Lean Integration: Translating an Innovative Agile Approach into Business Value

MIS Research Center Seminar
March 25, 2011

John Schmidt
VP, Global Integration Services
Informatica
The #1 independent leader in Data Integration

- **2009 Revenue:** $500 million
- **5-year Average Growth Rate:** 18% per year
- **Customers:** 3,931
  - 84 of Fortune 100
  - 87%+ of Dow Jones
  - Government organizations in 20 countries
- **Partners:** 400+
  - Major SI, ISV, OEM and On-Demand Leaders
- **Employees:** 1,755
- **Direct in 28 Countries**
Our Singular Mission

Enabling The Information Economy

We enable organizations to reduce IT costs and gain a competitive advantage in today’s global information economy by empowering them to access, integrate and trust all their information assets.
The Role of IT in Business

“CEO’s, CFO’s and CIO’s all recognize there is zero separation between business strategy and IT execution today. There is pretty much nothing you can do, from cutting costs or growth without the enablement of IT in one way, shape or form.”

Steve Schuckenbrock,
President, Dell Large Enterprise Business

Reference: Financial Times Special Report, Wednesday, October 27, 2010
The Data Driven Enterprise

Cloud Computing

Traditional Enterprise

Partner Trading Network (B2B)

- SEPA
- NACHA
- HIPAA
Problem: Data chaos results from unnecessary complexity

Root Cause - Integrations manufactured as custom point solutions
Craftsman Approach – Custom Development

Manufacturing World
Skilled manual workers
 Manufacture by hand
 Custom products (works of art)

Integration World
Skilled IT Specialists
 Hand coding
 Custom integration points
Assembly Line Approach – This is ICCs now

Benefits
Consistent Quality
Lower Cost

Manufacturing World
Dedicated skilled labor
Standard Tools
Mass production

Integration World
Dedicated skilled labor
Standard Tools
Periodic Large Releases
Modern Factory Approach – Automated Flow of Materials and Information

Benefits
Low cost AND high quality
Exactly the way you want it

Flow of Materials
Flow of Information

Manufacturing World
Automation – new roles
JIT Workflow
Mass-Customization

Integration World
Template-driven self-service solutions
Agile/iterative Development
Configurable re-useable objects
It is Critical That You Have an Expert and Sustainable Integration Capability

Efficiency Spectrum

Integration Technology
- Hand coding
- Integration Tools (EAI,...)
- Integration Platform
- Integration Factory Platform

Management Practices
- Projects & Ad hoc integration
- Program Management
- Competency Center
- Lean Integration

Business Benefits
- Fast (quick & dirty)
- Improved Quality
- Cost Efficiency
- Faster, Better AND Cheaper

1990's 2000's 2010's
Point-in-time Methods Sustaining Methods
Cultural Change is easy – isn’t it?
Transform complexity and chaos to an Agile, Data-driven Enterprise

- Competitive Weapon
- Shared Resource
- Controlled cost
- Unmanaged silos

Perception of Data

Technology
- Hand coding
- Integration Tools
- Integration Platform
- Integration Factory Platform

Methodology
- Project
- Program
- Competency Center
- Lean Integration

Transformations
- Independent to Interdependent
- Tactical to Strategic
- Managed to Cultural

Complexity vs. Agility
- No Compromise
- Faster
- Better
- Cheaper
- Faster, Better, AND Cheaper

Business Empowerment AND IT Control
Standardization AND Innovation
Analyst Perspective

“Taking a production line approach to integrations makes a lot of sense…they should be more widely considered and implemented.”

Philip Howard, Research Director - Data Management
Bloor Research, January 7, 2009
Lean Integration Principles

- Eliminate Waste
- Continuous Improvement
- Automate Processes
- Empower the Team
- Plan for Change
- Optimize the Whole
- Build Quality In
1. Eliminate Waste
Example: Value Added Ratio – Before Lean

Scenario: Simple Change Request to the Data Warehouse

\[
\frac{\text{Value-Add}}{\text{Non Value-Add}} = \frac{5 \text{ hours}}{1344 \text{ hours}} = 1\% \text{ Value Added Ratio}
\]
1. Eliminate Waste

