Using the Agile Methodology to Mitigate the Risks of Highly Adaptive Projects

Dana Roberson
Quality Software Engineer
NNSA Service Center

And

Dr. Mary Anne Herndon
Transdyne Corporation
Agenda: Using the Agile Methodology to Mitigate the Risks of Highly Adaptive Projects

- Risks in Highly Adaptive Projects
- Typical Management Scenarios
- Agile Software Development Methodology
- Steps for Implementing CMMI-DEV Practices in Agile Projects
- Strategy Map for Using Agile Practices
- Benefits
- Lessons Learned
Using the Agile Methodology to Manage Risks of Highly Adaptive Projects

<table>
<thead>
<tr>
<th>Dynamic Requirements</th>
<th>Impact of customer co-location on requirements management &amp; tasking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive Schedule</td>
<td>Immediate effect of changing customer priorities &amp; direction</td>
</tr>
<tr>
<td>Limited Resources</td>
<td>Typical work performed on a fixed LOE or time &amp; material basis</td>
</tr>
</tbody>
</table>
The requirements are ALWAYS changing.

Time and schedules are ALWAYS aggressive.

Resources will ALWAYS be tight.

To mitigate these risks you need processes that address these risks to allow rapid adaptation.
### Scenario for Risk Management Practices in Small Businesses

Small businesses often function in focused markets as:
- Suppliers of specialized on-site technical services, key personnel, applications or products
- Domain specialists
- Staff augmentation

These focused markets may not provide needed revenue or market share growth to readily prosper in today’s economy.

### Costs of improving project and risk management practices are considered key investments in these vulnerable cash flow environments.

Both near and long term cash flow analysis typically includes factors such as:
- Customer base stability & revenue cycles
- Projected revenue growth
- Costs of acquiring appropriate resources to improve management practices, such as training, process engineers and collaborative software and hardware.
Understanding and improving project management and risk management practices is a key factor in revenue growth. Planning improvements typically includes assessment of critical factors such as:

- Required resources (available staff, feasible schedule, platforms, facilities, collaborative tools)
- Past performance data (costs, schedules, lessons learned)
- Training in the domain and software development method (Agile)
- Risk identification and impact assessment
- Risk mitigation

A practical knowledge base useful for improving management practices can be provided by process models, such as CMMI and ISO 9000. Obtaining CMMI benchmarks and ISO 9000 certifications are often stepping stones to expand government and commercial customers.

Selecting and implementing any process and life cycle models is both costly and can be risky as there are no guarantees of success on-site with the customer.
Planning a process improvement strategy typically includes identifying problematic projects with typical issues such as:

- Limited resources and ambitious schedules
- Lack of experience and staff training
- Excessive staff turnover rate
- Stability of current customer base
- Projection of market growth
- Over commitment of key staff
- Inaccurate planning data for costs and schedule

Implementing a process improvement strategy, small businesses should customize a path of small, adjustable steps.

An example of a path of small steps is a hybrid approach of improving project and risk management practices in CMMI-DEV first.

The next step is a selection of a life cycle model that is suitable for the work requirements, location and level of customer participation.
Building Bridges Using CMMI-DEV and Agile to Manage Risk

CMMI Is Designed to Be Tailored to Your Business Environment.

- Fully align process improvement with your business goals
- Look at what you are actually doing,
- If a “good fit” – document and follow
- Leverage off existing activities – e.g. Agile
- Promote maximum flexibility and efficiency in your process improvement approach
- Emphasize measurement and analysis
Key Process Improvement Factors & Sources of Risks

All KEY process improvement factors introduce sources of risks to developers!

Choosing an incompatible life cycle development model impacts all other key process improvement factors.
Sources of Risks in Life Cycle Models

- Waterfall
  - cycle times
  - impact of changing requirements
  - direct end user involvement

- Spiral
  - cycle times
  - impact of changing requirements
  - direct end user involvement

- Agile
  - inadequate training
  - customer awareness
  - management advocacy
Framework of the CMMI-DEV model provides:

1. Increases in implementation efficiency due to redundancy in model functions, such as Project Management & Support Process Areas and generic practices.

