methodpark

Trends in Automotive Software Engineering

a Challenge for OEMs and Suppliers

Stages insights
Fürth, 14.03.2018

Prof. Dr. Bernd Hindel
CEO Method Park

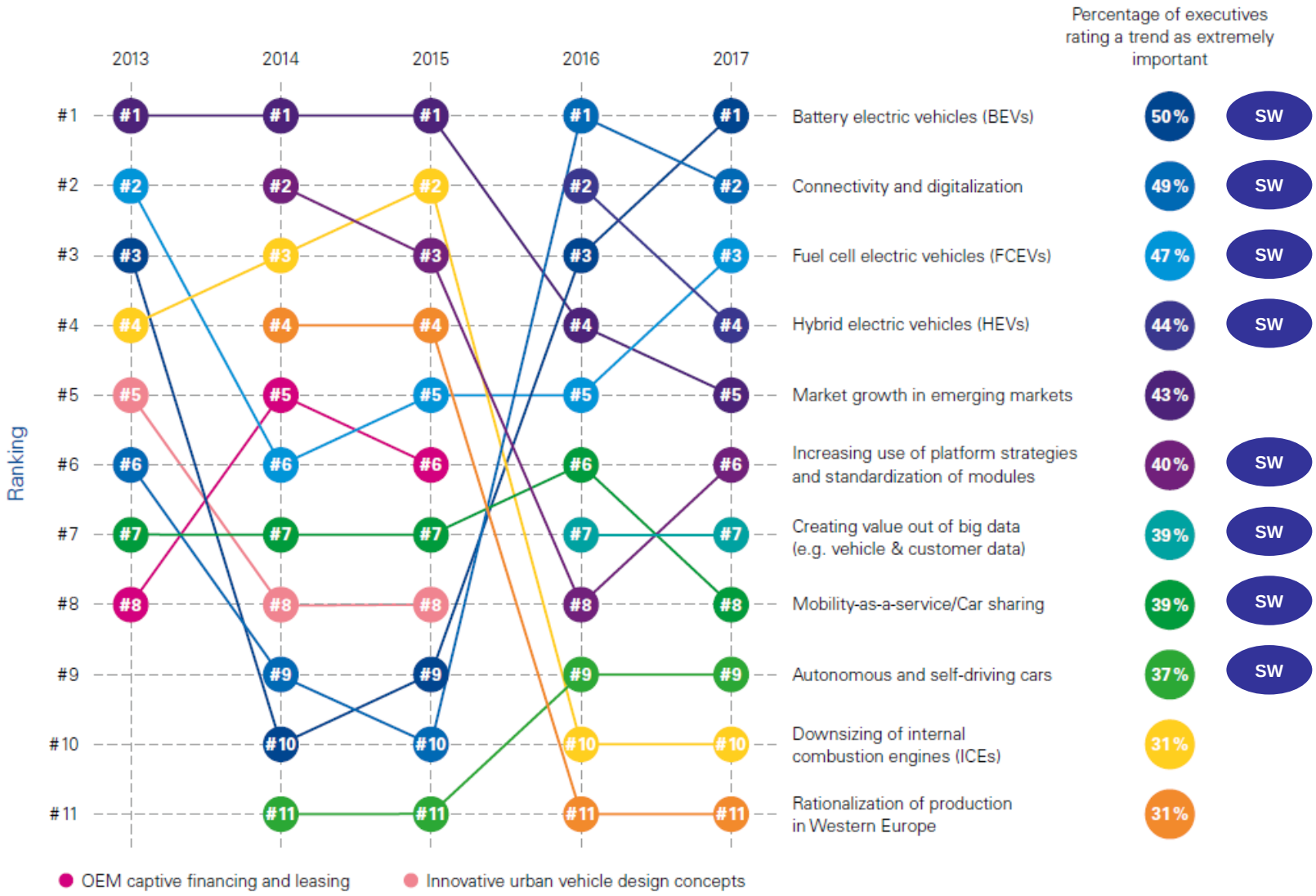
Agenda

- **Trends in Automotive**
- Observation and Motivation
- Trends in Automotive SW Engineering
- Core Principles of ASPICE
- Summary