*Example: Most non-value added activities eliminated*

<table>
<thead>
<tr>
<th>Supervisor approves email requests a couple times a day</th>
<th>Some Developers doing low priority work can be interrupted by high-priority requests for average 4 hour wait time</th>
<th>No wait because the trained Developer can perform the logic: Automated checks insure standards followed</th>
<th>Wait an average of 4 hours to promote changes to QA for system integration test</th>
<th>Finally, daily releases mean an average wait for deployment of 4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Request</td>
<td>Approve &amp; Prioritize</td>
<td>Analyze &amp; Design</td>
<td>Build</td>
<td>Test</td>
</tr>
<tr>
<td>Value-Add 5 min</td>
<td>5 min</td>
<td>2 hours</td>
<td>1 hour</td>
<td>1 hour</td>
</tr>
<tr>
<td>Non Value-Add</td>
<td>4 hours</td>
<td>8 hours</td>
<td>0 weeks</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50 min</td>
</tr>
</tbody>
</table>

**Lead Time Reduced from 2 months to <1.5 days**

\[
\text{Lead Time Reduction} = \frac{\text{Original Lead Time} - \text{Current Lead Time}}{\text{Original Lead Time}} = \frac{1344 - 32}{1344} = 97\%
\]
1. Eliminate Waste

*Keeping data in production that no-one uses is waste*

Data that is not used still costs a lot:
- Disk capacity (production, test, DW)
- Backup costs (tapes, labor, storage)
- Business slow-down by end-of-period jobs
- Application upgrade costs
- Impact on real-time transactions
- Compliance costs
- Data quality analysis and resolution time

Archiving reduces datafile size (GB)

<table>
<thead>
<tr>
<th></th>
<th>Without archiving</th>
<th>With archiving</th>
<th>...and truncating temp tables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>1,200</td>
<td>1,400</td>
<td>1,600</td>
</tr>
<tr>
<td><strong>Year 1</strong></td>
<td>1,000</td>
<td>1,200</td>
<td>1,400</td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td>800</td>
<td>1,000</td>
<td>1,200</td>
</tr>
<tr>
<td><strong>Year 3</strong></td>
<td>600</td>
<td>800</td>
<td>1,000</td>
</tr>
</tbody>
</table>

**Projected savings by eliminating data waste**

<table>
<thead>
<tr>
<th>Year</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$1,603,277</td>
</tr>
<tr>
<td>Year 2</td>
<td>$4,925,769</td>
</tr>
<tr>
<td>Year 3</td>
<td>$6,378,391</td>
</tr>
<tr>
<td>3-year Total</td>
<td>$12,907,437</td>
</tr>
</tbody>
</table>
Take Away: Eliminating Waste is not about cutting out fat

“Don’t think of lean as requiring a diet to lose weight; think of it as focusing the people, process, technology, and architecture that you possess on the projects that have the most impact for the business.”

Mike Gualtieri, John Rymer, Jeffrey Hammond, Top Five Changes For Application Development Forrester, January 4, 2010
2. Automate Process
Create assembly lines for rapid customization

IT Designs Templates and Patterns – Users create custom solutions fast

- Generating custom wizards for templates to maximize productivity for end users – developers and/or analysts
- Ability to build your own wizards based on patterns without coding
- Common data integration and event processing patterns

1. Understand and Define Common Patterns
2. Design Template
3. End Users Quickly Configure and Customize in Assembly Line-Fashion

Examples:
- Slowly changing dimension in warehousing
- Data file interchange with supply chain partners
- Time-based event correlation

Example: Slowly Changing Dimension Wizard

Huge Productivity Gains for End Users
Take Away: Automation is a key to simplification

“Factory IT couples lean management techniques and process improvements with advances in cloud computing and software development to simplify the operating environment and improve productivity and cost performance.”

Reshaping IT management for turbulent times, Roger Roberts, Hugo Sarrazin, Johnson Sikes, McKinsey Quarterly, November, 2010
3. Empower the Team

**Problem:** IT is the bottleneck for data requests

**Solution:** Give the business self-service capabilities

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Business Self-Service

- Enables business self-service, improving business agility
- IT maintains governance and oversight

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**Business Self-Service**

- Supports IT personnel

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**Informatica**

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Take Away: Self-service improves business agility AND gives IT better governance

“Lean is about ensuring IT is more closely aligned to the Business.”

