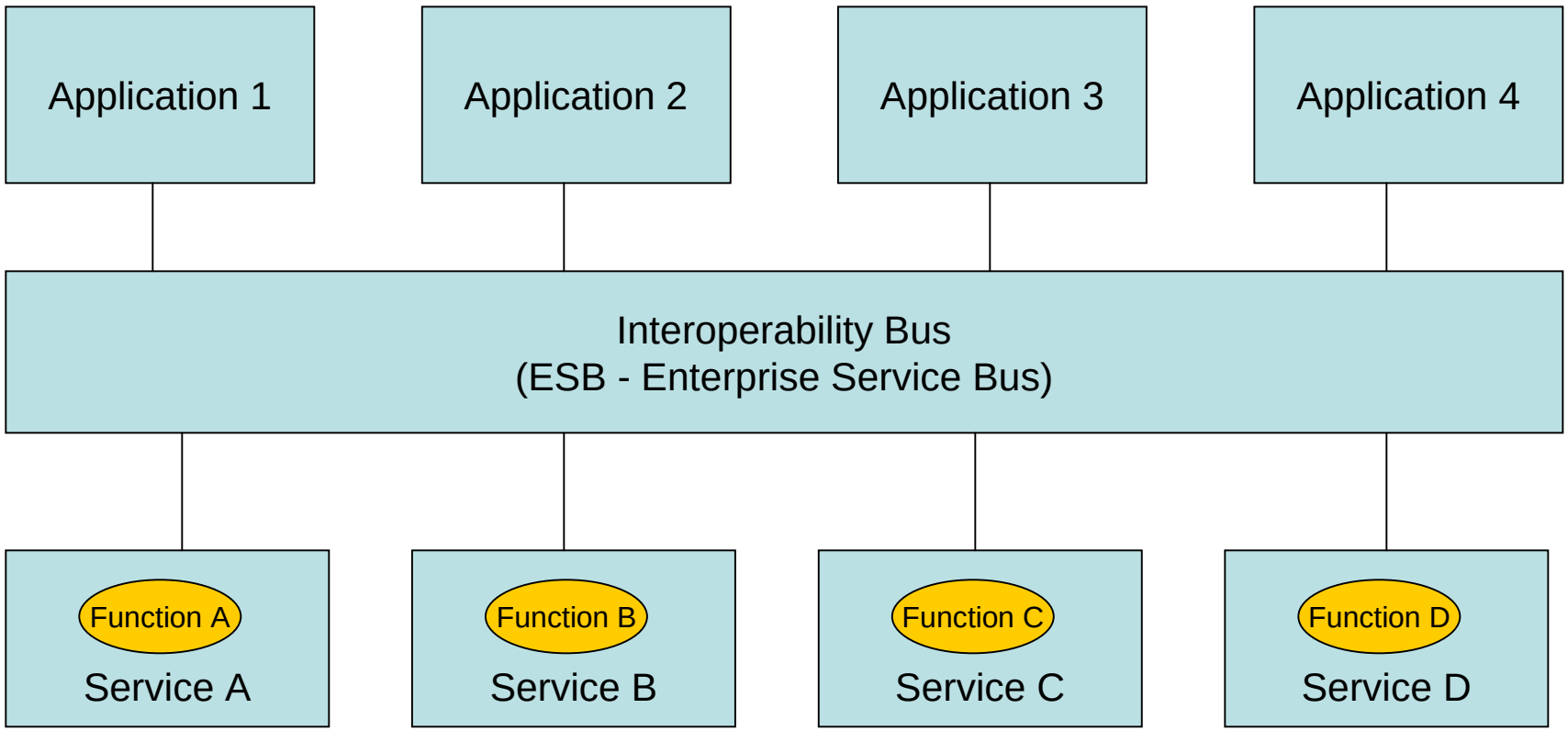
- Design Guide
- Frameworks
- Detailed Design (PSM)