© 2018 www.methodpark.de

Trends in Automotive

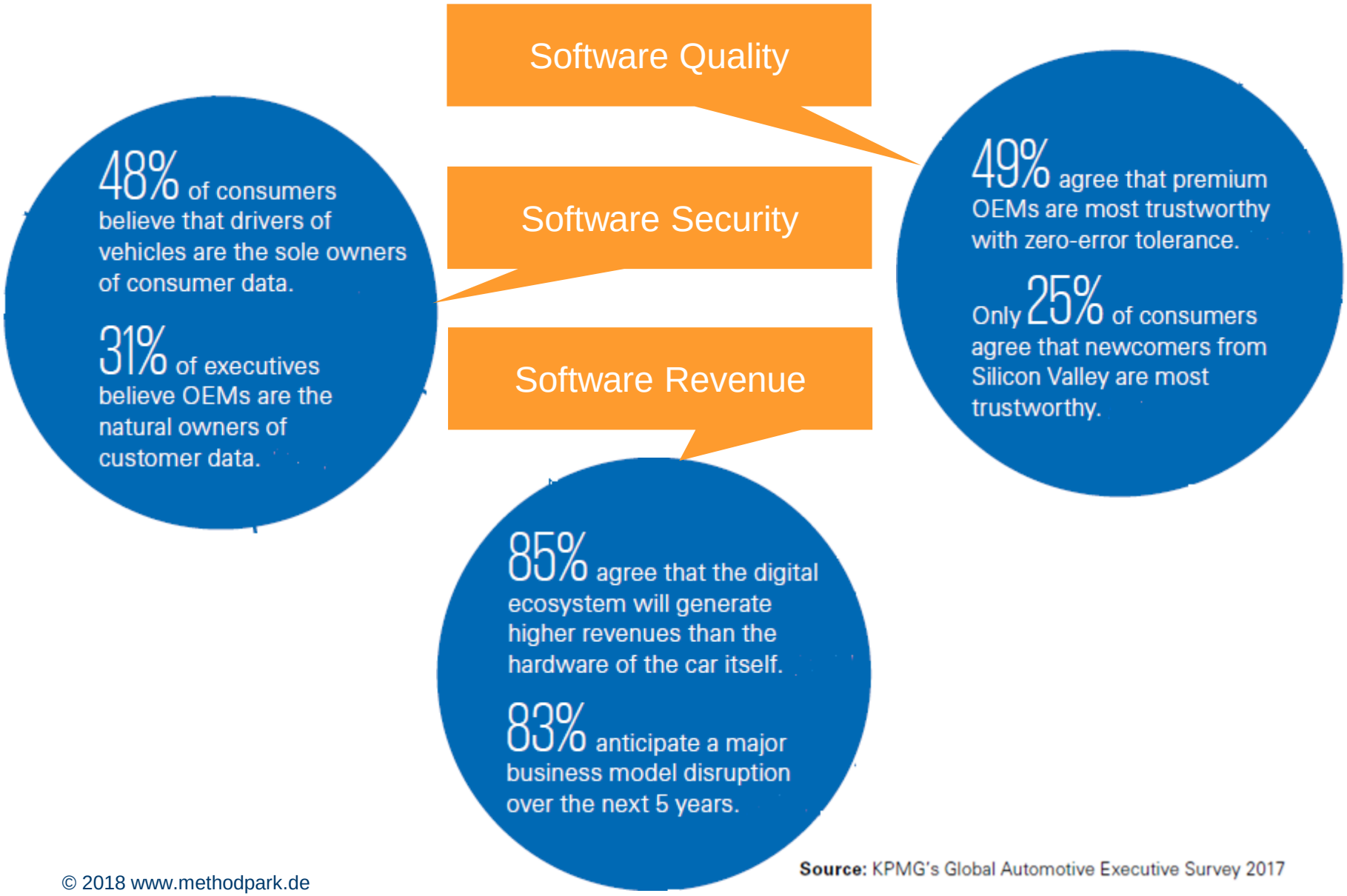
methodpark



Source: KPMG's Global Automotive Executive Survey 2017

Trends in Automotive

methodpark



Source: KPMG's Global Automotive Executive Survey 2017

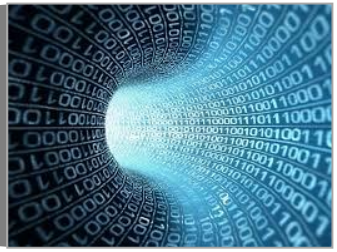
© 2018 www.methodpark.de

Trends in Automotive

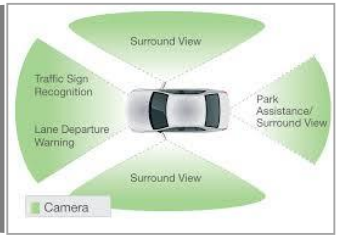
methodpark

- Man-Machine-Interface

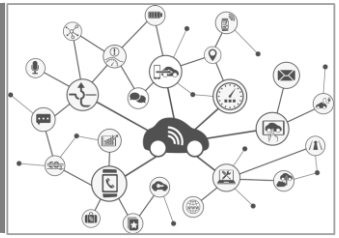
- BIG DATA



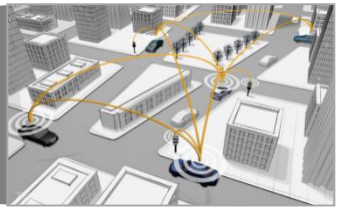
- ADAS



- Connected Car



- Autonomous Driving



© 2018 www.methodpark.de

Agenda

- Trends in Automotive
