methodpark

Abstraction Layers
for the rollout of
Automotive SPICE®

ASPICE in 6 / 12 / 18 months

Process Insights US
Rochester, October 1st , 2018

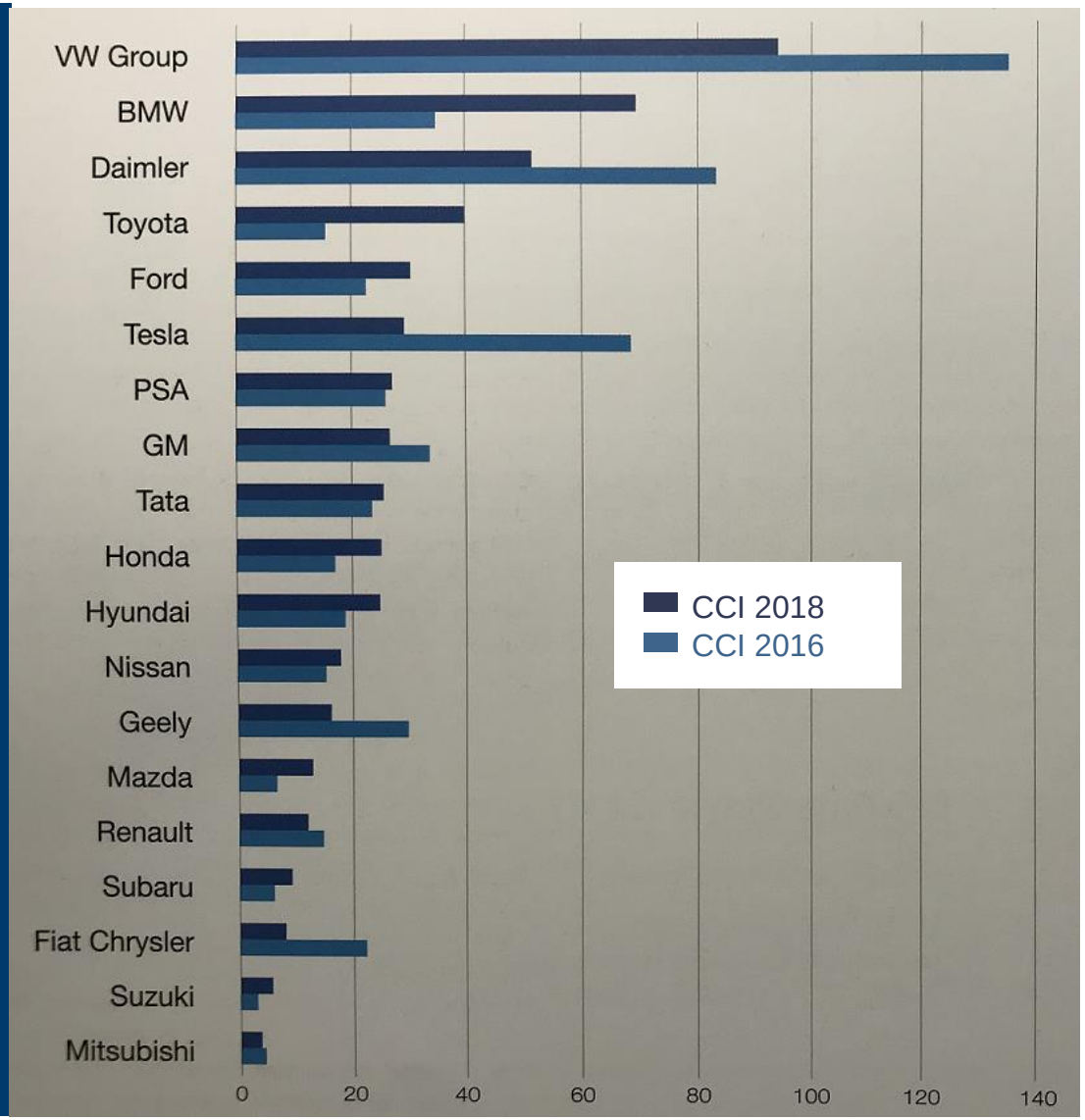
Prof. Dr. Bernd Hindel

Agenda

- **Motivation & Scenario**
- Core Principles of ASPICE
- Abstraction Layers of Engineering Processes
- ASPICE Rollout Plan
- Summary