Developers

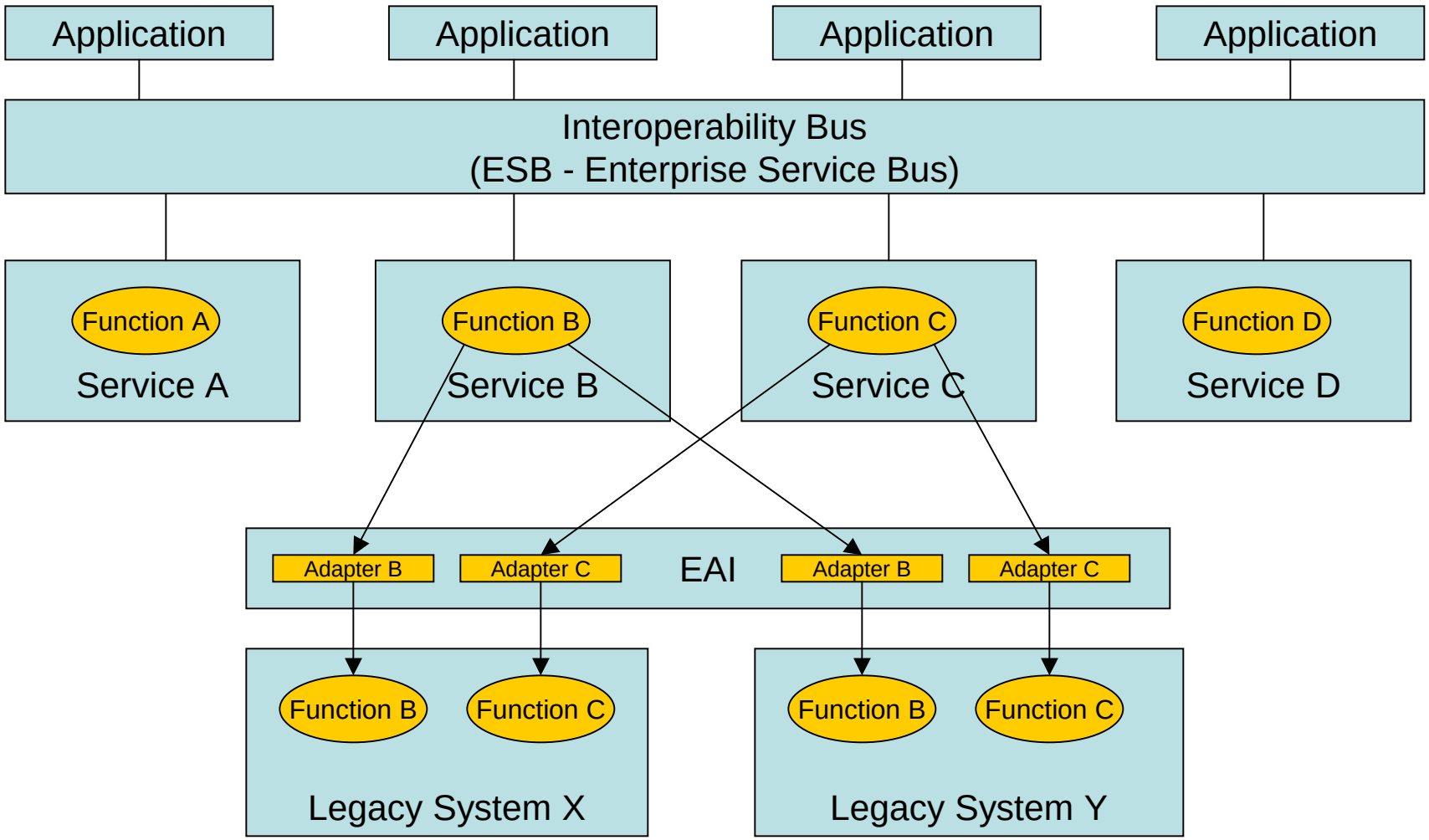
- Code

- Concerns separated into areas of competence
  - Simplified solution definition
  - Simplified technical design
- Staggered activities
  - Smaller teams
  - Faster delivery