Stephen Pritchard, Financial Times

Source: Financial Times Special Report, Wednesday, October 27, 2010
4. Continuously Improve

Problem: How can groups improve themselves?
Solution: Use visual management of the entire integration lifecycle.
Take Away: Don’t use Lean to cut staff

“Best-practice executives view lean as a performance improvement strategy rather than merely a cost-cutting exercise.”

Alexander Peters, Forrester Research

Source: Financial Times Special Report, Wednesday, October 27, 2010
5. Build Quality In

**Problem:** Quality issues accumulate without business involvement

**Solution:** Involve business in fixing highest priority issues

<table>
<thead>
<tr>
<th>Name</th>
<th>Score</th>
<th>% Valid Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>CustomerUn_Valid</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>StateCd_Valid</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>ZipCd_Accuracy</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

- Line of business manager
- Data Steward
- IT Developer
Take Away: Metadata is an enabler for IT automation

“Metadata allow systems to adapt more quickly to changing requirements by pushing power into the data, and out onto users.”

Brian Foote and Joseph Yoder, Big Ball of Mud, Addison-Wesley Software Patterns Series, 2000

Reference: Financial Times Special Report, Wednesday, October 27, 2010
6. Plan for Change

Insulate consuming applications from change
Lean Integration

Proven Value Proposition: Better, Cheaper & Faster

- Focus on Customer Value and Eliminate Waste
- Automate Processes
- Empower the Team
- Plan For Change
- Continuously Improve
- Build Quality In
- Optimize The Whole

**Database Archiving**
- 4 month payback from storage reduction, and rapid retrieval of archived claims for improved customer service

**Mapping Architect For Visio**
- After re-working their ETL processes to always use design patterns, achieved 8x efficiencies on all new projects and re-work on old projects

**Cloud Services**
- Business analysts use Informatica Cloud Services to self-serve data for their own analysis, cutting lead-times to information by 90%

**V9 Data Services**
- Centrally managed virtual views speed up time to add products to DW portfolio from 1700 hours to 40 hours

**PCAE - Metadata Manager**
- Reduced impact analysis time between 85-95%, reduced time for business analyst inquiries by 50%, reduced end-user support time by over 65%

**Data Quality**
- Saved $1.4M in first 6 months because of improved customer master data quality; Reduced SKU’s by 40% by reducing old or obsolete parts

**The Informatica Platform**
- Implemented data quality metrics and monitoring system; Saved est.$3M in development costs and avoided $20M in AML regulatory fines
Manufacturing Production Lines

Bread factory

Bottling Line

Car Assembly Line
Leading Practice: Integration Systems are Managed Like First-Class Business Systems
Informatica Platform Mapping

Integration Systems

Integration Hub
- Data Warehouse
- Business Analytics
- Master Data Management
- Data Quality

Transformation Hub
- Extract Transform Load
- Managed File Transfer
- Business to Business

Application Integration
- Cloud Services
- Enterprise Service Bus
- Information Security
- Enterprise Messaging

Portal
- Information Portal
- Directory & Single Sign-on
- Content Management
- Search

Integration Repository
- Metadata Manager
- Business Glossary
- Service Registry
- Data Stewardship

Process Management
- Process State Engine
- Activity Monitoring
- Workflow
- Complex Event Processing

Ultra Messaging
- CEP
- B2B Data Exchange
- Cloud Services
- ILM
- PowerCenter
- Data Quality
- MDM
Informatica Factory Platform

*Products in Eight Growth Categories*

- **Data Loader**
- **Data Replication**
- **Data Synchronization**
- **Data Quality Assessment**
- **Data Quality Global Address Verification**
- **Informatica Cloud Platform**
- **Data Quality**
- **PowerCenter**

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- **Ultra Messaging**
- **Complex Event Processing**
- **B2B Data Exchange**
- **Enterprise Data Integration**
- **Application ILM**
- **Data Quality**
- **Master Data Management**

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- **LBIM Streaming**
- **RulePoint**
- **Advanced XML**
- **PowerExchange**
- **Data Archive**
- **Identity Resolution**
- **MDM**