2. Minimal opportunities for conflicts with customer, staff and resources with adequate model understanding.
Steps for Implementing Risk Management with CMMI-DEV & Agile

Understand the Risks

Identify risks:
- project specific
- technical impacts
- mitigation plans
- customer involvement

Evaluate business opportunity

“Risk of winning”
- Contract type
- New customer
- Technical complexity
- Staff

Lessons Learned
- What did we do well?
- Where were we lucky?
- What do we need to improve?

Develop Agile project plan

Key growth Investments:
- Process & Agile training
- Collaborative H/W & S/W
- Process engineer support
Strategy Map for Implementing Risk Management Using Agile and CMMI-DEV

- Agile Method Engineering Techniques
- CMMI-DEV Engineering Management Support
- Dynamic requirements
- Limited resources
- Aggressive schedule
- Risk management tools
- Scrum
- Burn Down (MS Excel)
- White Boards
- Peer Reviews – Impromptu & Team Programming
- Quality Assurance
- Configuration Management
- Measurement
- Structured Decisions
- Limited resources
Risk reduction is **NOT** fighting fires or "just in time solutions."

Reduce variation.

**Recognize and document best practices.**

- Remove activities that have no value to the organization.
- Improve customer satisfaction.
- Process improvement is important as it has often been said that process accounts for 80% of all problems while people account for the remaining 20%.

- It is simply a way of looking at how we can do our work better.
- A series of actions taken to identify, analyze and improve existing processes.
- These actions often follow a specific methodology or strategy to create successful results.

- Provide lessons learned.
- Encourage staff members to contribute!
### What are Best Practices and Benefits?

Best practices are effective, high-leverage technical and management **PROCESSES** that have been implemented and proven on successful projects.

<table>
<thead>
<tr>
<th>Examples of Best Practices</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven Models – i.e. CMMI-DEV, ISO 9001</td>
<td>Risks are reduced &amp; mitigated</td>
</tr>
<tr>
<td>Project Planning</td>
<td>Repeatability is achieved</td>
</tr>
<tr>
<td>Measurement and Control</td>
<td>Clarity and understanding are increased</td>
</tr>
<tr>
<td>Peer Reviews</td>
<td>Common terminologies and consistent styles are developed and followed</td>
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<tr>
<td>Risk Management</td>
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<td>Quality Assurance</td>
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<td>Status Reporting</td>
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<td>Configuration Management</td>
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<td>Agile Software Development</td>
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</table>
## Typical “Roadblocks and Hurdles” to Process Improvement

<table>
<thead>
<tr>
<th>Resistance to Change</th>
<th>Lack of Commitment and Resources</th>
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<tbody>
<tr>
<td>“We tried process improvement before, and it didn’t buy us anything.”</td>
<td>“Who’s paying for it? If it isn’t paid for, we’re not doing it.”</td>
</tr>
<tr>
<td>“CMMI /TQM/Agile/Lean Six Sigma/ and best practices are just another fad.”</td>
<td>“I’m retiring/transferring from this job soon, I don’t have to get involved.”</td>
</tr>
</tbody>
</table>

Developers don’t have the time because there is so much rework.
Activities are known as ‘timeboxes’.

Each iteration passes through a full software development cycle, including:
- planning,
- requirements analysis,
- design,
- unit tests, Quality Assurance testing,
- coding until the unit tests pass and a working product is finally demonstrated to stakeholders.

“Documentation is no different than software design and coding for assuring repeatability and re-generation.

Strong team discipline is required to code for agility.

At the end of each iteration, stakeholders re-evaluate project priorities with a view to optimizing their return on investment.