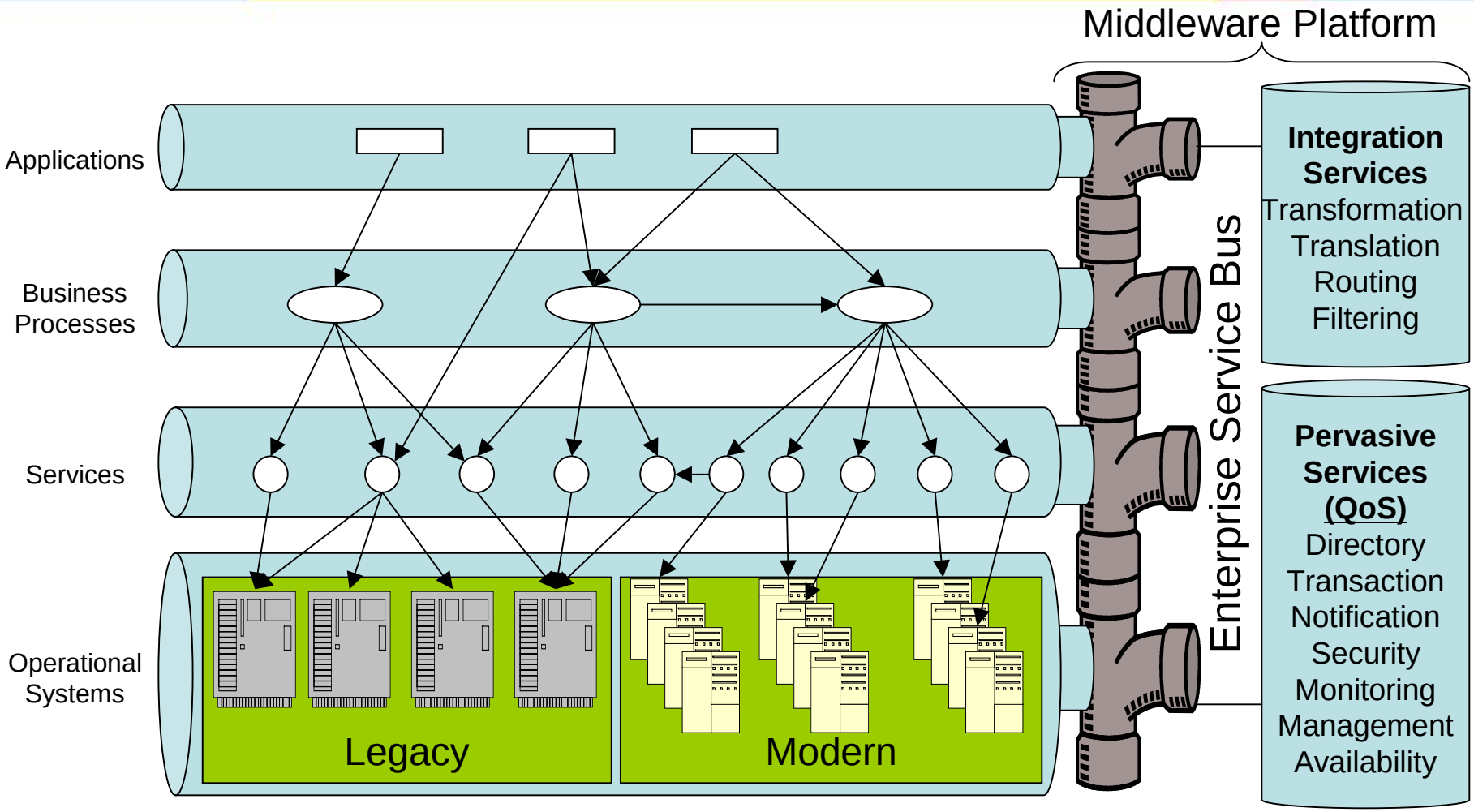
Service Oriented Architecture
(Target)



Service-Oriented Integration
(Reality)



