Effective CMMi Implementation in Agile environment with fresh team

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ATOS – MUMBAI - INDIA

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Introducing Atos

Atos is an international information technology services company, delivering e payment services, consulting, systems integration, managed services and cloud services.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. It is the Worldwide Information Technology Partner for the Olympic and Paralympic Games and is quoted on the NYSE Euronext Paris market.

Atos operates under the brands Atos, Atos Consulting & Technology Services, Worldline and Atos Worldgrid.

- More than 77,000 business technologists worldwide in more than 47 countries
- Worldwide headquarters in Paris, France
From local offices to global powerhouse
Geographical breakdown of 77,100 Atos headcount

- **Benelux & The Nordics**: 8,400
  - Belgium
  - Denmark
  - Finland
  - Luxembourg
  - Netherlands
  - Sweden

- **Central & Eastern Europe**: 8,000
  - Austria
  - Bulgaria
  - Croatia
  - Czech Republic
  - Italy
  - Poland
  - Romania
  - Russia
  - Serbia
  - Slovakia
  - Turkey
  - Switzerland

- **North America**: 4,000
  - Canada
  - USA

- **UK & Ireland**: 10,600
  - Portugal
  - Spain

- **France**: 13,600

- **Germany**: 10,200

- **Iberia**: 5,700
  - Portugal
  - Spain

- **India, Middle East and Africa**: 9,400
  - India
  - Morocco
  - South Africa
  - United Arab Emirates
  - Qatar
  - Saudi Arabia

- **Asia Pacific**: 4,100
  - Australia
  - China
  - Indonesia
  - Japan
  - Hong Kong
  - Malaysia
  - Philippines
  - Singapore
  - Taiwan
  - Thailand
CMMi & Agile

<table>
<thead>
<tr>
<th>CMMi Model</th>
<th>Agile</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMMi Process Model</td>
<td>Agile Manifesto</td>
</tr>
<tr>
<td>Customer involvement depends on the project, not necessarily high</td>
<td>High Customer involvement</td>
</tr>
<tr>
<td>Process maturity matters rather than mature team</td>
<td>Mature team</td>
</tr>
<tr>
<td>Process centric</td>
<td>People centric</td>
</tr>
<tr>
<td>Any life cycle methodology is acceptable</td>
<td>Iterative approach</td>
</tr>
<tr>
<td>Formal acceptance criteria</td>
<td>Product owners acceptance</td>
</tr>
<tr>
<td>Formal documentation, test plans, test logs</td>
<td>Not mandatory to have formal documentation</td>
</tr>
<tr>
<td>Expects formal testing process</td>
<td>Testing method depends on product owner may be without formal test plans</td>
</tr>
<tr>
<td>Distributed Team</td>
<td>Co-located team</td>
</tr>
<tr>
<td>Billing type could fixed price or output based</td>
<td>Billing type are time and material</td>
</tr>
<tr>
<td>Contractually driven market consisting of large organization</td>
<td>Fast moving market of small organization</td>
</tr>
</tbody>
</table>

The objective with CMMi and Agile are evolved are different, there are differences in the approach however both aims at delivering successful software projects.

In this paper, we elaborate on how we have blended the two methodologies to take advantages of both along with the solution that we have implemented.
An organization with CMMi certification MUST sustain the CMMi processes to reap the benefits of CMMi implementation.

Sometimes client mandates to use Agile methodology.

For some new technologies like mobile computing, Agile approach is best approach.

High Risk of evolving requirements for product development – Agile methodology is more suitable.

The need of an hour is to leverage best practices of both methodologies.
Agile - Benefits

► Reach Business Value faster with better quality

Better time-to-market of features (ROI = BV↑ / C↓)
– Deliver Business Value
– Speed-up operational deliveries (continuous integration & testing)

► Frequent inspection of actual working software

Strengthened effective collaboration between the client and the project team
– Better synchronization of functional and technical features
– Constant clarification phases

► Faster decision making

To take a Go, No-Go decision at the end of each sprint
– Short period = postpone difficult decisions
– You can start without knowing all, you can decide when you know...
Implement Agile and / or Sustain CMMi