Agile emphasizes face to face communication with all stakeholders!
Agile – Navigating Class IV Rapids (AKA Risk Reduction)

- Agile development methods minimize risk by developing software in multiple 'iterations' of short time frames
- Each iteration passes through a full software development cycle
- In our Agile projects, SCRUM Boards, Burndown charts and other project and working artifacts were defined and identified as “CMMI artifacts”.
- Face to face communication & EA reviews ensure peer review.
- At the end of each iteration, stakeholders re-evaluate project priorities and risks.
### Agilizing CMMI – SCRUM and CMMI

#### Incorporating CMMI Processes
- Tailoring processes to incorporate Agile iterations
- Mapping CMMI SPs to Agile iterations and artifacts
- Monitoring and controlling projects requirements and changes
- Testing defects

#### Using Agile at our shop

<table>
<thead>
<tr>
<th>Software Tools</th>
<th>Agile &amp; CMMI-DEV Processes (Process Asset Library)</th>
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<tbody>
<tr>
<td>Visual Source Safe</td>
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<tr>
<td>Development Environment</td>
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<td>SQL Management Studio</td>
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<td>Development environment</td>
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<td>Enterprise Architect</td>
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<td>Requirements traceability</td>
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<td>Axosoft OnTime</td>
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<tr>
<td>Defect Management</td>
<td></td>
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</table>
Where to Start?

• Look at what you have in place
  – What are you doing well - right now
• Establish your SEPG
• Tailor the CMMI process descriptions to map to current processes
  – “By-in” by Software Engineering and Management
  – PAL
• Develop processes for things you are not doing now
• Discuss with Software Engineering Team
• **Train the Team !**

• Follow up on how processes are being implemented and
• **Modify if necessary to get a “best fit” !**
## Process Asset Library (PAL)

Library of project plans, process descriptions, forms, and templates.

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<td>8:54 AM</td>
<td>Young, Michael</td>
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</tbody>
</table>
Process Area Description

Standards – Developed by TWG within the SEPG available to all developers on SharePoint Site
- Work Environment Standards
- Web Design and Usability Guidelines
- Coding Standards
Development
  Initial Planning Cycle
  Project Backlog
  EA
Management –
  Tracked in EA through testing
Development
  Initial Planning Cycle
  Project Backlog
  EA
Management –
  Tracked in EA through testing
Agile Focus on Quality – Built-In

• Testing is built into each sprint

Scrum
• Assign tasks to resources
• Reassign based on burndown

Sprint Plan
• Requirements
• Available resources
• Development & QA

Defect Workflow
• Maintenance resources
• QA assignment

1 Executive Summary

This Quality Assurance Assessment Report documents the details of an onsite Process Area quality audit. The audit was performed by Software Quality from April 9, 2009, through April 15, 2009.

An analysis of the ITD software and project processes, documentation, and work products was performed. This included review of documentation, overarching procedures, Sprint retrospectives and burn down charts, notes, meeting minutes, and interviews. The analysis was based on a tailored mini-appraisal or “gap analysis,” as described in the CMMI SCAMPI B model.

The overall rating of this assessment indicated that the processes chosen to be audited were partially to largely implemented. However, several process areas were rated and not yet as ML 3 and are still in the implementation stage. Assessment results will be reported to the associated project leaders, team leaders, and selected management.

<table>
<thead>
<tr>
<th>Process Area</th>
<th>Ranking</th>
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<tbody>
<tr>
<td>Measurement and Analysis</td>
<td>9 FI</td>
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<tr>
<td>Process and Product Quality Assurance</td>
<td>7.5 LI</td>
</tr>
<tr>
<td>Configuration Management</td>
<td>NY</td>
</tr>
<tr>
<td>Decision Analysis and Resolution</td>
<td>9 FI</td>
</tr>
<tr>
<td>Project Planning</td>
<td>8 FI</td>
</tr>
<tr>
<td>Project Monitoring and Control</td>
<td>8.4 LI</td>
</tr>
<tr>
<td>Integrated Project Management</td>
<td>8.3 LI</td>
</tr>
<tr>
<td>Risk Management</td>
<td>8.2 LI</td>
</tr>
<tr>
<td>Requirements Management</td>
<td>6.4 LI</td>
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<tr>
<td>Requirements Development</td>
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<td>Technical Solutions</td>
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<td>Product Integration</td>
<td>8.6 LI</td>
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<tr>
<td>Verification and Validation</td>
<td>8.8 LI</td>
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</tbody>
</table>