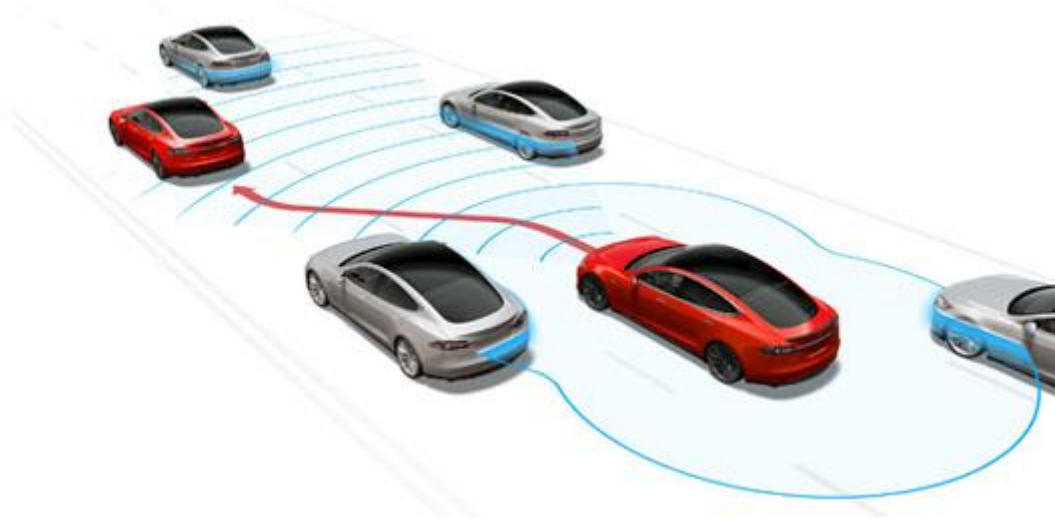
© 2018 www.methodpark.de

Motivation



CCI

Connected **C**ar **I**nnovations
based on the “Innovation Data Base”
of the “Center of Automotive Management”.
CCI includes ADAS and features for autonomous driving.

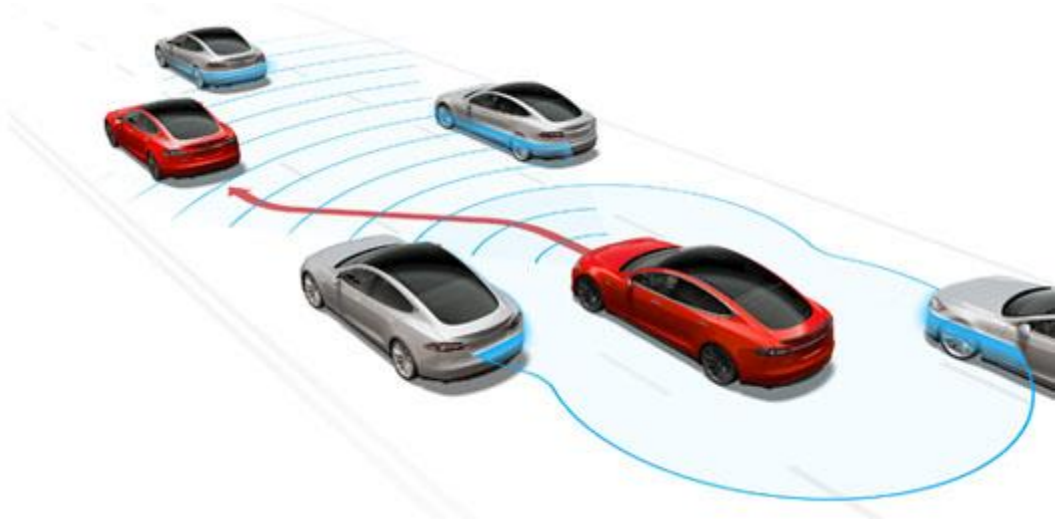


© 2018 www.methodpark.de

… most **Connected Car Innovations** require ISO26262

… ISO26262 requires Processes

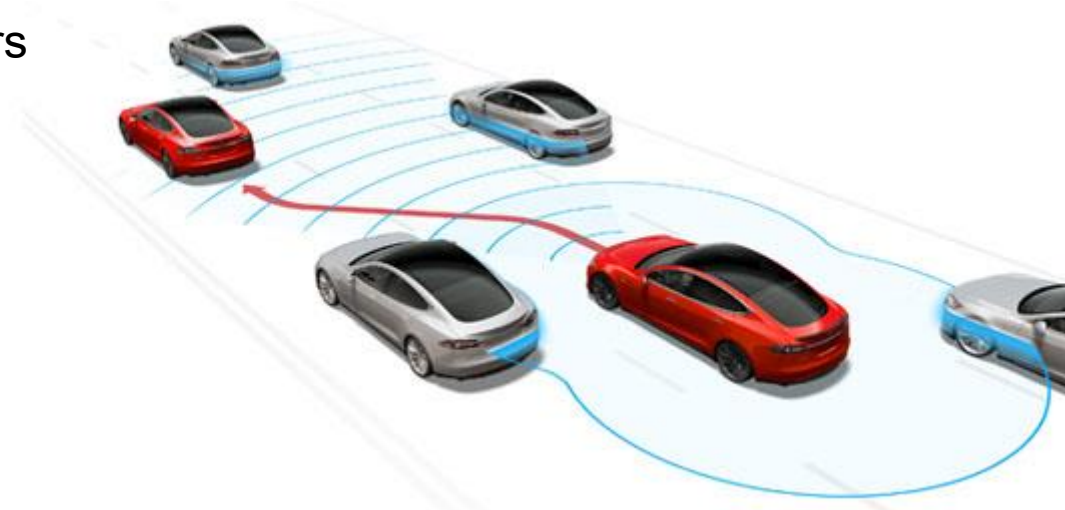
… Processes are defined & improved by **Automotive SPICE®**