- **Observation and Motivation**
- Trends in Automotive SW Engineering
- Core Principles of ASPICE
- Summary

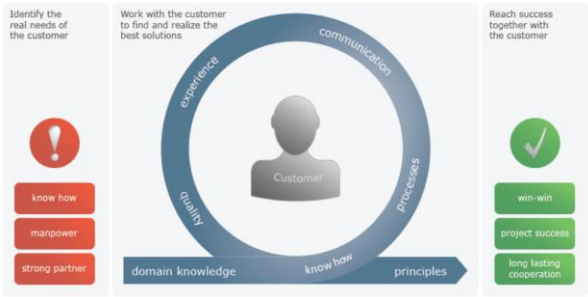
© 2018 www.methodpark.de

Observation and Motivation

methodpark

New Business Models

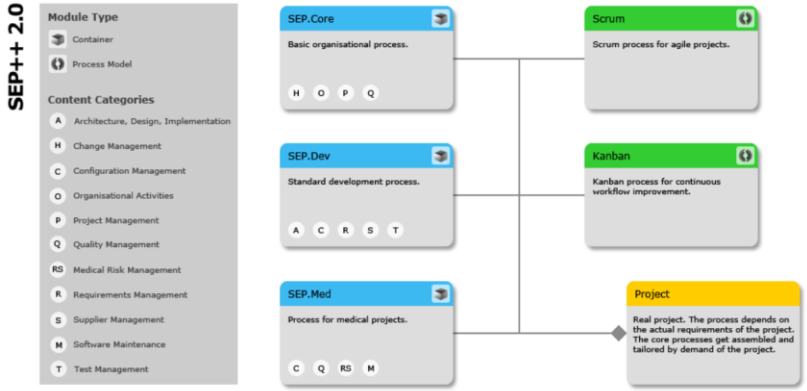
New Tooling



New Suppliers

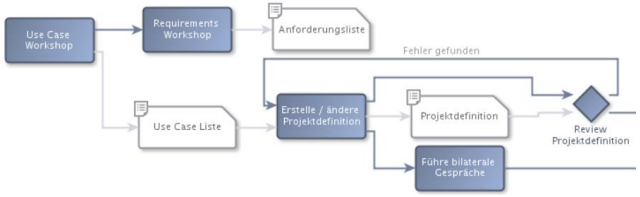
Biggest Transformation since we build cars

New Technologies



New Development Culture

New Standards



New Processes

Agenda

- Trends in Automotive
- Observation and Motivation
- **Trends in Automotive SW Engineering**
- Core Principles of ASPICE
- Summary