Assessor: Dana Roberson
Updated for Factual Accuracy: Rebecca Dickmenn

Corrective actions and process improvements, based on the assessment results, will be documented and monitored. A follow-up on the corrective actions derived from the assessment results will take place within three months of acceptance of this report.
Sprint Planning/Scrum

- **Product Backlog**
  - Sprint Planning/Plan
    - Determine sprint timeline
    - Determine available resources – risks
  - Scrum
    - What done
    - What Planned
    - Obstacles - Risks
  - Who, what, how
    - Requirements
    - Coding
    - Testing
    - Baselines
    - Documentation
  - Deliverable
    - Demonstration to stakeholders/CCB
    - Deployment to User
    - Acceptance Testing

- **Sprint Planning**
- **Sprint Backlog**
- **Daily Scrum Meeting**
- **Scrum Board**

Scrum Lifecycle (Iterative)
Sprint Planning

- Sprint Planning/Plan
  - Determine sprint timeline
  - Determine available resources

- Who, what how
  - Requirements
  - Coding
  - Testing
  - Baselines
  - Documentation

- Deliverable
  - Demonstration to stakeholders/CCB
  - Deployment to User Acceptance Testing
Design Process

- Project Plan
  - Overall Design
- Sprint Planning
- Daily Scrum
  - Developer review (Peer)
Gathering, Reviewing and Testing the Requirements

Enterprise Architect

Requirements Definition (Enterprise Architect)

Requirements Review (EA export to web interface)
- Peer Review
- Developer review
- CCB review

Requirements tied to activities and tests for traceability
Gathering and Managing Requirements - BA & QA

Activity: 1.01 Requestor Fills out SF-52

1.01 Requestor Fills out SF-52

1.02 Requestor Fills out Recruitment Checklist

1.03 Supervisor and Approvals

Manager Approves

Business Rule: Status: Not Run

Type: Standard

Run By: Dana Roberson

Checked By: [Blank]

Last Run: 2/10/2010

Description

Build web-based SF-52 form accessible by NNSA SC, HQ, and site offices.
Requirements Management and Tracking – SE and Customer
Coding/Unit Testing & Documentation

• Development
  – Development of Functional unit on DEV environment
  – Get latest of all code, unit test
  – Check in Code to Visual Source Safe
  – At prescribed interval, build full project, deploy to internal
  – testing environment
  – Automated Baseline Capture developed by team

  # Example of code

```sql
/* ***** Object: StoredProcedure [dbo].[rsARHearing] Script */
SET ANSI NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO

-- Author: Shane Seery
-- Create date: June 2, 2009
-- Modified date: August 11, 2009
-- Description: Retrieve data for the AR Hearing Report
-- added hearing request and deny dates dtr
-- ****************************

ALTER PROCEDURE [dbo].[rsARHearing]
    @StartDate datetime,
    @EndDate datetime
AS
BEGIN
    SET NOCOUNT ON;
```
Developer Interaction with QA reduces Risk

Internal Testing (DEV/QA)
- Developer notifies QA of functionality ready for testing
- Defect found by QA – entered into Axosoft Ontime
- Developer fixes defect rebuilds- workflow in Ontime Ready for testing on TEST
- “Defect Fixed” or “Failed Retest”

Testing is built into the development cycle
Early and frequent delivery ensures adequate time for feedback and reduces risk
Agile benefits the IT department assisting in quicker better quality and reduced work
Stressing repeatable processes for project management

User Acceptance Testing (STAGE)

Production (PROD)
New Box—If a change was made to an employee’s rating during the pay pool panel process a manager should be allowed to go in and edit their assessment of the employee to reflect just the new final rating.