- **UME Persistence**
- **RuleCast**
- **Data Transformation**
- **PowerCenter**
- **Data Subset**
- **Data Quality**

- **UME Queueing**
- **Real-Time Alert Manager**
- **Data Exchange**
- **Data Services**
- **Data Privacy**
- **Data Explorer**
Production Line for Application Modernization

Data Loader → Data Replication → Data Synchronization → Data Quality Assessment → Data Quality Global Address Verification

Informatica Cloud Platform

Knowledge Management

Data Quality

PowerCenter

MDM

Ultra Messaging

Complex Event Processing

B2B Data Exchange

Enterprise Data Integration

Application ILM

Data Quality

Master Data Management

LBM Streaming

RulePoint

Advanced XML

PowerExchange

Data Archive

Identity Resolution

RuleCast

Data Transformation

PowerCenter

Data Subset

Data Quality

Real-Time Alert Manager

Data Exchange

Data Services

Data Privacy

Data Explorer
Production Line for Supply Chain Integration
Production Line for Business Intelligence COE

- Data Loader
- Data Replication
- Data Synchronization
- Data Quality Assessment
- Data Quality Global Address Verification
- Informatica Cloud Platform
- Data Quality
- Master Data Management

- Ultra Messaging
- Complex Event Processing
- B2B Data Exchange
- Enterprise Data Integration
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- Data Privacy
- RuleCast
- PowerCenter
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- Data Archive
- Identity Resolution
- MDM
- PowerExchange
- Data Services
- Data Explorer
- Advanced XML
- Data Transformation
- Real-Time Alert Manager
- Data Exchange
- LBM Streaming
- RulePoint
- UME Persistence
- UME Queueing

Informatica
Good technology alone does not guarantee success

“Deploying technology, by itself, is a poor strategy for improving the implementation of interfaces. An effective strategy for integration is established by using these critical success factors:

- Establish an ICC.
- Develop an integration "city plan" consisting of:
  - Policies that implement the necessary governance
  - A set of best practices that is continually refined by measuring the result of applying the best practices in integration projects
  - A technology architecture that establishes standards for the technologies to be used during application integration
  - Have integration competency staff drive the selection of the integration technologies that are to be deployed.

The Seven Critical Success Factors for Application Integration,
Jess Thompson, Gartner, November 10, 2010
Lean methods in a nutshell
Lean methods – a more complete list

Business Strategy and Annual Plan Goals

Hoshin Kanri – True North – Catch ball – A3 – PDCA Review

- Service
- Inventory
- DPPM

- Labor productivity
- Yield
- OEE

- Safety incident rate
- Value stream cycle time
- % Value Added Time

Standardized work for every team member

Roles & processes

- 5S
- TPM
- Kanban
- Supermarkets
- Change over wheel
- Pace maker scheduling
- Material delivery routes
- Source quality
- TaktTime
- Work cell design
- Standard work
- Error proofing
- Plant flow layout
- Level loading: Heijunka
- Jidoka
- SMED

Metrics

System Assessment

- Value Stream Mapping
- Go See

Purpose:
Increase customer value by optimizing value stream resources forever

- Labor
- Space
- Materials
- Equipment
- Inventory

Problem solving

Improvement opportunities

- Kaizen events
- PDCA
- Six Sigma DMAIC
- Lean practices & methods
- TOC improvement method

Monitoring & control

- Hourly production charts
- Manager daily shop floor time
- Layered audits
- Visual management

Value Stream View

Principles

- Customer Value
- Shop floor associates add value
- Value Stream System

- Seven Waste Reduction
- Single Piece Flow & Pull
- Auto-adaptation

- Teamwork
- Go See
- Standard Work

- Process Stability
- Visual Management
- Kaizen and Perfection

INFORMATICA
DOIT Corporation: Value Stream Map (AS-IS) for Change Request Process
Monday, December 20, 2010

1. **CR Review Committee**
   - Semi-Weekly Review
   - Bypass Council for simple CR’s (26 days)

2. **Design Approval**
   - Architecture Review Council
   - Design Document
   - Approved Designs

3. **Test Scheduling**
   - Test Team Manager
   - Test Results
   - Distribution