© 2018 www.methodpark.de

… the **Automotive SPICE®** community is growing …

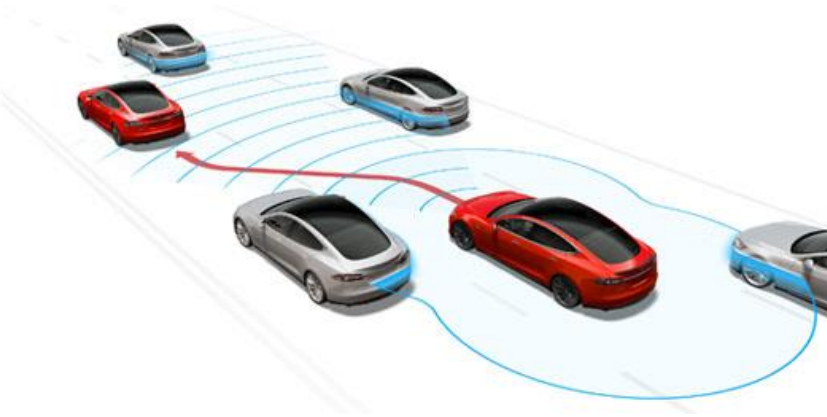
… and many others



© 2018 www.methodpark.de

methodpark

First Autonomous Inc. (FAI)



- develops cars for autonomous driving SAE Level 4
- the first model is called “*FITON*”
- sells ECUs for autonomous driving also to other OEMs

FAI has a standard development process for engineering.
The standard process

- defines milestones, quality gates and the reporting to corporate level
- also includes procedures, strategies and guidelines
- does not talk about tooling
- is given as a set of pdf documents

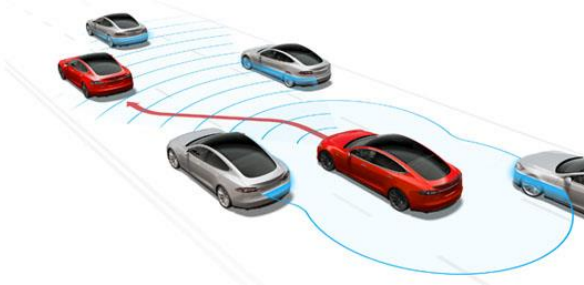
Interviews conducted in the Engineering Department of FAI show
that the engineers

- use up to date engineering tools
- do not know about the defined procedures, strategies and guidelines
- try to stick to the milestones, quality gates and implement the reporting to corporate level as defined

