

Integration of Software Systems

Miloš Cvetanović
 Faculty of Electrical Engineering
 University of Belgrade
 cmilos@etf.bg.ac.yu

Agenda

- Part one – Practical point of view
 - Process: Identifying and Qualifying
 - Customer Business and IT Requirements
 - Common Business Drivers
- Part two – Research point of view
 - Methodology based upon RE principles

Three-Step Process (Identifying & Qualifying Opportunities)

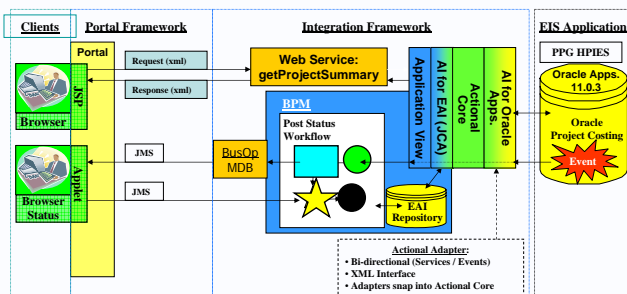
- **Step One:**
Understand business drivers and enterprise IT strategy
- **Step Two:**
Identify customers' specific requirements for integration (*look for common business challenges*)
- **Step Three:**
Position Integration as the solution based on best practices

Step One (Understand business drivers and enterprise IT strategy)

- IT Strategy Segmentation
 - “Frozen” (20%)
 - “Packaged Simplicity” (25%)
 - “Managed Heterogeneity” (45%)
 - “NextGen Architecture” (10%)
- Value of the platform
 - Lower Total Cost of IT
 - Improve IT Productivity and Responsiveness
 - Leverage Current and Future Assets

Unified Simplified
 Extensible

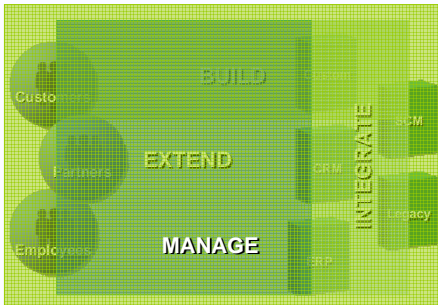
Process Driven Integration



Step Two (Understand Customer Specific Integration Requirements)

- Core business process are overly manual and expensive
- Application-to-Application connectivity exists but is “hard wired” and inflexible
- Need to aggregate and present information from multiple systems (via a portal) to partners, customers, employees
- B2B interactions are costly to maintain and extend to new partners

Types of Projects

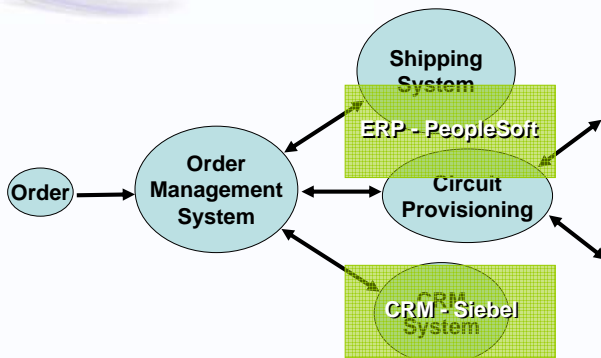


- Less Expensive
- Faster
- Leverage existing assets

Step Three (Position Integration as the solution based on best practices)

- TODO:
 - Gather Background Information
 - Identify Pain Points
 - Value Response
- Specific Projects
 - Order Management and Processing
 - Single View of Customer and Self Service
 - Business Process Improvement
 - Manufacturing
 - Insurance Claims Management

Example: Order Management



Gather Background Information

- *Goal - See the whole picture. Complexity, "hard wired" connections, manual steps lead to deals.*
 - Look for: Number of steps and apps in the process.
 - Look for: Manual steps, error and exception handling.
 - Ask: How is it all connected together?
 - Ask: How are business factors (defined below) affecting the process?
- Please describe your order management process, including all software that provides application functionality and how it all works together.
- What business factors (mergers, acquisitions, out-sourcing, layoffs, competition, legislation) have affected or will affect the way you process orders?

Identify Pain Points

- *Goal: Find problems that need fixing with technology. Some solutions may be organizational.*
 - Look for: Inefficiencies such as manual steps, re-entering, etc.
 - Look for: Inflexibility due to rigid applications or "hard wired" integration, not able to change or change quickly
 - Look for: Reliability problems, high support costs, brittleness
 - Look for: Missing functionality: self serve order management, ability to sell new products/solutions, direct access to distributors
- What are your plans for your order management process, replace some or all functionality, add capabilities, reduce manual steps, or leave as is?
- What areas are you looking to improve in your order management process? (time delays, errors, manual steps, lost orders, exceptions, cost)
- How do these problems affect your business? (high costs, customer satisfaction, loss of business, risk, limit growth, limit expansion to new markets)

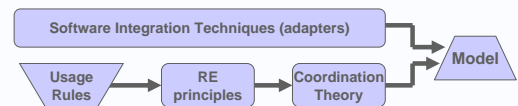
Values Response

- The key is to deliver examples of solutions succeeding in this area
 - Greatly improved order management processes
 - An ROI and payback in short period
- We would like to explore further how we can benefit you in the same way. Who would you like me to work with on your staff to begin this process?

Methodology based upon RE principles

Methodology overview

- Interdisciplinary work
 - Integration of Software Systems
 - Reverse Engineering
 - Organization Science (coordination theory)
- Recovering all mandatory dependencies among software systems that we integrate
- Mathematical Model (CSP)
 - Compatibility testing (WRIGHT)
 - Deadlock freedom
 - Simulations (FDR Tool)



Coordination Theory

- Dependencies Space
 - Usability
 - Accessibility
 - Prerequisite
 - Resource sharing
 - User sharing
- Managing dependencies with coordination processes
- Design Space
 - Design choices → Space dimensions
 - Variations in each Design choice → Values along a Space dimension
- Mapping between
 - Dependency Design Space
 - Coordination Design Space

Taxonomy

- Criteria 1 (scope of integration):
 - Inter-company Integration
 - Intra-company Integration
- Criteria 2 (type of service, market type):
 - Vertical Integration
 - Horizontal Integration
- Criteria 3 (level of integration):
 - Data Level Integration
 - Presentation Level Integration
 - Method Level Integration
- Criteria 4 (communication type):
 - Indirect Integration
 - Direct Integration

Partial cognition of software systems

- In which business processes particular software systems participate?
- Which resources are used by particular activity, and in which role?
- In which activities are access rights defined for particular resource, and in which role?
- What interdependencies exist among activities of a particular role?
- Which roles use particular activity, and when?
- How control flow reaches particular activity?
- Which activities use particular active resource, and when?

Thank you for your attention!

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