4. **Test Execution**
   - Test Team
   - Test Case
   - Development

5. **Production Deployment**
   - Infrastructure Team
   - Production Execution

6. **Production CR**
   - Data Warehouse Team
   - CR Approval

7. **Data Dictionary**
   - to clarify rqmnts (13 days)

8. **Automated Workflow/Tracking**
   - Cust satisfaction

9. **Status Update**
   - Status Request

10. **Not to Customer**
    - (Cust Satisfaction) (5 days)

11. **Weekly Review**
    - 30 Minutes
    - 8.8 Days

12. **Requirements Review**
    - Development Team
    - CR’s P1x12 P2x35 P3x124

13. **Design & Development**
    - Development Team
    - 180 Minutes
    - 15 Minutes

14. **Test Case Development**
    - Test Team
    - Development
    - 180 Minutes
    - 90 Minutes

15. **Test Execution**
    - Test Team
    - 8.5 Days
    - 15 Minutes

16. **Production Execution**
    - Automatic Daily ETL Batch Run
    - Lead Time = 79.6 Days
    - Work Time = 510 Minutes (8.5 hrs or 0.35 Days)

17. **Value Ratio:** Work Time / Lead Time = 0.5%

Notes:
1. Lead Time includes 5 delay in customer notification
2. Lead Time could be reduced to 24 days with just process changes and using existing tools
3. Lead Time could be reduced to 3 days with a capital investment for automated testing
Integration Factory Organizational Structure
Helpful resources: Best practice references
Available at amazon.com or integrationfactory.com

- **Integration Competency Center (2005):** A permanent cross-functional team operating as a shared service function supporting multiple organizational units and sustaining integration in a coordinated manner.

- **Lean Integration (2010):** A teachable, sustainable management system that emphasizes creating value for customers, continuous improvement, and eliminating waste as a sustainable data management and integration practice.
Lean Integration

From Wikipedia, the free encyclopedia

Lean Integration is a management system that emphasizes creating value for customers, continuous improvement, and eliminating waste as a sustainable data integration and system integration practice. Lean Integration has parallels with other lean disciplines such as Lean Manufacturing, Lean IT, and Lean software development. It is a specialized collection of tools and techniques that address the unique challenges associated with seamlessly combining information and processes from systems that were independently developed, are based on incompatible data models, and remain independently managed, to achieve a cohesive holistic operation.

Contents

1 History
2 Overview
3 Lean Integration Principles
4 Benefits of Lean Integration
5 References:
6 See Also:
7 External Links:

History


Overview

Lean Integration builds on the same set of principles that were developed for Lean Manufacturing and Lean software development which is based on the Toyota Production System. Integration solutions can be broadly categorized as either Process Integration or Data Integration.
Lean Integration

An Integration Factory Approach to Business Agility

By John G. Schmidt and David Lyle

Billing itself as a system for implementing commonsense ideas, this book aims to resolve setbacks that arise when you tackle integration one project at a time. By taking a holistic approach, it promises, you can reduce inefficiencies and waste, create a system for continuous improvement, and do a lot more with less. The authors illustrate their argument with case studies and detailed charts and graphs.

Addison-Wesley, $39.99
Sharing Knowledge Among Users

**INFORMATICA MARKETPLACE**

The go-to destination to buy and sell proven data integration, data quality, and data management solutions (Blocks).

**Get promoted!** Reduce your time to market with pre-built solutions

**Get ahead of the competition!** Increase your sales reach with Informatica Marketplace

Maximize your Informatica investment with Informatica Marketplace - [www.informaticamarketplace.com](http://www.informaticamarketplace.com)
Integration Maturity Assessment Survey

Lean Integration Maturity Assessment Diagnostic

An Informatica Assessment Tool

This Lean Integration Maturity Assessment Diagnostic was developed by Informatica based on the book Lean Integration: An Integration Factory Approach to Business Agility. Its purpose is to provide individuals with a way to assess their organization's competency in seven categories and to compare their relative maturity to each other and to the average of all survey respondents. The tool uses a series of "acid test" questions that provide a rough indication of the practices that the organization has adopted.

Most people complete the survey in less than 30 minutes. If you are interrupted, you may return to this site and continue where you left off. At the completion of the survey, you will be presented with a graphical representation of your score in comparison to others and a summary report which you may print or download and forward.