© 2018 www.methodpark.de

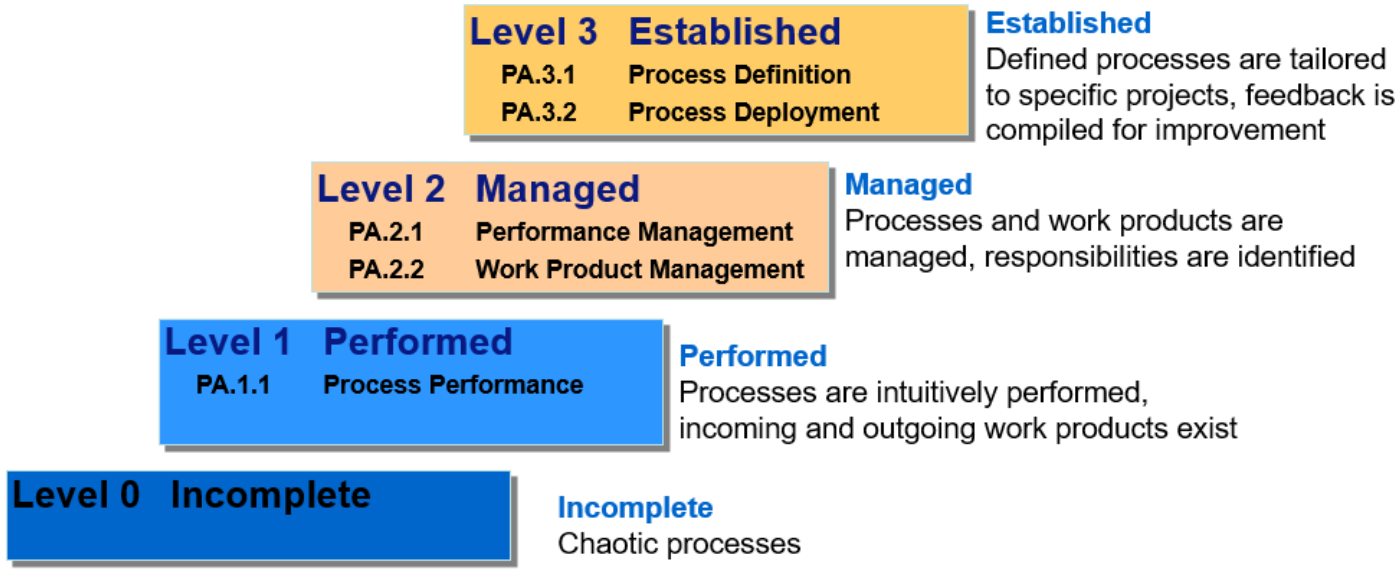
methodpark

First Autonomous Inc. (FAI)



- most of the development projects have to show compliance to ISO26262

- therefore FAI decided to implement Automotive SPICE® Level 3 to get ready for ISO26262



© 2018 www.methodpark.de

Agenda

- Motivation & Scenario
- **Core Principles of ASPICE**
- Abstraction Layers of Engineering Processes
- ASPICE Rollout Plan
- Summary

© 2018 www.methodpark.de

Core Principles of ASPICE

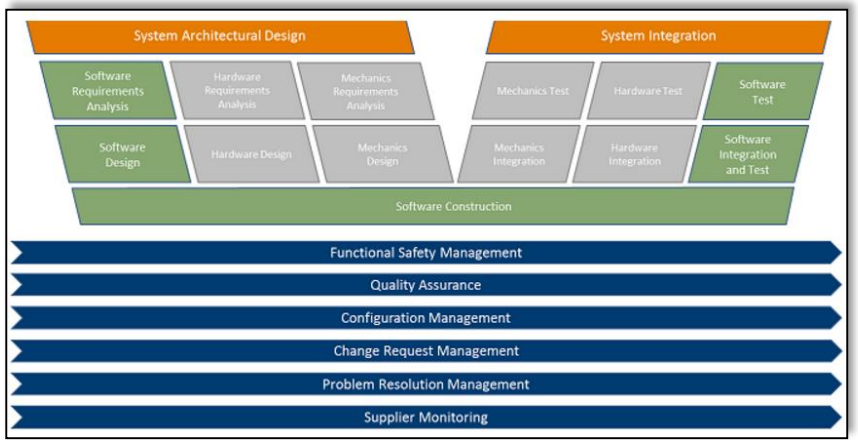
VDA QMC
Quality Management in the Automotive Industry

Automotive SPICE®
Process Reference Model
Process Assessment Model
Version 3.1

Title:	Automotive SPICE Process Assessment / Reference Model
Author(s):	VDA QMC Working Group 13 / Automotive SIG
Version:	3.1
Date:	2017-11-01
Status:	PUBLISHED
Confidentiality:	Public
Revision ID:	656

Maturity Models like Automotive SPICE®
define the "**WHAT**" (the goals):

What has to be achieved?
Which Practices have to be implemented?
Maturity Models are not Process Definitions!



Processes define the "**HOW**"
(the way how achieve the goals):

lifecycle models, tools, templates, methods, metrics, best practice, guidelines, strategies, procedures, roles & skills, tailoring guidelines, workflows, …

Remark: HOW includes WHO, WHEN, WHAT

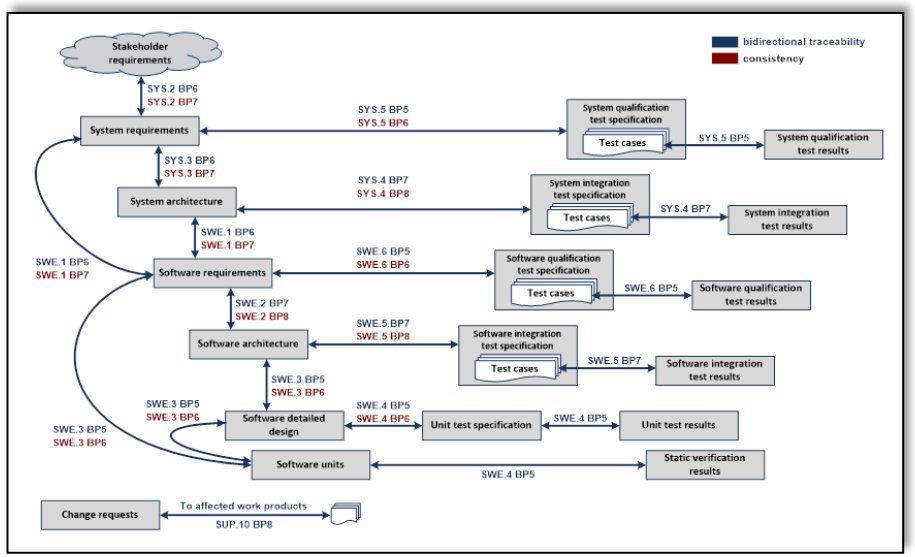
© 2018 www.methodpark.de

Core Principles of ASPICE

Level 1

- Bilateral traceability including Change Requests
- Consistency of traceability
- Evaluation of architectures and designs
- Plans based on Strategies