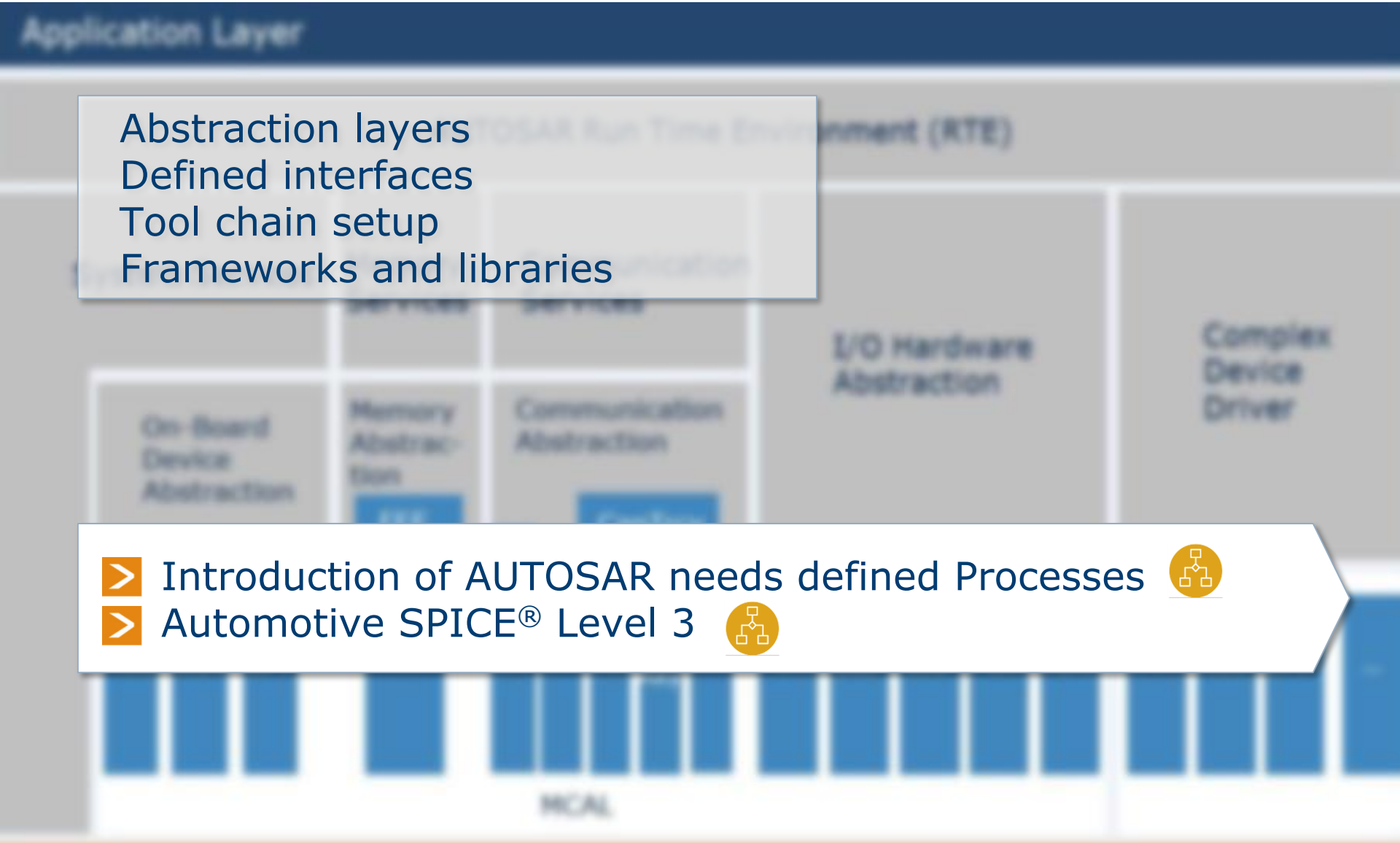
© 2018 www.methodpark.de

Complexity

methodpark

Increasing functionality
Interaction between ECUs
Increasing number of variants
Dependencies between features

- Application Life Cycle Management
- SW Development Processes
- Product Line Engineering
- AUTOSAR



- Abstraction layers
- Defined interfaces
- Tool chain setup
- Frameworks and libraries

- Introduction of AUTOSAR needs defined Processes
- Automotive SPICE® Level 3

© 2018 www.methodpark.de

Product Line Engineering (PLE)

methodpark

- Features sets
- Re-use concepts
- Platform strategies
- Configuration management