For more information about Lean Integration, visit www.integrationfactory.com. To learn more about how Informatica products and services can help your organization enhance its integration capabilities, please visit http://www.informatica.com/solutions/lean_integration.

http://vip.informatica.com/?elqPURLPage=7960
## Impact: IT Costs are Increasing

### Integration Opportunity Calculator

<table>
<thead>
<tr>
<th>Feature</th>
<th>DOIT</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Revenue</td>
<td>$1,000,000,000</td>
<td></td>
</tr>
<tr>
<td>Industry Sector</td>
<td>All industries</td>
<td></td>
</tr>
<tr>
<td>Size (Number of Employees)</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>IT Budget as a percent of revenue</td>
<td>3.0%</td>
<td>$29,973,356</td>
</tr>
<tr>
<td>% of IT budget spent on investments</td>
<td>30.3%</td>
<td>$9,088,436</td>
</tr>
<tr>
<td>% of investment projects spent on integration</td>
<td>35.0%</td>
<td>$3,180,953</td>
</tr>
<tr>
<td>% of Integration project savings resulting from an ICC</td>
<td>30.0%</td>
<td>$954,286</td>
</tr>
<tr>
<td>% of IT budget spent on MOOSE</td>
<td>69.7%</td>
<td>$20,884,920</td>
</tr>
<tr>
<td>% of MOOSE spent on maintenance (approximate - no study available)</td>
<td>15.0%</td>
<td>$3,132,738</td>
</tr>
<tr>
<td>% of integration savings on maintenance costs resulting from an ICC</td>
<td>20.0%</td>
<td>$626,548</td>
</tr>
<tr>
<td>Total potential annual savings resulting from an ICC</td>
<td></td>
<td>$1,580,833</td>
</tr>
</tbody>
</table>

### Notes:

2. Gartner, 11-6-2003, “Client Issues for Application Integration”
3. Gartner, 4-4-2008, “Cost Cutting Through the Use of an Integration Competency Center or SOA Center of Excellence”

_Moose = Maintain and Operate the IT Organization, Systems, and Equipment_
Takeaways

- Lean is Easy – don’t try to be “perfect”
- Learn a Lean technique and start using it
- Invest in Factory tools
Reference Models are an essential element of an effective Business Framework

How does a framework help?

• Faster projects
• Higher quality solutions
• Decreased cost through reuse of technology assets
• Tighter integration of business and IT – more flexible and agile organization
• Common Business Language
• Up-to-date Risk and Compliance requirements integrated throughout
## Case Study: Wachovia’s Business Architecture

### Figure 1: Bottom-Line Results From Wachovia's Business Architecture Initiative

<table>
<thead>
<tr>
<th>Source</th>
<th>Savings</th>
<th>Additional benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexpected project cost avoided</td>
<td>$24 million</td>
<td>Projects delivered 72% to 100% of initial project scope, beating the industry average.</td>
</tr>
<tr>
<td>Comprehensive business requirements</td>
<td>$575,000</td>
<td>Up to 80% reduction in requirement change requests</td>
</tr>
<tr>
<td>Technology reuse</td>
<td>$16 million</td>
<td>28% reduction in effort to complete key project deliverables through asset reuse</td>
</tr>
</tbody>
</table>

Source: Forrester Research, Inc.
Information Architecture Framework

Layer 4 – Enterprise View
Overarching consistent context for executives & information stewards

Layer 3 - Business View
Domain models for business owners and project sponsors

Layer 2 – Solution View
Architecture models for specific systems and solutions

Layer 1 – Technology View
Technical models for developers, engineers and operations staff

A layered approach is needed to manage data complexity, provide multiple stakeholder views, and maintain traceability to business requirements.
Data Governance Methodology

Entry Points
1. **Enterprise Initiative** (Large-scale program with defined ROI – e.g. Merger or major business transformation)
2. **Top-level Directive** (C-level or higher – e.g. one view of customer/business, control IP, data security, etc.)
3. **Scale-up DQ and MDM Projects** (Leverage successful solutions that demonstrate the value for a specific business area and scale them up to cross-functional enterprise-wide initiatives)