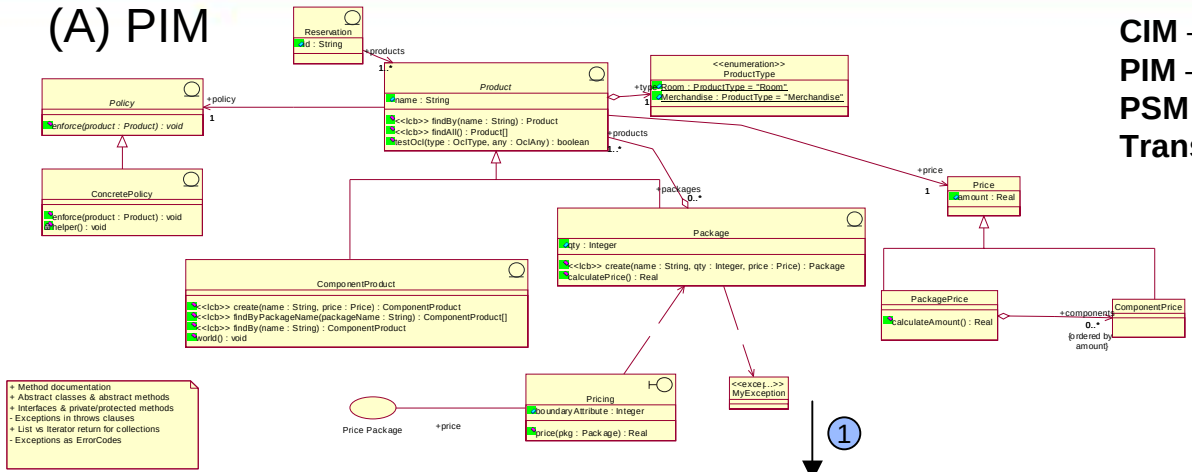
Service-Oriented Architecture (ESB functions)



Model Driven Architecture (Target)

CIM –Computational Independent Model
PIM – Platform Independent Model
PSM – Platform Specific Model
Transforms – Model-to-Model-to-Code

(A) PIM

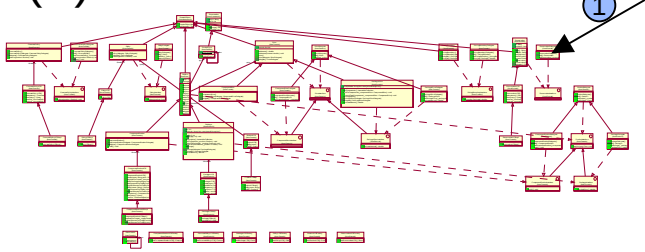


1 PIM-to-PSM Transformation

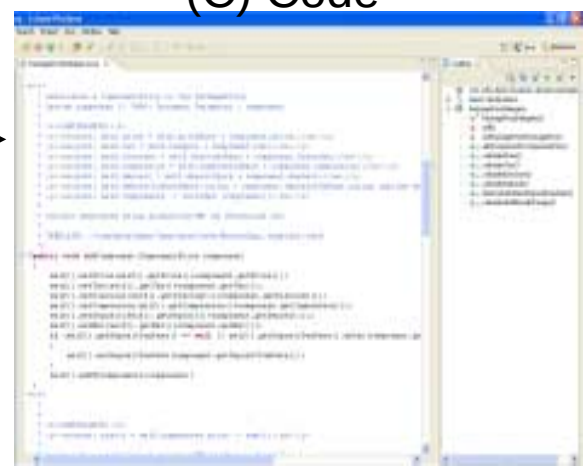
2 PSM-to-Code Transformation

(MDA Tools)

(B) PSM



(C) Code



The Value of Models
Blueprints for Business and IT

- A standards based (UML), common language for IT to communicate effectively
- Capture and grows valuable intellectual capital
  - Improves management of IT knowledge about the business
- Create efficiency in analysis and solution delivery
  - Informs our decisions with less effort, cost, and time
- Simplify solution definition
  - Technical details are separated from the core functionality
- Improve system quality, agility, and flexibility
  - To better support evolving business needs

SOA Benefits

- Reuse of Functionality
  - Buy/build functionality once
  - Maintenance cost is reduced
- Duplicate Data
  - No synchronization of data
    - No extra code, reports, or manual processes
  - High data integrity
- Naturally Simplified Architecture
  - Well-defined transactions
  - Easier to maintain or enhance
  - Release management is simplified
  - Regression testing is simplified

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The System & Project

- The Project
  - 2+ year duration
  - Heavy consultant labor
  - 5 development teams organized by function

- Reservation System replacement (called “Campus”)
  - Property Management Sync Engine
  - Service Components
    - Booking
    - Billing Folio Management
    - Groups/Conventions
    - Product Pricing (called “Pricing”) 