- Introduction of PLE needs a defined Process
- Automotive SPICE® Level 3

Safety

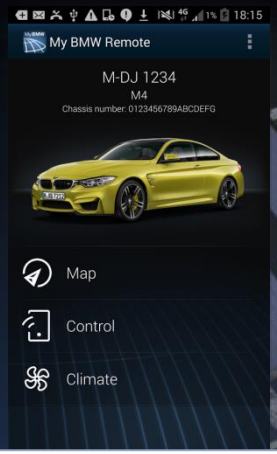
methodpark

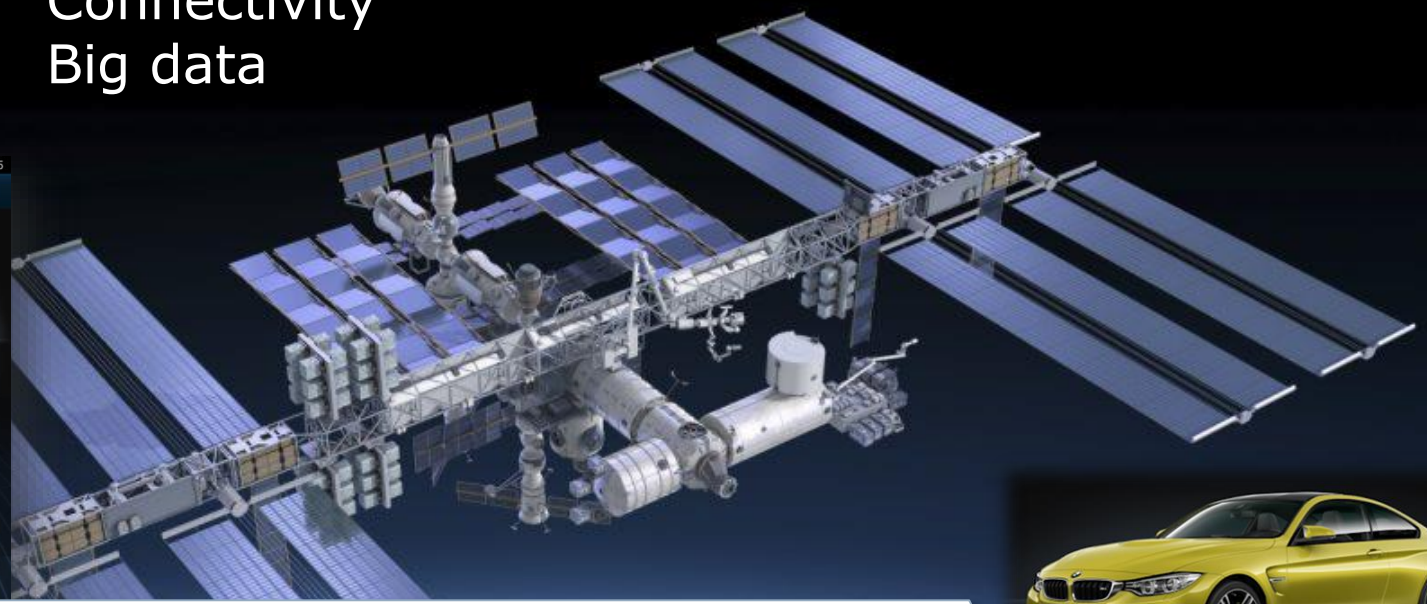
ADAS
Autonomous Driving
Fail Safe Strategies
Safety Culture during Development

- ISO26262 or a remake of it
- Automotive SPICE® Level 3

Security

Remote control (Internet of things)
Car2car communication
Connectivity
Big data





- Security standard driven by automotive
- Automotive SPICE® Level 3

© 2018 www.methodpark.de

Distributed Development

methodpark

Common terminology across company boarders
Distributed planning
Agreed work products
Monitoring concept

- Automotive SPICE® Level 3
- KPI for monitoring

© 2018 www.methodpark.de

Traditional vs. Agile

methodpark

Traditional

- Plan driven
- Typical V-Model
- Trouble with changes
- Big Bang – Integrations

Agile Methods

- *Value driven*
- *Welcome late changes*
- *Continuous integration*
- *Sprints with fixed timelines*

- Combination of Traditional & Agile Methods
- Automotive SPICE® Level 3

Challenges in Automotive SW Engineering

methodpark

- AUTOSAR
- ISO26262 (++)
- Security Standard for Automotive
- Automotive SPICE® Level 3