Level 1	Performed
PA.1.1	Process Performance



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

Level 2	Managed
PA.2.1	Performance Management
PA.2.2	Work Product Management

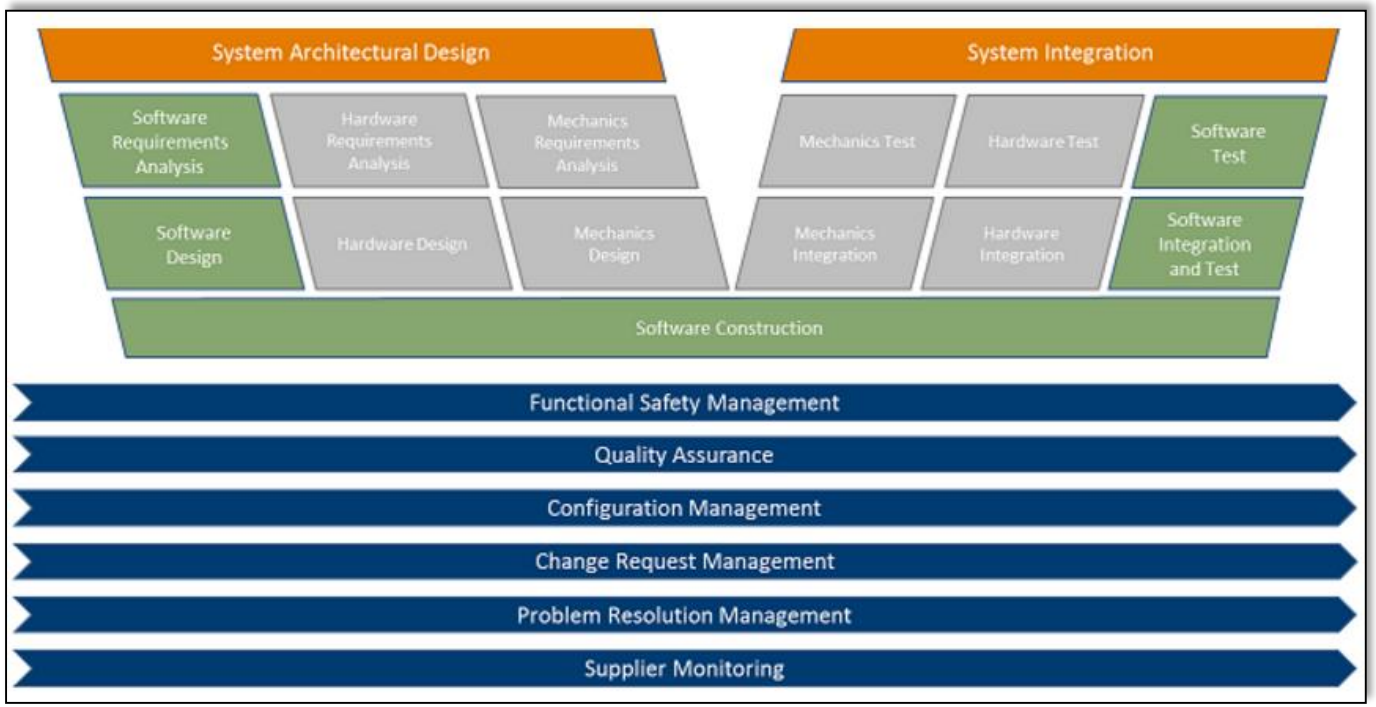
© 2018 www.methodpark.de

Core Principles of ASPICE

Level 3

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

Level 3	Established
PA.3.1	Process Definition
PA.3.2	Process Deployment



© 2018 www.methodpark.de

Agenda

- Motivation & Scenario
- Core Principles of ASPICE
- **Abstraction Layers of Engineering Processes**
- ASPICE Rollout Plan
- Summary

© 2018 www.methodpark.de

Abstraction Layers for Engineering Processes

Abstraction Layer	Process Elements	Compliance Mapping
Corporate	Milestones Quality Gates Corporate Reports	
Business Unit	V-Model Workflows(1) … for System Engineering … for HW Engineering … for SW Engineering Scrum Workflows	Process Standards i.e. Automotive SPICE®
Product Line	… additional activities … additional work products … additional roles Tooling Practices Guidelines for Tools Guidelines for Tailoring Templates Checklists	Product Standards i.e. ISO26262