Challenges

- Sustain CMMi & Implement Agile
- Junior / Fresh Team
- Distributed team
- Attrition
- Quality & Integration issue
- Standardisation
- Estimation
- Meet or Exceed customer expectation
About the project

Client
• Giant Player in European market
• Specialized in electronic payment services for financial markets
• eServices for customers and citizens
• 6 year relationship with ATOS India

Scope of work
• Analysis & Design
• Development, Unit test
• Release Integration test
• Enhancements, Evolutions
• Maintenance and Support

Geography
• France (4 different cities)
• Germany (2 cities)
• Belgium
• India – 3 cities, Mumbai, Pune, Bangalore

Technology
• Java
• J2EE
• Oracle
• C
• C++

Size
• Team: 300+
• Duration: > 6 years ..
Common Global Process

Projects
Traditional Development Method

Common Global Process blending agile and traditional

Projects
Agile

Projects
Agile + CMMi
Common Process for Agile + CMMi

Developed a framework for Project Team to implement Agile in Atos. The project team has to be trained in Scrum methodology and consists of experienced, multi-disciplinary persons taking full responsibility for their work. All activities of agileGDP are mandatory but should be applied in accordance with the size and complexity of the project.

**agileGDP is:**
- a lightweight (not weak) framework
- a representation of agile values and principles based on SCRUM and eXtreme Programming
- Some agile processes are strengthened considering standards and organizational requirements for ISO 9001:2008, CMMI.

Defines process, guidelines, templates
To ensure that we sustain CMMi process model in the Agile environment, we conducted an exercise to map the CMMi Process area and agile environment and arrived at project specific process that satisfies the CMMi requirements as well as ensure Agile manifesto is adhered with

<table>
<thead>
<tr>
<th>CMMI Process areas</th>
<th>Agile</th>
<th>Project specific Tailored process considering CMMi and Agile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maturity Level 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requirement Management (REQM)</td>
<td>Project Backlog</td>
<td>Intake Kick off meeting, User stories, Clarifications, Backlog refinement, Review and approval of requirements</td>
</tr>
<tr>
<td>Project Planning (PP)</td>
<td>Sprint Planning</td>
<td>EPIC / Stories / Sprint Planning Standardization of estimation model</td>
</tr>
<tr>
<td>Project Monitoring &amp; Control (PMC)</td>
<td>Daily Huddle meetings</td>
<td>Daily huddle Meeting, Project Dashboards, Burndown charts, Sprint closure meeting</td>
</tr>
<tr>
<td>Supplier Agreement Management (SAM)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Process &amp; Product Quality Assurance (PPQA)</td>
<td>No Audits</td>
<td>Regular Audits by external quality auditor using standard audit checklist Retrospective meetings</td>
</tr>
<tr>
<td>Configuration Management (CM)</td>
<td>Configuration tools</td>
<td>Configuration tools</td>
</tr>
<tr>
<td>Measurement &amp; Analysis (M &amp; A)</td>
<td>Measurements as per project dashboard, tools used for project monitoring</td>
<td>Standardized few measurements across the Sprints maintained in standard contract dashboard</td>
</tr>
</tbody>
</table>
## Sustain CMMI & Implement Agile