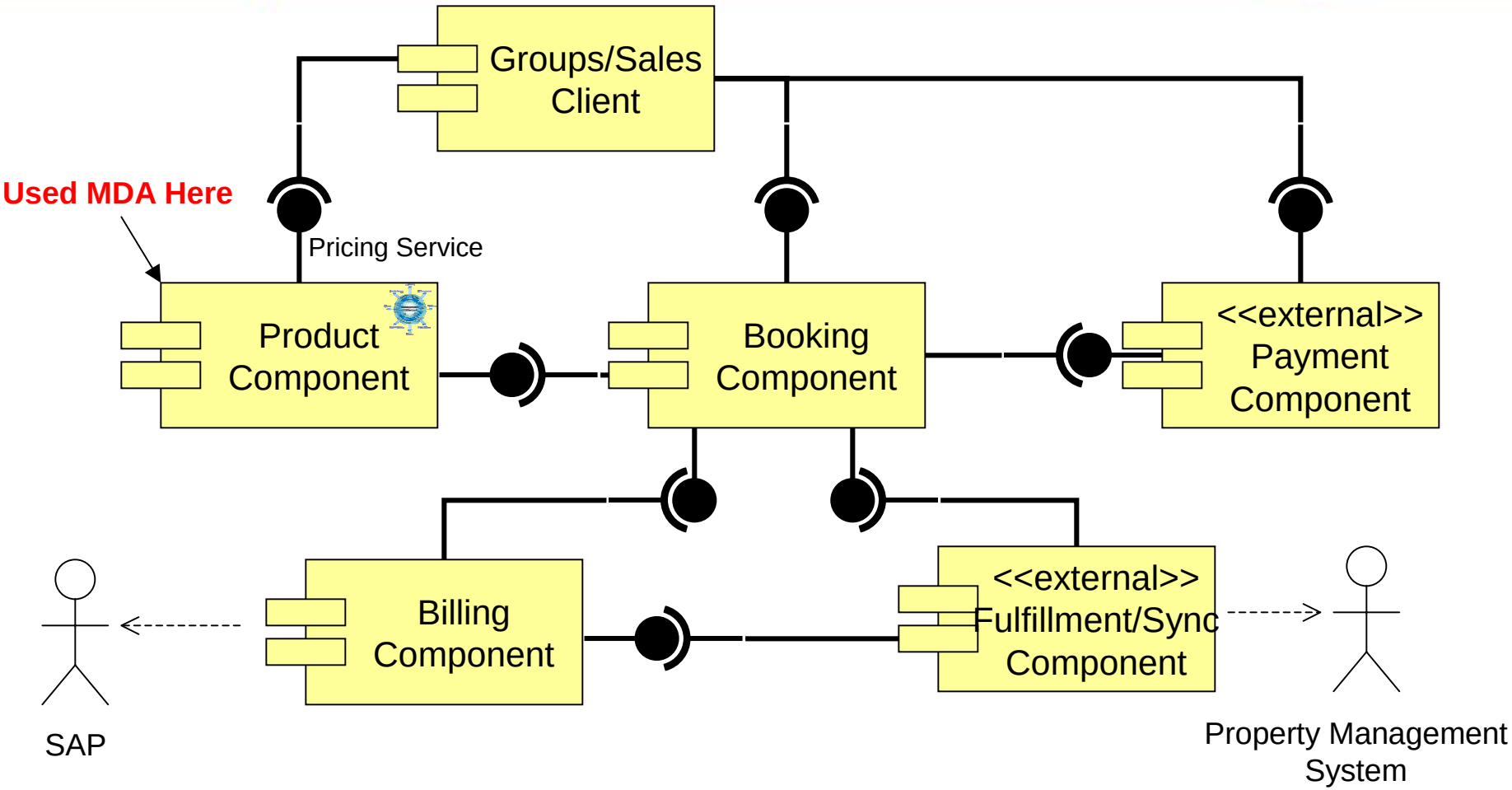
The Experiment

- Use MDA to develop the Product/Pricing service component, but use the traditional approach for all the other service components

- Gather data to quantify the value of MDA
  - Cost & Labor
  - Quantity (Code Output)
  - Quality (Defects)