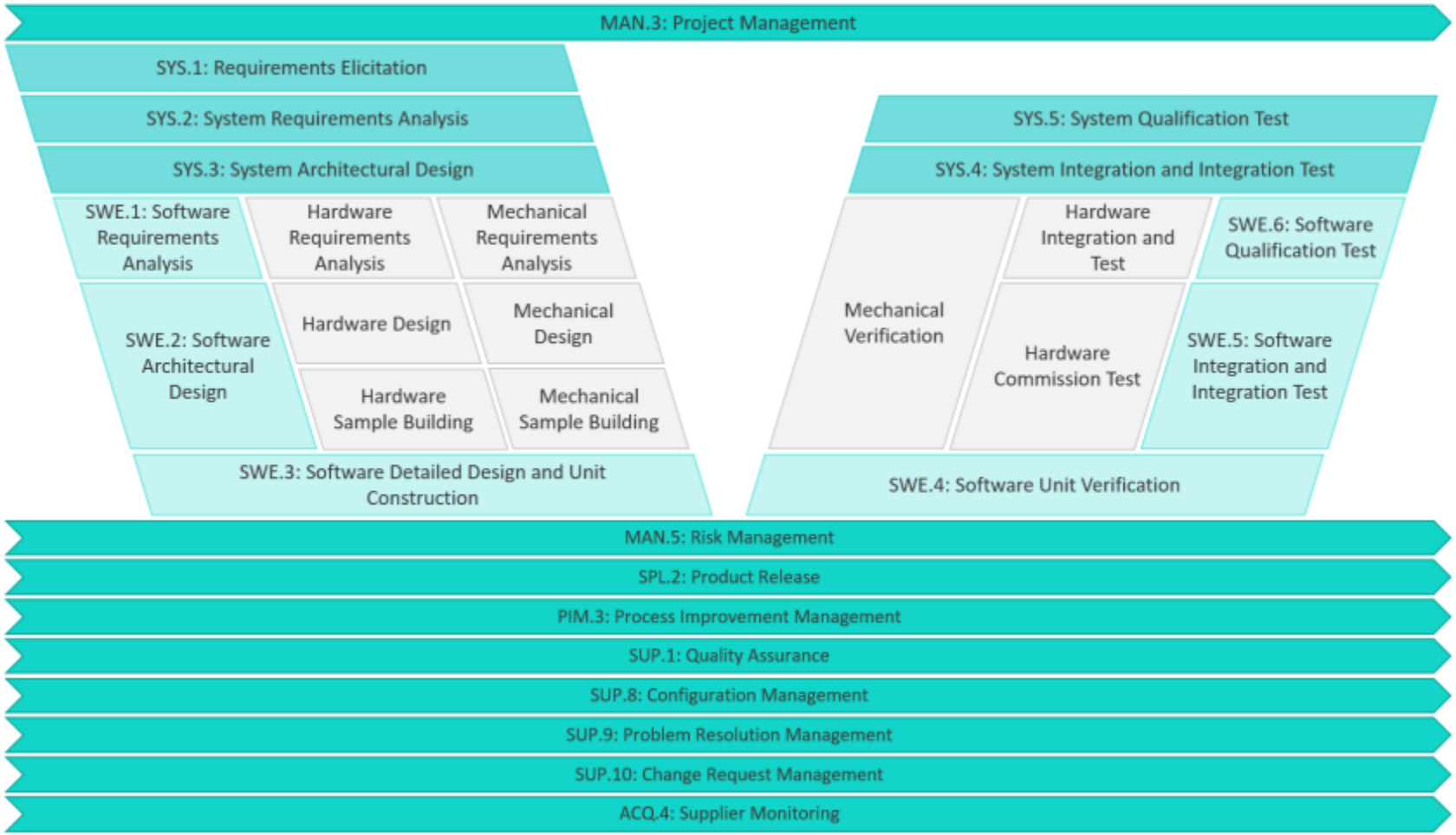
(1) Workflows defined by Activities, Work Products and Roles