### Map CMMI Process Area to Agile implementation

<table>
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<tbody>
<tr>
<td><strong>Maturity Level 3</strong></td>
<td><strong>Agile</strong></td>
<td><strong>Integrated Project Management (IPM)</strong> Continuous integration</td>
</tr>
<tr>
<td>Integrated Project Management (IPM)</td>
<td>Continuous integration</td>
<td>Risk Management (RSKM) Risk management at early phase Maintain Projects Risk register</td>
</tr>
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<td>Risk Management (RSKM)</td>
<td>Risk management at early phase Maintain Projects Risk register</td>
<td>Decision Analysis &amp; Resolution (DAR) Structured Decision making process</td>
</tr>
<tr>
<td>Decision Analysis &amp; Resolution (DAR)</td>
<td>Structured Decision making process</td>
<td>Requirement Development (RD) User case documentation</td>
</tr>
<tr>
<td>Requirement Development (RD)</td>
<td>User case documentation</td>
<td>Technical Solution (TS) Decision on tooling Decided at the beginning of the project</td>
</tr>
<tr>
<td>Technical Solution (TS)</td>
<td>Decision on tooling Decided at the beginning of the project</td>
<td>Product Integration (PI) Continuous Integration</td>
</tr>
<tr>
<td>Product Integration (PI)</td>
<td>Continuous Integration</td>
<td>Verification (VER) Pair Programming Peer Review, Peer testing, Code review checklist, Sonar Dashboard</td>
</tr>
<tr>
<td>Verification (VER)</td>
<td>Peer Review, Peer testing, Code review checklist, Sonar Dashboard</td>
<td>Validation (VAL) Automated Testing QTP, CIBORG</td>
</tr>
<tr>
<td>Organization Process Focus (OPF)</td>
<td>Innovation workshops, Regular tech forums</td>
<td>Organization Process Definition (OPD)</td>
</tr>
<tr>
<td>Organization Process Definition (OPD)</td>
<td>Continuous Agile training program, Innovation workshops. Tracking</td>
<td>Organization Training (OT) Agile clubs, Agile coaches</td>
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<tr>
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<td><strong>Validation (VAL)</strong></td>
<td>Automated Testing</td>
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<tbody>
<tr>
<td><strong>Maturity Level 4</strong></td>
<td><strong>Agile</strong></td>
<td><strong>Quantitative Project Management (QPM)</strong> Agile project specific KPI measurements standardization of definitions and tracking across sprints. KPI's are maintained at contract dashboard</td>
</tr>
<tr>
<td>Quantitative Project Management (QPM)</td>
<td>Agile project specific KPI measurements standardization of definitions and tracking across sprints. KPI's are maintained at contract dashboard</td>
<td>Organization Process Performance (OPP) Periodic release of performance baselines for Agile - KPI's</td>
</tr>
<tr>
<td>Organization Process Performance (OPP)</td>
<td>Periodic release of performance baselines for Agile - KPI's</td>
<td><strong>Maturity Level 5</strong></td>
</tr>
<tr>
<td><strong>Causal Analysis &amp; Resolution (CAR)</strong></td>
<td>Defect analysis, defect prevention actions</td>
<td><strong>Organization Improvement Management (OPM)</strong> Org level improvement suggestions,</td>
</tr>
<tr>
<td><strong>Organization Improvement Management (OPM)</strong></td>
<td>Org level improvement suggestions,</td>
<td></td>
</tr>
</tbody>
</table>
The paradox is Agile methodology expects “Experienced” – relatively non Agile team
The cost pressure and organization policy mandates the projects to include junior & fresh team

Solution
- Detailed use case documents – elaborating requirements of each story
- Pair Programming – to quickly induct the new member in team
  - Grooming of Junior resources effectively
  - Less involvement of Senior resources to support juniors
  - Juniors start working independently after 2-3 sprints
  - On job mentoring is faster and effective
  - Reduced Learning curve
- 2 SCRUM masters for one sprint
  - address issue of distributed team
  - provides career path
  - Reduces Communication gap
  - No loss of information
  - Creates backup of Scrum master
- Proxy Product Owner
  - Business Analyst in India works as Proxy product owner
  - Provides clarifications
  - Keeps the document up to date
- Direct communication with Proxy Product Owner
- Weekly meetings with Customer
Distributed Team

Agile expects co-located teams .. which is a kind of dream in today’s distributed environment ...
Distributed Team

- Agile expects co-located team

- The project scenario
  - Product Owners : Europe
  - End Users : North America
  - Development team –
    - distributed in India
      - Mumbai
      - Pune

- Solution
  - Infrastructure & Tooling
    - Jira & Green Hopper
    - SONAR Dashboard
    - CIBORG – Continuous Integration tools
    - RTC – Rational Team Concert
  - Scrum of Scrum
    - Two Scrum Masters for one sprint
    - Creates Back up Scrum Master
  - Zero – Email
    - Enterprise Social Networking tool (Blue kiwi)
    - Lync : Social collaboration tools
  - Detailed Planning in Green Hopper / RTC
    - Product Backlog Management
Attrition