- Metrics were gathered during Design, Development and Integration/QA Testing

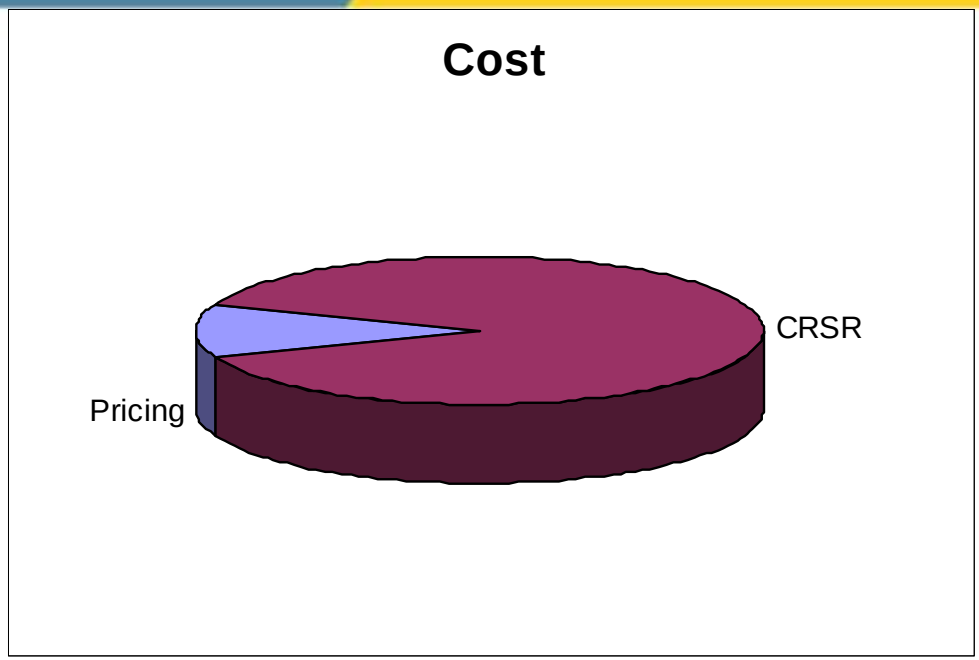
The Proof of Concept



Comparison of Approaches

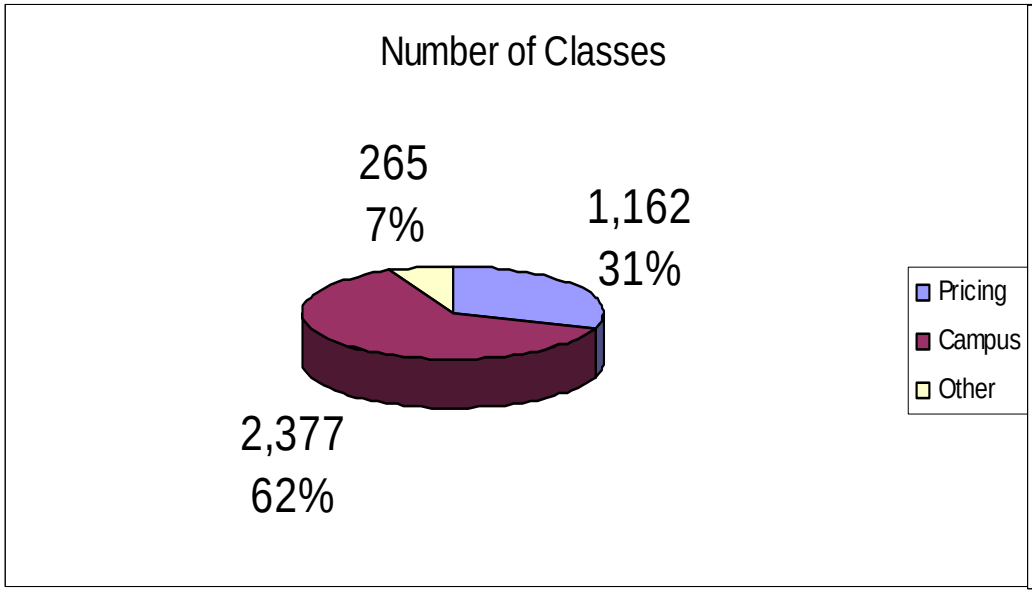
	Traditional Approach *(Booking, Billing, Groups, Sync)*	MDA Approach *(Pricing)*
The People	• Substantial staff augmentation • Large teams	• No augmentation • Small team (4)
The Tools	• Modeling, Excel, PPT, Visio • 100% hand coded (structure and business logic)	• 100% Modeling • Partial code generated (using an MDA tool) • Business logic hand-coded
The Process	• Project Management focus • Ad-hoc • Ambiguous responsibilities • Code driven	• Engineering focus • Rigorous/Repeatible • Clear responsibilities • Model driven / OCL