Edited by Dana Roberson on Friday, September 03, 2010 at 12:01 PM verified comments comments box
## Acceptance Tests

<table>
<thead>
<tr>
<th>Name</th>
<th>Object</th>
<th>Current Status</th>
<th>Description</th>
<th>Input</th>
<th>Acceptance Criteria</th>
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</thead>
<tbody>
<tr>
<td>PAMS 1.1.1.2 Supervisor can initiate Performance Plan for employee</td>
<td>1.1.1 Create Employee Performance Plan - SPOs</td>
<td>Not Run</td>
<td>If employee is absent, supervisor can create performance plan for them.</td>
<td>Supervisor logs into PAMS, selects Employee, Selects Plan, Selects SPO from Library for edit or Supervisor creates SPO, Supervisor saves SPO.</td>
<td>Employee plan created</td>
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<tr>
<td>PAMS 1.1.1.3 An employee can have no more than two Open and Active Performance Plans</td>
<td>1.1.1 Create Employee Performance Plan - SPOs</td>
<td>Not Run</td>
<td>Employee has Active and Detail plan -</td>
<td>Employee logs into PAMS, Selects Plan, Selects SPO from Library for edit or Employee creates SPO, Employee saves SPO. Employee tries to do this three times.</td>
<td>No more than two Performance Plan(S) created</td>
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<td>PAMS 1.1.1.5 An Employee can only have two Supervisors (one of Record and one of Detail)</td>
<td>1.1.1 Create Employee Performance Plan - SPOs</td>
<td>Not Run</td>
<td>An Employee may have a supervisor of record and if necessary a Detail Supervisor.</td>
<td>Attempt to assign two supervisors to one employee.</td>
<td>Can assign Detail Supervisor, if Active Performance Plan is inactivated</td>
</tr>
<tr>
<td>PAMS 1.1.1.6 Only Performance Plans with reporting period of 90 days or more can be evaluated and assessed for Final Rating.</td>
<td>1.1.1 Create Employee Performance Plan - SPOs</td>
<td>Not Run</td>
<td>Performance Plans must have a reporting period of 90 days or more before they can be rated.</td>
<td>Attempt to rate Performance Plan of employee with less than 90 days on job.</td>
<td>System will give warning that employee has not worked at least 90 days</td>
</tr>
</tbody>
</table>

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[SEIPartner] [NASA]
Monitoring and Controlling by Establishing Measurement Objectives

The NNSA SC ITD Apps Team maintains the Measurement and Analysis Plan (MAP). MAP defines the process performance measurement foundation established by applying the Goal Question Metrics (GQM) to the Applications Mission Statement.

The Apps Team leverages higher maturity level process performance management tools to:

- Build process performance databases using statistical process control (SPC).
- Track variance analyses (control charts with standard deviations).
- Analyze defects, accuracy of resource estimation, development and maintenance productivity and customer satisfaction.
Measurement Objectives

Low-cost and high-quality software applications and services delivered rapidly, supporting high levels of customer satisfaction.

(Mission Statement)
# Monitoring and Controlling via Sprint Burndown Charts

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<tr>
<td>50 Make report framework work</td>
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<td>60 1222 - Add 'Recovery Act' checkbox to SP0</td>
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<td>70 1345 - Make red and green buttons readable by the color blind</td>
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<td>100 Check and set up interface items</td>
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</tbody>
</table>

### PAMSZ Burndown (Sprint 12)

- **Burndown Calc**: 115
- **% Work Completed**: 71.304348
- **Hrs/Day Baseline**: 11.5
- **Labor Hours Available**: 112
- **Hours Not Used**: -3

**Sprint Velocity**: 9.2
Tracking Progress Across Sprints

### Planned vs. Actual Project Labor Variance (%)

- **Month/Year:**
  - **Mar-08:** 2650.00, 2477.60, 12.97
  - **Apr-08:** 2250.00, 1745.00, 22.44
  - **May-08:** 2784.00, 2464.00, 10.78
  - **Jun-08:** 2556.00, 2517.50, 3.02
  - **Jul-08:** 3204.00, 3258.00, 18.91
  - **Aug-08:** 2047.00, 1820.00, 6.20
  - **Sep-08:** 1824.70, 1916.00, 5.00
  - **Oct-08:** 2055.00, 2352.00, 15.41
  - **Nov-08:** 2370.00, 2346.00, 1.01
  - **Dec-08:** 2236.00, 2166.00, 3.26
  - **Jan-09:** 2583.00, 2337.00, 8.75
  - **Feb-09:** 2758.00, 2872.00, 4.32
  - **Mar-09:** 2321.00, 2258.00, 2.71
  - **Apr-09:** 2857.00, 2842.00, 0.53

