Agile is Eaten – But not yet Digested
Challenge: ACES and Fast Growth of Complexity

Agile must scale for **real industry needs**: Business, organization, process, technology
Vector Agile Solutions

Vector Supports Agile Projects Worldwide

**Agile principles and elements**
- Scrum teams
- Time-boxed sprints
- Continuous integration
- Epics, user stories
- Backlog, kanban
- Focus
- Human centered
- Simplicity

**Vector projects**
- Automotive OEM, e.g. Daimler, Ford
- Automotive Tier-1, e.g. Bosch, Schaeffler, ZF
- Non-automotive, e.g. ABB, Festo, Thales

**The dimensions of scaling**
- How to tailor?
  - Business
- How to scale?
  - Organization
  - Process
- Further scaling?
  - Technology

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Vector Benchmark: Agile AUTOSAR Production

Competitive Advantages with OEM-relevant features

Serviceability
- Innovative business models for OEMs
- App activation
- Feature updates
- Cybersecurity

Standardized SW and tools
- From implementation to configuration
- Standard tool chain (Component Development Kit, CDK) for several hundred developers with Gerrit, Git, Jenkins
- Component-Compatibility-Check (CCC) allows automatic test with each commit
- AUTOSAR tool-based code generation and dependency modeling
- Standardized BSW gives better quality
## Agile Frameworks Have Different Focus and Applicability

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Scrum of Scrums (SoS)</th>
<th>Scaled Agile Framework (SAFe)</th>
<th>Large Scale Scrum (LeSS)</th>
<th>Disciplined Agile Delivery (DAD)</th>
<th>Vector ACE (Agile for Critical Engineering)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope</strong></td>
<td>SW, HW and Systems, flexible</td>
<td>Software</td>
<td>Software</td>
<td>Software</td>
<td>SW, HW and Systems</td>
</tr>
<tr>
<td><strong>Differentiator</strong></td>
<td>Scrum for all situations and scales</td>
<td>Complex with many artifacts, roles, guidelines</td>
<td>Flexibility by using only suggestions</td>
<td>Complex and coverage of many models</td>
<td>Critical systems</td>
</tr>
<tr>
<td><strong>Underlying Technology</strong></td>
<td>Scrum</td>
<td>Scrum and other agile principles, Lean</td>
<td>Scrum</td>
<td>Scrum / Lean</td>
<td>Scrum / Lean</td>
</tr>
<tr>
<td><strong>Adoption</strong></td>
<td>Used in a large number of companies</td>
<td>Used in several companies</td>
<td>Used in several companies</td>
<td>Usage has started</td>
<td>Usage has started</td>
</tr>
<tr>
<td><strong>Scaling</strong></td>
<td>Flexible, simple and suitable to different settings</td>
<td>Targets large companies, but perceived as heavy</td>
<td>Can be adapted to different settings</td>
<td>Can be adapted to different settings</td>
<td>Can be adapted to different settings, incl. safety and E/E HW/mechanics</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Global teams</strong></td>
<td>Feasible</td>
<td>Feasible</td>
<td>Feasible</td>
<td>Feasible</td>
<td>Feasible</td>
</tr>
</tbody>
</table>
Case Study (1/4): Continuous Safety and Security

Scaling agile

- “Me-too” time-to-market < 2 years
- Coverage of safety and security
- High perceived quality
- Integration of strategic Tier-1s
- Compliance with standards

Agile for critical systems

- Higher level scope
- Design scope
- Deductive analyses (FTA)
- Inductive analysis (FMEA)
- Requirements
- Design for dependability
- Continuous Safety and Security

Agile results

- Lean yet systematic methods for dependability
- Prevention of design failures
- Fast development of models, inherent evidence of models
- Integral approach for safety and security
- Integrity, maintainability by modelling in PREEvision

Focus: Avoid effect of failures

Concepts and implementation of dependability

Continuous Integration

Mechanisms of dependability

Deductive thinking

Model-based
Traceability from changes based on hierarchic modelling, analysis and tests
Case Study (3/4): Adequate Tool Support

Scenario: Perceived “small change” leads to negative impact on safety and security
Challenge: Continuous impact analysis and consistency

**Approach: “Continuous” Safety Case**

Based on **effect chain analysis** the related tasks for safety analysis update can be identified (e.g. are safety related operations affected by change)

Tooling is mandatory for efficient and consistent change handling.

**PREEvision** provides here complete consistency

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**PLM toolchain (e.g. PREEvision)** has big impact on agile success in critical systems
Hierarchic agile teams ensure consistency, also for safety, security etc.
Lessons Learned and Look Ahead: Agile Scaling is Necessary – Yet not Easy

- Agile must be tailored and scaled according to the specific environment
- Heavy recipe-style frameworks do not address automotive needs
- With optimized agile tailoring the overall efficiency will increase significantly
- Managing change for organization and culture is biggest challenge

50% of agile transformations fail. Need for professional change management. Contact Vector.
Thank you for your attention.
For more information please contact us.


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