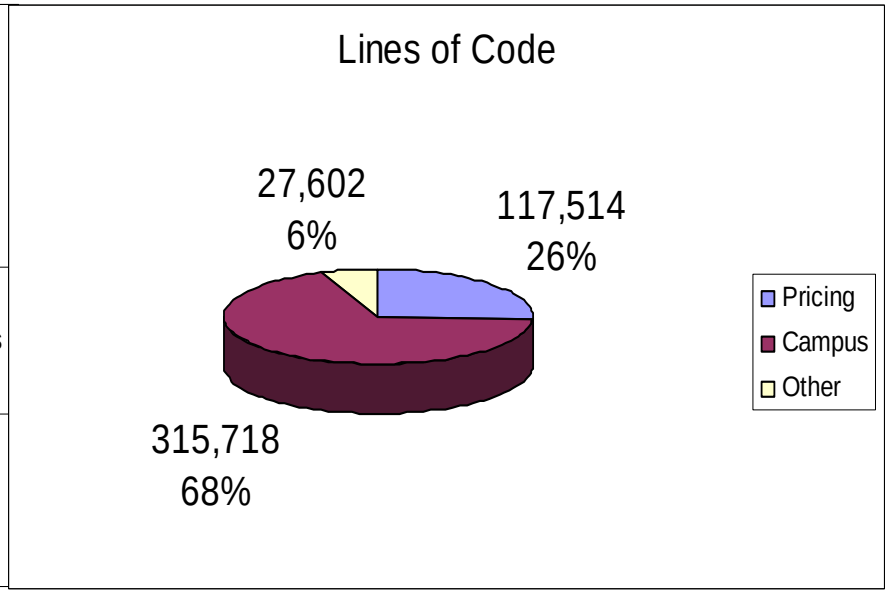
Cost/Labor Comparison



- Pricing was **12%** of the total cost
- Pricing was **13%** of the total labor hours

Code Comparison





- Pricing was **31%** of the number of classes
- Pricing had **26%** of the lines of code
- Pricing viewed as **28%** of the code base (averaging the two)

The MDA approach produced

- **28% of the code**

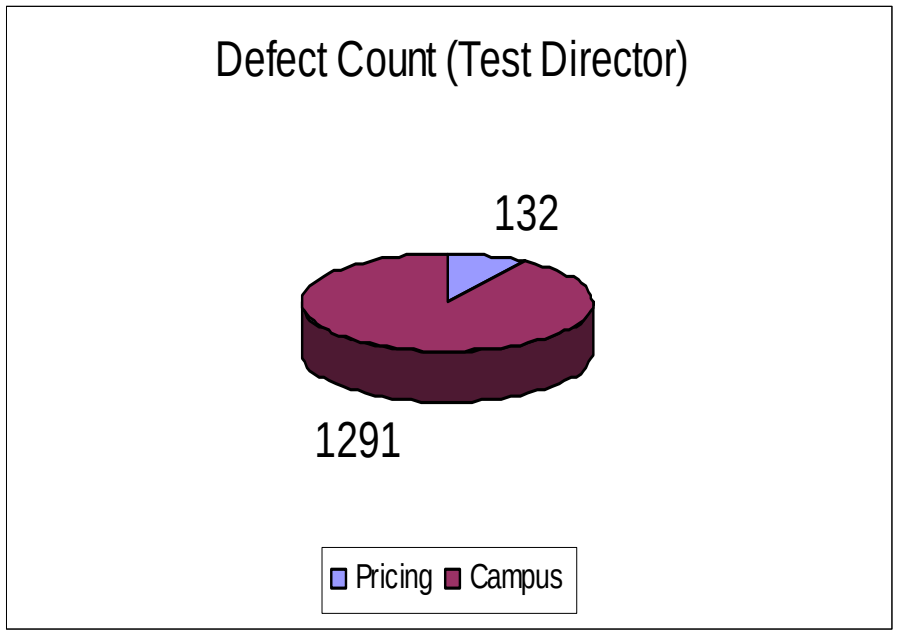
at

- **13% of the cost/labor**

compared to the traditional approach

Quality Comparison

Campus Defects
- User Interface
- Functional



Pricing Defects
- Data Seeding / Conversion
- Functional
- 50-60% was data related

based on
- Integration testing phase
- Tests performed by our QA department

Final Results

The MDA approach produced

- **28% of the code**

at

- **13% of the cost/labor**

with only

- **10% the defects**

compared to the traditional approach.