Attrition is unavoidable in India – especially for development team

Solution

- **Two Scrum masters**
  - Ensures the knowledge is retained
  - Detailed use case documentation
  - Tooling
  - Knowledge Management tools
  - Better career path

- **Pair Programming**
  - The Pair programming one junior and one senior person has worked well
  - On job mentoring is faster and effective
  - Reduced Learning curve
Quality & Integration Issues

- Special attention of Documentation and test plan preparation
- Junit is used for Automated testing
- Details of Story
- Definition of “Done”
- Lessons Learnt documents Retrospective Documents

Advantages:
- Team Autonomy
- Standardization
- Ownership
- Increased confidence

May 2014

Quality & Integration issue

[Customer] Non web customer

Description

*Object: To fix the SUPPORT-5895*

A non web customer is a customer registered in the SI because he is doing shopping in the physical shops, and accordingly he has no authentication data in the SI.

For this reason, doing a search for these clients with the “Customer search” portlet causes an error.

This was discovered in the Diamant Project.

1. The Diamant project must provide an XML used to integrate such a customer. Done Cf. the linked SUPPORT-5885
2. Run this one to integrate the customer in the database
3. Connect the bug in the Customer search portlet
4. Check all the portlets with that customer to identify all other possible bugs

Acceptance Test:
- The administrator searches for a non web customer and he is correctly retrieved for fields customer ref, type, email, name.
- The administrator views the orders of a non web customer successfully.
- The administrator views and updates the details of a non web customer successfully.
- The administrator views and updates the contacts of a non web customer successfully.
- The administrator views the authentication details of a non web customer and it is empty.
- The administrator views and updates the subscriptions info of a non web customer successfully.
- The administrator views and updates the newsletter subscriptions of a non web customer successfully.
- The administrator views the reviews of a non web customer and updates their status successfully.
- The administrator views and updates the metadata of a non web customer successfully.
The DoD is a clear and concise list of requirements that a software Increment must adhere to for the team to call it complete. Until this list is satisfied, a product Increment is not done. During the Sprint Planning meeting, the Scrum Team develops or reconfirms its DoD, which enables the Development Team to know how much work to select for a given Sprint. Further, a common DoD helps to:

- Baseline progress on work items
- Enable transparency within the Scrum Team
- Expose work items that need attention
- Determine when an Increment is ready for release

The Definition of Done is not changed during a Sprint, but should change periodically between Sprints to reflect improvements the Development Team has made in its processes and capabilities to deliver software. A story is accepted when it is passes all checks mentioned in DOD.

CMMi Process Areas: PI, VER, VAL, PPQA
Quality & Integration Issues

► Automated Testing
  – Usage of cIBorg (Continuous Integration) and Sonar tool
  – QTP for testing

► Save time in installations & deployments by automating them
► Continuous build to reduce tunnel effect
► Earlier detection of deviations by counterparts
► On line “Project health” reporting
► Detect regression and bugs upstream by automating unit testing
Standardization
Process & Tools

- **Standardized**
  - **Agile Process**
    - Organization level process for Agile
  - **Standard Tooling**
    - Sprint Planning – Jira / Green Hopper / RTC
    - Code Quality – Sonar Dashboard
    - Communication – Blue Kiwi – Social Enterprise Network
    - CIBORG – Continuous Integration
  - **Reporting**
    - Sonar Dashboard
    - Burnout Chart
  - **Estimation Model**
    - Definition of story point
    - Productivity ratio
  - **Measurements**
### Standardization - Agile Metrics

