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Virtualization of ECU-Compound Test – An Agile Journey

Dr. Chen Ma | Volkswagen AG
Virtualization of ECU Compound Test – An Agile Journey

Outline

1 | Motivation & Background

2 | Challenges & Proposals

3 | Agile Collaboration
Virtualization of ECU Compound Test – An Agile Journey

1 | Motivation & Background

- Challenges in the automotive industry
- SimLAB and its context
- Virtualization of ECU compound test
- Introduction of the project
Virtualization of ECU Compound Test – An Agile Journey
1 | Motivation & Background – Challenges in the Automotive Industry

Holistic complexity of car functions
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1 | Motivation & Background – Virtualization of ECU Compound Test

Complex car functions need to be regarded in their wholeness
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1 | Motivation & Background – Challenges in the Automotive Industry

Example 1: Car2Car Communication

Example 2: Automated Driving

Virtualization is the only affordable way to solve the challenges
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1 | Motivation & Background – SimLAB and its Context

Using virtualization as a key-technology to make complex functions testable – early and efficiently
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1 | Motivation & Background – SimLAB and its Context

Creating a self-contained eco-system for virtual validation and development
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Development timeline

Start

Test & Integration

SOP
Virtualization of ECU Compound Test – An Agile Journey
1 | Motivation & Background – Virtualization of ECU Compound Test

Where is the compound?
Where are the artifacts?

Development timeline

Start

SOP
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Development timeline
Virtualization of ECU Compound Test – An Agile Journey

1 | Motivation & Background – Virtualization of ECU Compound Test

Development timeline

Start

SOP
Virtualization of ECU Compound Test – An Agile Journey
1 | Motivation & Background – Introduction G-SiL

Virtualization of the G-HiL

Virtual complete vehicle test

Virtualized test objects
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1 | Motivation & Background – V-ECU Concept in G-SiL

Vertical integration

Frontloading

Scalable complete vehicle integration test

Hardware Abstraction Layer (HAL) is the driver layer and the single software component which is hardware dependent.
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1 | Motivation & Background – G-SiL Application

- Function-oriented virtual test
- Wholeness of the functional compound
- „Close to reality“
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1 | Motivation & Background – G-SiL Contribution
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2 | Challenges & Proposals

- New kind of “virtualizable” test objects
- Industry-wide standards
- Synergetic objectives
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2 | Challenges & Proposals

Challenge 1:
New kind of “virtualizable” test objects required from suppliers

Software component as new unit for delivery
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2 | Challenges & Proposals

Challenge 2:
Industry-wide standards for virtualizable components required

Extension of AUTOSAR Standard to V-ECU
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2 | Challenges & Proposals

Challenge 3:
Synergetic objectives across departments, divisions and companies required

Sharing integration platform and models
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2 | Challenges & Proposals

New way of cooperation on all levels and in all directions required!
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3 | Agile Collaboration

- Agile Values
- SimLAB Setup
- Experience & Benefit
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3 | Agile Collaboration – Agile Values

Focus on customer value
Open exchange
Where is a will, there is a way
Think big, welcome failure, welcome resistance
Every opinion counts

Focus
Openness
Commitment
Courage
Respect
Virtualization of ECU Compound Test – An Agile Journey
3 | Agile Collaboration – SimLAB Setup

Product Owner
- Thinks entrepreneurically
  "What does the company need?"

Development Team
- Thinks in concrete solutions
  "How can I implement this?"

Scrum Master
- Thinks value-creating
  "How can I support the team?"

Contact person and proactive interface to customers, users and stakeholders

Developer & Testcenter
- Improves the efficiency of Scrum in the organization
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3 | Agile Collaboration – Experience & Benefit

Transparency
leads to acceleration of progress on both sides

Synergy
leads to innovation that each side cannot achieve alone but needs urgently
Synergy is the new energy.