© 2018 www.methodpark.de

Generic ASPICE Process

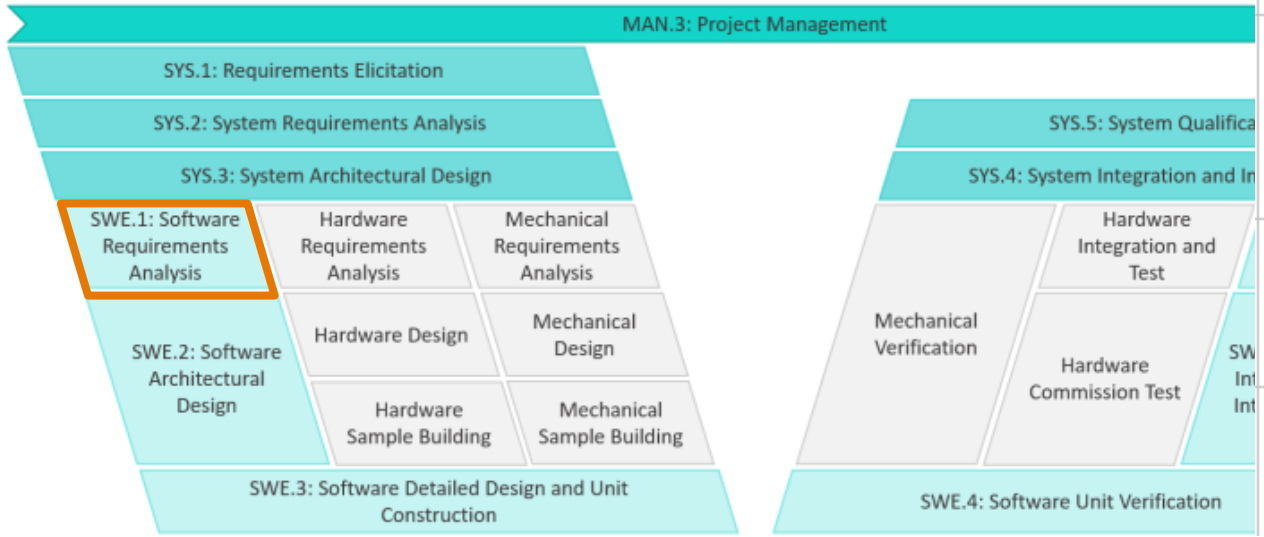
methodpark

… for Business Unit Layer compliant to Automotive SPICE®



© 2018 www.methodpark.de

Generic ASPICE Process



Roles

Responsible
- Software Requirements Engineer

[Change] [New]

Support
- System Architect
- Software Architect

[Change] [New]

Accountable
- Software Leader

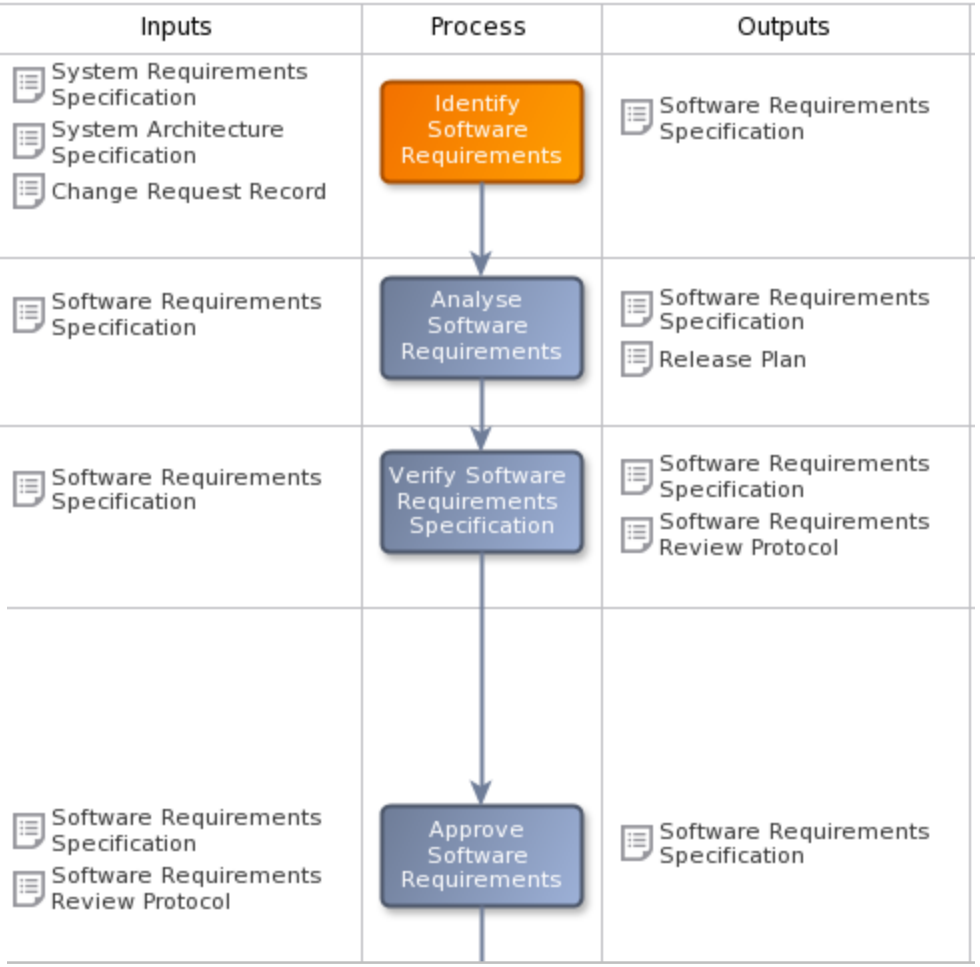
[Change] [New]