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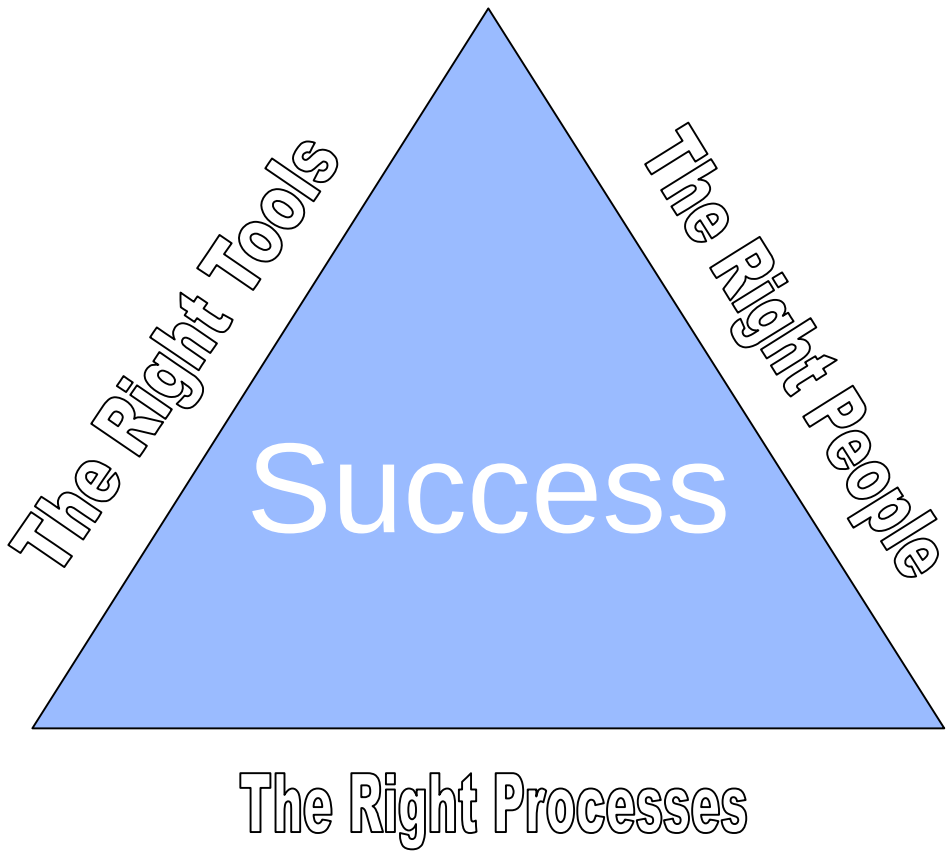
The Success Formula



Lessons learned

- Pilot some efforts
- Take a baseline, then measure progress
- Prepare a Communication Plan
  - Market the Results
  - Market the Direction
- Challenge status-quo
- State the Direction Loud and Clear
  - Leadership must hold everybody accountable to the strategy
- When starting out, Focus…
  - on something manageable, then build from there
  - on utilizing a highly-talented, small project team

Issues encountered

- Coordinating dev and test efforts with other project teams that follow different development approach's
- Models and Code getting out of sync (once testing starts)
- Testing required more coordination
- Data vs. Application Architecture
  - Does the PIM = Logical Data Model (LDM)
  - Does the PSM = Physical Data Model (PDM)

Concerns heard about SOA / MDA

- I don’t know the plan!
- Can’t we just buy SOA?
- MDA takes too long
- What’s my role going forward?
- We already have a project management methodology
- What happens if the service is down?

Reality Check

- Don’t expect to know it all before starting
  - There’s too much to learn; Experience is the best teacher
- Expect resistance
  - We fear the unknown and resist what we fear
  - Nobody likes change
- Expect to work hard to win approval
  - There are more skeptics than disciples
  - There’s a lot of vendor hype to compete with
  - You break a few eggs to make an omelet
  - You can’t make everybody happy