Historical Data available for analysis

- **Standardized the Agile metrics definitions**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Objective</th>
<th>Calculation</th>
<th>Target</th>
<th>Indications</th>
<th>Condition</th>
<th>Target</th>
<th>Jan-14</th>
<th>Feb-14</th>
<th>Mar-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Velocity Ratio</td>
<td>Tracks velocity trend per Sprint</td>
<td>Velocity Ratio = (Current Sprint Velocity per hour) - (Baselined Velocity for the project per hour)/(Baselined Velocity for the project per hour)</td>
<td>&gt;=0</td>
<td>&gt; 0 : Positive Velocity improvement trend&lt;br&gt;0 : Velocity as per baseline&lt;br&gt;&lt; 0 : Velocity not as per expectations; take corrective action</td>
<td>&gt;=</td>
<td>0</td>
<td>-0.056</td>
<td>-0.200</td>
<td>0.200</td>
</tr>
<tr>
<td>Story Acceptance Ratio</td>
<td>Measure the quality of the deliverables every Sprint</td>
<td>Story Acceptance Ratio = (No. of Stories Accepted)/( No. of Stories in Sprint)</td>
<td>&gt;=90%</td>
<td>= 100% -&gt; Very good quality&lt;br&gt;90% and &lt; 100%: Quality meets expectations&lt;br&gt;&lt; 90%: Take action</td>
<td>&gt;</td>
<td>90%</td>
<td>94%</td>
<td>95%</td>
<td>92%</td>
</tr>
<tr>
<td>Story Completion Ratio</td>
<td>Measure the budget and timeliness of deliverables every sprint</td>
<td>Story Completion Ratio = (No. of Stories Accepted)/( No. of Stories planned in Sprint)</td>
<td>&gt;=90%</td>
<td>= 100%: Very Good Quality, within budget &amp; as per schedule&lt;br&gt;90% and &lt; 100%: Meets Expectations, scope for improvement&lt;br&gt;&lt; 90% -&gt; Deliverables NOT meeting quality, Take actions</td>
<td>&gt;</td>
<td>90%</td>
<td>88%</td>
<td>90%</td>
<td>95%</td>
</tr>
<tr>
<td>Productivity</td>
<td>Measures Productivity of the team</td>
<td>Actual efforts / Number of Story points</td>
<td>&lt; 8</td>
<td>&lt; 6 : Good Productivity&lt;br&gt;10 : Issues - Need actions</td>
<td>&lt;</td>
<td>8</td>
<td>7.8</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>
Standardized the definition of Story points across the project
- The definition and concept of story point is based on the same fundamentals of Function Points
- There are studies which says Function point measurements have worked in Agile; however in Atos – we have encountered implementation issues
- Sometimes the stories of too small – making the function point count difficult
- Hence, an organization specific objective measurement of story points are arrived and published

“Story Point” truly represents the “Size” of functionality getting delivered

Fibonacci series is used to take care of uncertainty

Effort estimation is based on Size of sprint in terms of story point * Productivity ratio
## Story Point Standard Definition

### an example

<table>
<thead>
<tr>
<th>S No</th>
<th>User Story</th>
<th>Task</th>
<th># Story Points</th>
<th>Task Details</th>
</tr>
</thead>
</table>
| 1    | Search & List    | Search and List page                     | 5              | Search Criteria ($\leq 8$ fields)  
List Page  
Integration with BL                                                                                                                                                                                                                                                                                                                         |
| 2    | CRUD page        | Create, Update, View and Delete operations | 21             | Text fields $\leq 10$, radio buttons $\leq 5$, drop down $\leq 5$, check boxes $\leq 5$, Zones $\leq 2$, Calendar $\leq 4$, Dependent Select $\leq 2$  
Client/Server side validation on all fields  
Buttons - Save and Cancel functionality  
Integration with BL                                                                                                                                                                                                                                                                 |
| 3    | CRUD page        | Create, Update, View and Delete operations | 13             | Text fields $\leq 8$, radio buttons $\leq 2$, drop down $\leq 2$, check boxes $\leq 2$, Zones $\leq 1$, Calendar $\leq 2$, Dependent Select $\leq 1$  
Client/Server side validation on all fields  
Buttons - Save and Cancel functionality  
Integration with BL                                                                                                                                                                                                                                                                 |
| 4    | CRUD page        | Create, Update, View and Delete operations | 8              | Text fields $\leq 5$, drop down $\leq 2$, Calendar $\leq 1$  
Client/Server side validation on all fields  
Buttons - Save and Cancel functionality  
Integration with BL                                                                                                                                                                                                                                                                 |
| 5    | Tree Hierarchy   | Display tree hierarchy                   | 8              | Tree hierarchy population using KAWWA tree component  
Details section  
Add, Remove, Edit node functionalities                                                                                                                                                                                                                                                                                                     |
| 6    | Tree Grid Hierarchy | Tree Grid Hierarchy Display               | 13             | Tree Grid hierarchy population  
Collapse/Expand functionality  
Add, Remove, Edit node functionalities                                                                                                                                                                                                                                                                                                     |
| 7    | BreadCrumb       | BreadCrumb Navigation                     | 2              | Breadcrumb navigation                                                                                                                                                                                                                                                                                                                        |
| 8    | Tabs             | Main Tab and Sub Tabs                    | 2              | Main Tab creation and population  
Sub Tabs creation and population                                                                                                                                                                                                                                                                                                              |
| 9    | Popup Window     | Display Popup window and integrate with parent page | 3              | Show popup window  
Integration with Parent page  
Buttons - Save and Cancel functionality                                                                                                                                                                                                                                                                                                       |
| 10   | Login Page       | Login Page                               | 2              | Login page creation  
XA-RM integration (Credentials validation)                                                                                                                                                                                                                                                                                                    |
| 11   | Issuer Selection page | Issuer Selection page                  | 2              | Issuer selection page creation  
XA-RM integration (Rights mgmt)                                                                                                                                                                                                                                                                                                              |
Estimation Guidelines

