Iterative RFP Process Management

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Objectives

1. Introduce an Adaptive Team Collaborative Process (ATCP)
2. Review traditional request for proposal (RFP) process
3. Government challenges with iterative development
4. Introduce iterative RFP process management
5. Review Architectural Tradeoff Analysis Method (ATAM)
6. Describe case study at State of Wisconsin
   - Iterative process
   - Traceability strategy
   - Automation within an MDA framework
Business Benefits

1. Accelerated delivery through repeatable process
   • 6 months vs. 18 – 24 months

1. New customer-centric viewpoint
   • Drive improved customer satisfaction

1. In-house expertise
   • Reduce dependency on outside help

1. Retain organization knowledge
   • Reduce risk related to less experienced workforce

1. Impact analysis
   • Reduce risk of change

1. Reference model
   • Used in implementation stage by selected vendor
   • Used by other states as basis for other RFPs
Adaptive Team Collaboration Process SM (ATCP™)

1. Adaptive
   - Plan in increments; get small things working (iterations)
   - Work together (collaborate) to get best results
   - Build team environment in which everyone learns and can contribute effectively

1. Customer-centric
   - Deliver continual visible value to customer
   - Describe system capabilities with customer/user first, not system

1. Risk-driven
   - Something that might happen that may affect the project
   - Minimize rework risk: business/requirements change and unknown technology
   - Identify and resolve potential risks
ATCP Predecessors

1. Extreme Programming (XP)
2. Adaptive Software Development (ASD)
3. Usage-Centered Design (U-CD)
   - U-CD adopted ATCP Actor/Role concepts – Oct 2002
4. Object-Oriented Analysis and Design (OOAD)
5. Unified Modeling Language (UML)
6. Rational Unified Process (RUP)
7. Capability Maturity Model Integration (CMMI)
1. Built on industry standards to provide stable platform

Adaptive Team Collaboration Process (ATCP)


1. Ensures sustainability and longevity

1. Integrates with industry process frameworks
   - SEI Capability Maturity Model Integration (CMMI)
   - Project Management Institute (PMI)
Model-Driven Architecture (MDA)

1. Object Management Group (OMG) initiative
   • CORBA, UML, CWM, XMI
2. Ease transition from one platform to another version
3. Integrate with existing legacy applications
4. Apply domain-specific reference business models
5. Use UML 2.0 for all models
6. Provide framework for vendor-specific transformation mappings
7. Extend useful lifetime of system models
8. Support specialized computing environments
Sample ATCP Workflow

1. Stakeholder list → Identify system candidate actors → Actor list
2. Feature list → Identify candidate system use cases → Use case list
3. For each use case:
   - Actor list
   - Use case list → Draw system use case diagram → Use case diagram
4. For each actor:
   - [Optional] Identify roles → Roles [identified]
   - Use case diagram
5. Organize system actors and use cases → Packages [identified]
6. For each use case:
   - Actor or use case [identified]
   - Describe system use case or actor → Actor or use case [described]
Traditional RFP Process

1. Multi-year, phased approach; similar to waterfall
   - Business requirements phase
   - System requirements phases
   - Design phase
   - Implementation phase

1. Control costs
1. Open selection process
1. No vendor favoritism
Challenges With Traditional RFP Approach

1. Different awards for each phase (often to different vendors)
2. Deliverables produced by one phase often disregarded by vendor in next phase
   - Difficult to hold vendors accountable
   - Degenerate into contract management issues
3. Often result in massive change requests and overruns
   - Agency often “held hostage” due to incomplete product
Iterative Development and Government Agencies

1. Because of legislative statute, most agencies must follow established procurement process
   - Most agencies apply waterfall approach
   - Most activities are manual and not automated
   - Want to hold vendors accountable

1. Just-in-time (JIT) iterative approach often inconsistent with “every ‘i’ dotted and ‘t’ crossed” philosophy
   - Not planning each project detail out ahead
   - Don’t collect every single requirements ahead of time
   - Don’t wait until “the requirements are done”