- **Mean (Avg):** 13.32
- **UCL:** 13.32
- **LCL:** 2.42
- **Month Status (RYG):**
  - **Apr-08:** G
  - **May-08:** G
  - **Jun-08:** G
  - **Jul-08:** G
  - **Aug-08:** G
  - **Sep-08:** G
  - **Oct-08:** G
  - **Nov-08:** G
  - **Dec-08:** G
  - **Jan-09:** G
  - **Feb-09:** Y
  - **Mar-09:** G

### Sprint Velocity (Work Completed/Sprint Days)

- **Month/Year:**
  - **Apr-08:** 13.32, 14.33, 32.66, 0.00
  - **May-08:** 16.42, 14.33, 32.66, 0.00
  - **Jun-08:** 17.89, 14.33, 32.66, 0.00
  - **Jul-08:** 10.34, 14.33, 32.66, 0.00
  - **Aug-08:** 21.69, 14.33, 32.66, 0.00
  - **Sep-08:** 22.36, 14.33, 32.66, 0.00
  - **Oct-08:** 15.53, 14.33, 32.66, 0.00
  - **Nov-08:** 29.71, 14.33, 32.66, 0.00
  - **Dec-08:** 24.50, 14.33, 32.66, 0.00
  - **Jan-09:** 18.30, 14.33, 32.66, 0.00
  - **Feb-09:** 10.97, 14.33, 32.66, 0.00

- **Monthly Status (RYG):**
  - **Apr-08:** G
  - **May-08:** G
  - **Jun-08:** G
  - **Jul-08:** G
  - **Aug-08:** G
  - **Sep-08:** G
  - **Oct-08:** G
  - **Nov-08:** G
  - **Dec-08:** G
  - **Jan-09:** G
  - **Feb-09:** G
  - **Mar-09:** G
Maintaining QA Assessments

1 Executive Summary

This Quality Assurance Assessment Report documents the details of an Area quality audit. The audit was performed by Software Quality from April 7, 2009, through April 15, 2009.

An analysis of the ITD software and project processes, documentation, and work products was performed. This included review of documentation, overarching procedures, Sprint retrospectives and burn down charts, notes, meeting minutes, and interviews. The analysis was based on a tailored mini-appraisal or “gap analysis,” as described in the CMMI SCAMPI B model.

The overall rating of this assessment indicated that the processes chosen to be audited were partially to largely implemented. However, several process areas were rated and not yet as ML 3 and are still in the implementation stage. Assessment results will be reported to the associated project leaders, team leaders, and selected management.

Assessment Summary – July 2009

<table>
<thead>
<tr>
<th>Process Area</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement and Analysis</td>
<td>FF1</td>
</tr>
<tr>
<td>Process and Product Quality Assurance</td>
<td>7.5.1</td>
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<tr>
<td>Configuration Management</td>
<td>NY</td>
</tr>
<tr>
<td>Decision Analysis and Resolution</td>
<td>FF1</td>
</tr>
<tr>
<td>Project Planning</td>
<td>FF1</td>
</tr>
<tr>
<td>Project Monitoring and Control</td>
<td>8.4.11</td>
</tr>
<tr>
<td>Integrated Project Management</td>
<td>8.3.11</td>
</tr>
<tr>
<td>Risk Management</td>
<td>8.2.11</td>
</tr>
<tr>
<td>Requirements Management</td>
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<tr>
<td>Requirements Development</td>
<td>NY</td>
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<tr>
<td>Technical Solutions</td>
<td>NY</td>
</tr>
<tr>
<td>Product Integration</td>
<td>8.6.11</td>
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<tr>
<td>Verification and Validation</td>
<td>8.2.11</td>
</tr>
<tr>
<td>OVER ALL</td>
<td>8.3.11</td>
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</tbody>
</table>