- Estimate (hours) = No. of story points * 7.5
  - arrived based on historical data

- Adjusted estimate = Estimate * (1 + drag factor)
  - Drag factor is determined by the
    - duration of project,
    - knowledge of technology
    - knowledge of domain

- Distributed team
  - Adjusted estimate = Adjusted Estimate * 1.4

- Collocated team
  - Adjusted estimate = Adjusted Estimate * 0.6

<table>
<thead>
<tr>
<th>Drag</th>
<th># of years together</th>
<th>Knowledge of technology</th>
<th>Knowledge of domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>&lt; 3 months</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>0.75</td>
<td>&lt; 3 months</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>0.7</td>
<td>&lt; 3 months</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>0.75</td>
<td>&lt; 3 months</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>0.5</td>
<td>&lt; 3 months</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>0.5</td>
<td>&lt; 3 months</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>0.75</td>
<td>&lt; 3 months</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>0.5</td>
<td>&lt; 3 months</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>0.35</td>
<td>&lt; 3 months</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>0.6</td>
<td>&lt; 1 year</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>0.55</td>
<td>&lt; 1 year</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>0.5</td>
<td>&lt; 1 year</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>0.55</td>
<td>&lt; 1 year</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>0.3</td>
<td>&lt; 1 year</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>0.25</td>
<td>&lt; 1 year</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>0.5</td>
<td>&lt; 1 year</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>0.25</td>
<td>&lt; 1 year</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>0.2</td>
<td>&lt; 1 year</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>0.5</td>
<td>&gt; 1 year</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>0.45</td>
<td>&gt; 1 year</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>0.4</td>
<td>&gt; 1 year</td>
<td>Low</td>
<td>High</td>
</tr>
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<td>0.2</td>
<td>&gt; 1 year</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>
Benefits realized after Agile implementation

▶ The developer has **correctly understood** the requirement

▶ For integrating the product with other applications **issues surfaced well in advance** to take appropriate action

▶ The team could **focus on packaging the working version by continuous integration** of the different elements resulting in almost zero integration issues.

▶ Because of small work packages, we could adopt the approach **fail quickly but re-orient faster** which resulted in early detection and correction of defects resulting faster and smoother project delivery.

▶ The development team could **focus on value-add** rather than on the technical improvement

▶ The team could adopt a **proactive approach** rather than working in the reactive mode, which was very well appreciated by the customer.
The gains

### Improvement in KPI’s (Defect Density & % Rework) after Agile implementation

<table>
<thead>
<tr>
<th></th>
<th>Total Efforts (Person Days)</th>
<th>No. Of Defects</th>
<th>Rework Effort (Person Days)</th>
<th>Defect Density</th>
<th>% Rework (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Agile</td>
<td>1200</td>
<td>145</td>
<td>216</td>
<td>0.121</td>
<td>11%</td>
</tr>
<tr>
<td>Implementation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Agile</td>
<td>250</td>
<td>10</td>
<td>8</td>
<td>0.040</td>
<td>3.2%</td>
</tr>
<tr>
<td>Implementation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The benefits of Agile implementation with the customized agile process is clearly visible with reduction in Defect densities and % Rework along with improvement in Productivity.