1. Reality requires a compromise
Iterative RFP Process Management

1. Adaptation of “pure” iterative development and “traditional” RFP procurement process
2. Agile and adaptive collaborative development process
3. Significantly leverage UML for modeling
4. Comprehensive traceability strategy
5. Complete automatic generation of RFP consumable work products
6. Vendors held responsible for completely answering RFP
7. Objective response grading captured in tool
8. Simulation of multiple scoring algorithms
**EnABLES Project**

1. Department of Workforce Development (DWD), Unemployment Insurance (UI) Division
2. Enhanced Automated Benefits Legal Enterprise Services (EnABLES) project
3. Completely replace legacy (Cobol/IDMS) application with new distributed web application
4. Deploy new customer-centric business model
5. Reduce call backs by increasing levels of customer self-service
6. $30 million, seven-year project; look for off-the-shelf solution
7. See RFP and supporting materials at [http://www.dwd.state.wi.us/asd/procurement](http://www.dwd.state.wi.us/asd/procurement)
Project Inception: Four Iterations

1. Started at end of June 2002
2. Began with no process and no tool environment, staff with incredible domain experience but no UML or tool experience
3. Identified three iterations to finish RFP
   • Fourth iteration to review responses and award contract
4. Issued RFP and all supporting materials November 6, 2002
   • Contract awarded in early May 2003
5. ATC provided coaching, training, tool configuration
6. ATCP provided software development process framework
First Iteration: Establish Vision

1. Generated extended business service survey
   - Also known as business use case model survey
   - Included coarse-grained business workflow diagrams (activity diagrams)
   - Included business use case outlines
   - Completely auto-generated with tool reporting capabilities

1. Built transparent tool environment with real-time reporting
   - Team could use all their time to advance project
   - No team time required to produce reports
   - Focused on reviewing content
Sample Business Service Diagram

- Claimant
- UI Bank
- Print Mail Provider
- UI Tax General Accounting
- Child Support Agency
- Employer
- Claim Weekly Benefits
Second Iteration: Model Workflow

1. Eight weeks long
2. Launched with use case detailing and business workflow modeling with UML training
3. Supported with facilitated workshops
4. Captured detailed business use case specifications
5. Applied ATCP universal design process pattern
6. Banned the use of the word “Claim”
   - Too general; too specific
   - Meant too many things to too many people
Second Iteration: Model Workflow

1. Modeled internal workflow of each business use case
   - Used collaboration diagrams for business use case event flows
   - Used class diagrams for business participant responsibilities
   - Applied UML collaborations

2. Eight team members held over 50 meetings with 100 people to review detailed business use case specifications and internal workflow models

3. Medium-grained traceability from each use case flow to each interaction diagram

4. Generated business workflow realization surveys
Sample Internal Business Workflow

1. present claimable week
4. determine questions
10. present certification questions
13. review answers
15. request confirmation
17. send confirmed certification

2. receive claimable week acceptance
11. receive answers
16. receive confirmation

3. add
12. create
14. review

5. get certification questions
18. receive confirmed certification

6. determine appropriate questions
19. create weekly certification
26. send certification
27. update activity log

9. get appropriate questions

20. get

18. receive confirmed certification

21. create
22. create
23. add weekly certification

7. get claim record
8. review for questions
24. update week claimed
25. update as claimed

28. add weekly certification filed

29. verify certification

work flow: Activity Log

contact: Activity Log

: Claimant

: Claims Taker

: Certification Answers

: Weekly Claim Processor

: Certification Processor

: Claimable Week

: Weekly Certification

: Benefit Certification/Disbursement Record

: Claim Record

: Benefit Records Processor
Third Iteration: Generate RFP

1. Eight weeks long
2. Launched with workshop to identify system use cases
3. Established fine-grained traceability from messages on individual flow diagrams to system use cases
   - Required extending traceability capabilities of tool set
4. Built business model data warehouse for reporting
5. Identified business and technical architectural requirements
Third Iteration: Generate RFP