Agenda

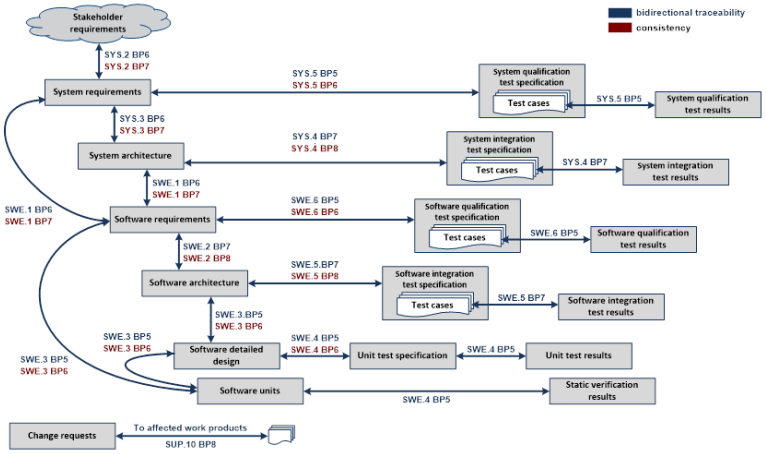
- Trends in Automotive
- Observation and Motivation
- Trends in Automotive SW Engineering
- **Core Principles of ASPICE**
- Summary

© 2018 www.methodpark.de

Core Principles of ASPICE

Level 1

- Bilateral traceability including Change Requests
- Consistency of traceability
- Evaluation of architectures and designs
- Strategies become plans



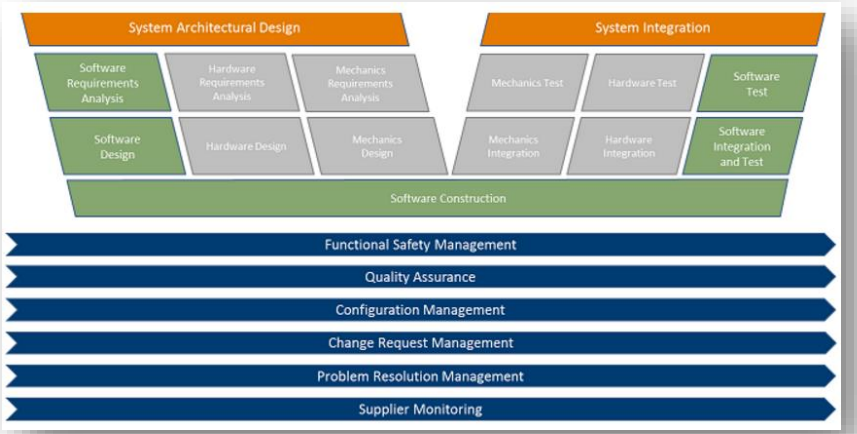
Level 2

- Objectives for improvements, planning, monitoring and adjusting
- Define and assign roles including skill needs and competencies
- Establish communication to involved parties
- Define and use templates and checklists
- Conduct Reviews
- Establish Configuration Management

© 2018 www.methodpark.de

Level 3

- Define a standard process including
  - tailoring guidelines
  - roles
  - infrastructure
  - measures for suitability and effectiveness
- Use the tailored standard process



© 2018 www.methodpark.de

After more than 15 Years of ASPICE

methodpark

there is Harmonization
across Company Boarders in

- Common Terminology
- Common Practices
- Common Work Products
- Common Maturity

… AUTOMOTIVE SPICE® supports distributed Development across Company Boarders

- Automotive SPICE® Level 3

© 2018 www.methodpark.de

Agenda

- Trends in Automotive
- Observation and Motivation
- Trends in Automotive SW Engineering
- Core Principles of ASPICE
- **Summary**

© 2018 www.methodpark.de

Summary

- Higher complexity asks for higher abstraction:

programming ➔ design ➔ processes

- ADAS, Security, Safety requires defined processes

Automotive SPICE Level 3

- Distributed Engineering needs Frame Works
  like AUTOSAR based on defined processes

Automotive SPICE Level 3

➔ Transformation of Engineering based on Process Management

stages **was build to support Automotive SPICE Level 3**

© 2018 www.methodpark.de

Summary

methodpark

New Business Models

New Tooling

New Suppliers

New Technologies

New Standards

New Development Culture

Biggest Transformation
since we build cars

Not without Process Management