Meeting or Exceeding customer expectations.
A survey was conducted to understand the benefits that the team realizes after implementation of Agile. Team has been asked to rate each statement on 5 point scale.

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication has improved</td>
<td>4.53</td>
</tr>
<tr>
<td>2</td>
<td>Encourage collaborative approach</td>
<td>4.32</td>
</tr>
<tr>
<td>3</td>
<td>Provides early warning of the problems</td>
<td>4.00</td>
</tr>
<tr>
<td>4</td>
<td>Increased Knowledge Sharing</td>
<td>3.95</td>
</tr>
<tr>
<td>5</td>
<td>Customer is happy</td>
<td>3.89</td>
</tr>
<tr>
<td>6</td>
<td>Team morale has increased</td>
<td>3.79</td>
</tr>
<tr>
<td>7</td>
<td>Team motivation has increased</td>
<td>3.74</td>
</tr>
<tr>
<td>8</td>
<td>Productivity has improved</td>
<td>3.74</td>
</tr>
<tr>
<td>9</td>
<td>Development is faster</td>
<td>3.63</td>
</tr>
<tr>
<td>10</td>
<td>Frequent deliveries increased team pressure</td>
<td>3.65</td>
</tr>
<tr>
<td>11</td>
<td>Helped to bypass certain process steps to speed up delivery</td>
<td>3.58</td>
</tr>
<tr>
<td>12</td>
<td>Defects has reduced</td>
<td>3.47</td>
</tr>
<tr>
<td>13</td>
<td>Overall delivery time has reduced</td>
<td>3.47</td>
</tr>
<tr>
<td>14</td>
<td>Requirements Gathering is faster and easier</td>
<td>3.42</td>
</tr>
<tr>
<td>15</td>
<td>Overheads are reduced</td>
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<tr>
<td>16</td>
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<td>17</td>
<td>Project management efforts has increased due to small sprints</td>
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<td>21</td>
<td>Testing time is reduced</td>
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<tr>
<td>22</td>
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</tr>
<tr>
<td>23</td>
<td>Rework has increased - as customer is not very clear about the ideas</td>
<td>2.68</td>
</tr>
<tr>
<td>24</td>
<td>Not suitable for Large and complex development projects</td>
<td>2.47</td>
</tr>
</tbody>
</table>
The team feedback

The team agreed that agile implementation has improved communication, encouraged collaborative approach and helped to make customer happy.

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Totally disagree</th>
<th>Disagree</th>
<th>No comments</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
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The development teams morale has improved, knowledge sharing became easy, making the team more productive and increased speed of deliveries.

The agile process helped the team to bypass certain process steps that were mandatory in waterfall model, reducing overall delivery time.

On the negative side, the team felt that frequent deliveries in agile process has increased team pressure.
The team feedback

May 2014

The team agreed approach and helped to make customer happy.

The team did not strongly agree that requirements gathering is simpler and easier. Although the data shows that % rework has reduced, qualitatively the team does not feel the same. The estimation model defined is yet to completely stabilize. Not all team members is aware of the estimation model.

Attrition is still a concern, adoption of Agile methodology has not helped to reduce the attrition. In some cases, rework has increased and customer are not very sure about the requirements, however overall % rework has reduced. The rework could have been much more without implementation of Agile methodology.

<table>
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Conclusion

- In IT industry, Agile implementation has resulted in mixed result. The cautious customized Agile methodology implementation approach adopted in Atos; adhering to CMMi model, provides a tailor made process that suits the project needs.
- Agile and CMMi should co-exist. The project will gain a lot of value over long term when Agile and CMMI synergies.
- The customized approach has not only resulted in improved project KPI’s and customer satisfaction but also helped the team to address challenge of using distributed team with debuts.
- The feedback from the team confirms that the customized Agile methodology helped the team to perform better even though the team has significant number of debuts and is geographically distributed.
- The blended approach of Implementation of Agile and CMMi is now published as a Global Process in Atos. Any team following the Global Agile process will automatically gets benefits of both; CMMi & Agile approaches.
Thank you

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