1. Needed to make RFP contents navigable and useful to vendors
2. Established enterprise governance process
3. Applied ATAM framework for RFP response evaluation
4. Identified RFP questions and expected responses
5. Took two hours to completely generate all RFP materials
**Sample System Use Cases**

- Request Weekly Certification
- Complete Certification
- Receive Certification Confirmation
- View Alerts
- Verify Claimant Identity
- Identify Information Supplier
- Identify Information Supplier
- Tax Overpayment Manager
- Request Forced Payment
- Request Forced Payment
- Establish Payment Requirements
- Approve Forced Payment
- Payment Processor
- Establish Certification Requirements
- Policy Implementer
- Certification Processor
- Claims Taker
- Information Analyzer
Architecture Tradeoff Analysis Method SM (ATAM)

1. Applied Software Engineering Institute’s (SEI) Architecture Tradeoff Analysis Method (ATAM) by Kazman, Klein, and Clements
   - [http://www.sei.cmu.edu/ata](http://www.sei.cmu.edu/ata)

1. Technique for assessing value of architecture for off-the-shelf applications during government procurement processes

1. Uses quality attributes with focused questions to translate technical architecture concerns into business concerns

1. “The purpose of the ATAM is to assess the consequences of architectural decisions in light of quality attribute requirements”
<table>
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<th>Model Elements Identified</th>
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<tr>
<td>1. 35 business use cases</td>
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<tr>
<td>1. 75 business actors</td>
</tr>
<tr>
<td>1. 500 external business services</td>
</tr>
<tr>
<td>• Business use case flows</td>
</tr>
<tr>
<td>1. 400 internal workflows</td>
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<tr>
<td>• Business use case realizations</td>
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<tr>
<td>1. 2,000 internal business services</td>
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<tr>
<td>• Business object responsibilities</td>
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<tr>
<td>1. 80 internal business worker roles</td>
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<tr>
<td>1. 250 business entities</td>
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<tr>
<td>1. 300 system use cases</td>
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<tr>
<td>1. 500 RFP questions</td>
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<tr>
<td>1. 20 report templates</td>
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<tr>
<td>1. 50 consumables</td>
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<tr>
<td>1. 2,000 pages of RFP content</td>
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Automated Development Environment

1. Rational Rose for UML modeling
2. Rational RequisitePro for requirements management and basic traceability
3. Rational ClearQuest for change management
4. Rational SoDA for reporting
5. Extended light native traceability with custom traceability tool
6. Transparent tool usage critical
7. If something was not in the tool, it did not exist, and it did not appear in the RFP
Fourth Iteration: Scoring Responses & Issue Award

1. Six months long
   - Two months to wait for vendor responses
2. Built framework for capturing vendor responses
3. Executed and evaluated multiple scoring algorithms
4. Selected two finalists
5. Performed two one-week long vendor demonstrations
6. Evaluated vendor demo performance
7. Issued award
8. Finalized contract details
Moving Forward

1. Establish iterative project office inside automated development environment begins July ’03
2. Base system installation begins Sept ’03
3. Gap analysis begins Oct ’03
4. Customization begins Feb ’04
5. Apply MDA principles to generating functional software from UML specifications
6. Supports ITSC federal guidelines for unemployment insurance system modernization efforts
Conclusions

1. EnABLES RFP process could not have been done and will not be sustainable without MDA principles
2. Built a computational independent model
   - CIM has its own CIM, PIM, and PSM
3. Will be detailing PIM and generating multiple PSMs
4. Transformations mostly done by hand
   - Enforced and captured by tools
   - Transformations more automated moving forward
5. Provided framework for implementing custom-developed or off-the-shelf product on any technical platform
Questions?

Thank you for your attention and participation!