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Empowering Silicon Valley Teams to Shorten Delivery Timelines of Complex Systems by Applying Continuous Validation Methods

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Quick Intro
Consulting services by industry experts

- Covering the entire V Cycle
- Process design and improvement
- Strategy, Implementation and Integration support
Most issues and corner cases in the field are integration problems
The challenge

- Even with a well designed system architecture there will be corner cases missing

- So...
- How to detect integration problems in the field?
- How to react to problems found?
An answer

- Implement a smart system to harvest data from your fleet and run alert algorithms
  - (not the content of this session)

- Create a fully integrated end to end system integration regression test landscape
End to End Test Automation

• To achieve real end to end test automation the entire chain has to be in place
• Different levels of integration may have different solutions for each step
• The interfaces (gray arrows) have to be clearly defined and binding to all levels
• The best hardware and software solution for each level can be implemented

• Specification tool and Reports are recommended to be the same for all levels
Examples of Requirement Management Options:

<table>
<thead>
<tr>
<th>Of the shelf</th>
<th>Frequently used (but not recommended)</th>
<th>Other approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Rational DOORS</td>
<td>Word / PowerPoint / Excel</td>
<td>git</td>
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<tr>
<td>Polarion</td>
<td>Confluence</td>
<td>“product as spec”</td>
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<td>Jama Contur</td>
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**End to End Test Automation**

- **Specify**
- **Schedule**
- **Execute**
- **Evaluate**
- **Report**

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**Examples of Test Specification**

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<td>TestRail</td>
<td>Source Code</td>
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<td>XRAY</td>
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End to End Test Automation

Examples of Scheduling Options:
• Human
• CI Server
End to End Test Automation

Examples of Execution Options:
- Manual
- Test Stand
- LabView
- AutomationDesk
- RobotFramework
- CANoe
Examples of Evaluation Options:
- Manual
- Most automated execution options have (limited) evaluation capabilities
Examples of Reporting Options:
- Within test management tools
- E-mail subscription
- Dashboard Examples:
  - Grafana
  - Kibana
  - Tableau
  - Plotly
Continuous Validation

Successful continuous validation is empowered by two key methodologies:

• Minimum change content from one test execution to the next
• Distributed test coverage throughout the integration levels and builds
Branching Strategy needed for Continuous Validation:

- **Master Branch** under active development, new features are committed.
- Continuously sync’d feature branch.
- **Branch under active Development**, new features are committed.
- **Branch under active Validation**, no new features, only bugfixes are committed.
- **Customer branch**, code stable and frozen, only opened for hotfix.
Regression run coverage

Smart distribution

V- cycle

System

Subsystem

Component

Coordinated execution provides fully validated builds on system level plus additional coverage on subsystem and component level.
Conclusion

• Integrate your tool chain end to end
• Run validation as often as possible
• Synchronize all levels of validation
• Keep change content as small as possible