Assessor: Dana Robinson
Updated for: Formal Accuracy: Rebecca DiBene

Corrective actions and process improvements, based on the assessment results, will be documented and monitored. A follow-up on the corrective actions derived from the assessment results will take place within three months of acceptance of this report.
## Tracking Quality Corrective Actions

<table>
<thead>
<tr>
<th>Process Area</th>
<th># artifacts reviewed</th>
<th>Findings</th>
<th># FI</th>
<th># LI</th>
<th># PI</th>
<th># NY</th>
<th># CAP</th>
<th># CA completed</th>
<th>Date Completed</th>
<th>Re-Evaluation Date</th>
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<td>1 Need to show where relevant stakeholders have been involved training in OT</td>
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<td>4/21/2009 OT - Training: held on 11/12/08 for the full team. Emails: show training announcement and follow-up with Frank. Surveys, however, have been lost due to change in evaluation database. (This applies to OPD and OPF as well, as they were all handled together.)</td>
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<td>1 Need to show upper management and get responses</td>
<td>1 Need to show upper management and get responses</td>
<td>Jun-09</td>
</tr>
</tbody>
</table>
Management of complexity requires process discipline WHILE

Management of change requires rapid adaptability.

CMMI provides process discipline.

SCRUM (Agile) enhances adaptability and commitment.
Lessons Learned in Managing Risks Using CMMI-DEV and Agile

Understand that all process improvement opportunities, as with all investments, have costs and risks. Introducing Agile, as with any new technology, needs the advocacy of all project stakeholders.

Participation of key staff members in planning practice implementation is needed to understand the continuity and costs and identify the key risks, such as customer culture.

The CMMI Risk Management Process Area practices are easily tailored and implemented via a suitable template for Agile based projects.

The Agile method emphasizes on-going requirements & design verification, daily SCRUMS with customer participation and team “esprit de corp”. The Agile emphasis on these activities provides engineering practices that reduce risks in software engineering tasks.
CMMI-DEV is a process model, **NOT** a process description.

CMMI-DEV only defines "WHAT" to do, not "HOW" to do it.

Plan the process implementation so that you are taking advantage of the CMMI-DEV practices **AND**

Use the Agile Methodology for rapid turn around for low cost quality product.

Remember
You have just seen key benefits of using CMMI-DEV and Agile to reduce risks in software engineering from the “30,000 feet” level.

Questions or Comments?
Examples of Mapped CMMI Specific Practices to Agile Life Cycle Steps
1. Agile Life Cycle Start
   Project Pre-Work – Prior to initial iteration

   1.0 Develop Use Case Model including Use Case Point calculation to support effort estimation

   CMMI SPs
   PP 1.1; PP 2.1; PP 2.3; PP 2.4

   1.1 Complete and present Project Overview to ITRB
   REQM 1.1
   PP 1.2
   RSKM 2.1

   1.2 Establish Project’s PAL
   PP 1.2
   PP 1.3
   PP 1.4
   PP 2.4
   PP 2.5
   PP 2.6

   1.3 Establish Project’s requirements and design Structure in EA
   REQM 1.3; CM 1.2; CM 1.3; OPD 1.5; MA 1.3; PP 2.5

   1.4. Dev high-level understanding of software business context-
   RQEM 1.5; DD 3.2

   1.5 Define Project timeline, scope, goals, and objectives, stakeholders (IPT) and major deliverables
   PP 1.2
   PP 2.1
   PP 2.2
   PP 2.4
   PP 2.7

   1.6 Develop initial WBS, estimates and iteration and release plans

   1.7 Plan, facilitate and document initial stakeholder meeting

   1.8 Plan, facilitate and document initial stakeholder meeting

   1.9 Obtain approval to proceed to next iteration

   1.10 Prepare and distribute initial status report

   Artifacts
   SharePoint Node
   Project Repository

   Enterprise Architect Package
   Requirements and Design tool

   Agile Artifact Project Backlog including
   hours and estimates
   PP 2.2
   PP 2.5
   PP 3.1
   PP 3.2
   PP 3.3
   REQM 1.2
   MA SG 1

   Project Status Report