Informed
- Stakeholder

[Change] [New]

Consulted
- Software Test Engineer

[Change] [New]



Compliance

Reference mappings to Automotive SPICE 3.0:
- SWE: Software Engineering Process Group > SWE.1: Software Requirements Analysis > SWE.1.BP1: Specify software requirements [Outcome 1, 5, 7]
- SWE: Software Engineering Process Group > SWE.1: Software Requirements Analysis > SWE.1.BP6: Establish bidirectional traceability [Outcome 6]

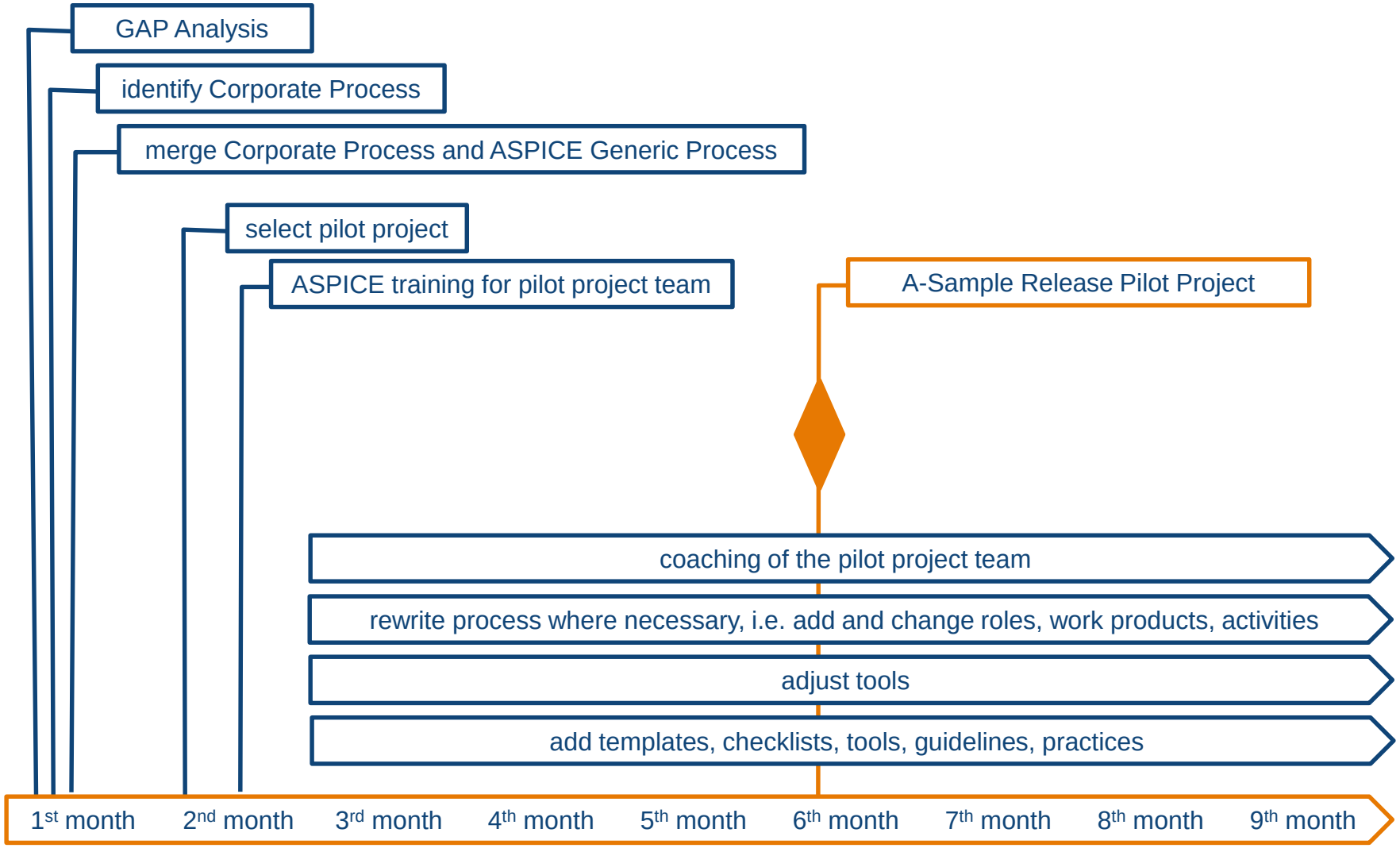
© 2018 www.methodpark.de

Agenda

- Motivation & Scenario
- Core Principles of ASPICE
- Abstraction Layers of Engineering Processes
- **ASPICE Rollout Plan**
- Summary

© 2018 www.methodpark.de

ASPICE Rollout Plan



Level 2 Managed

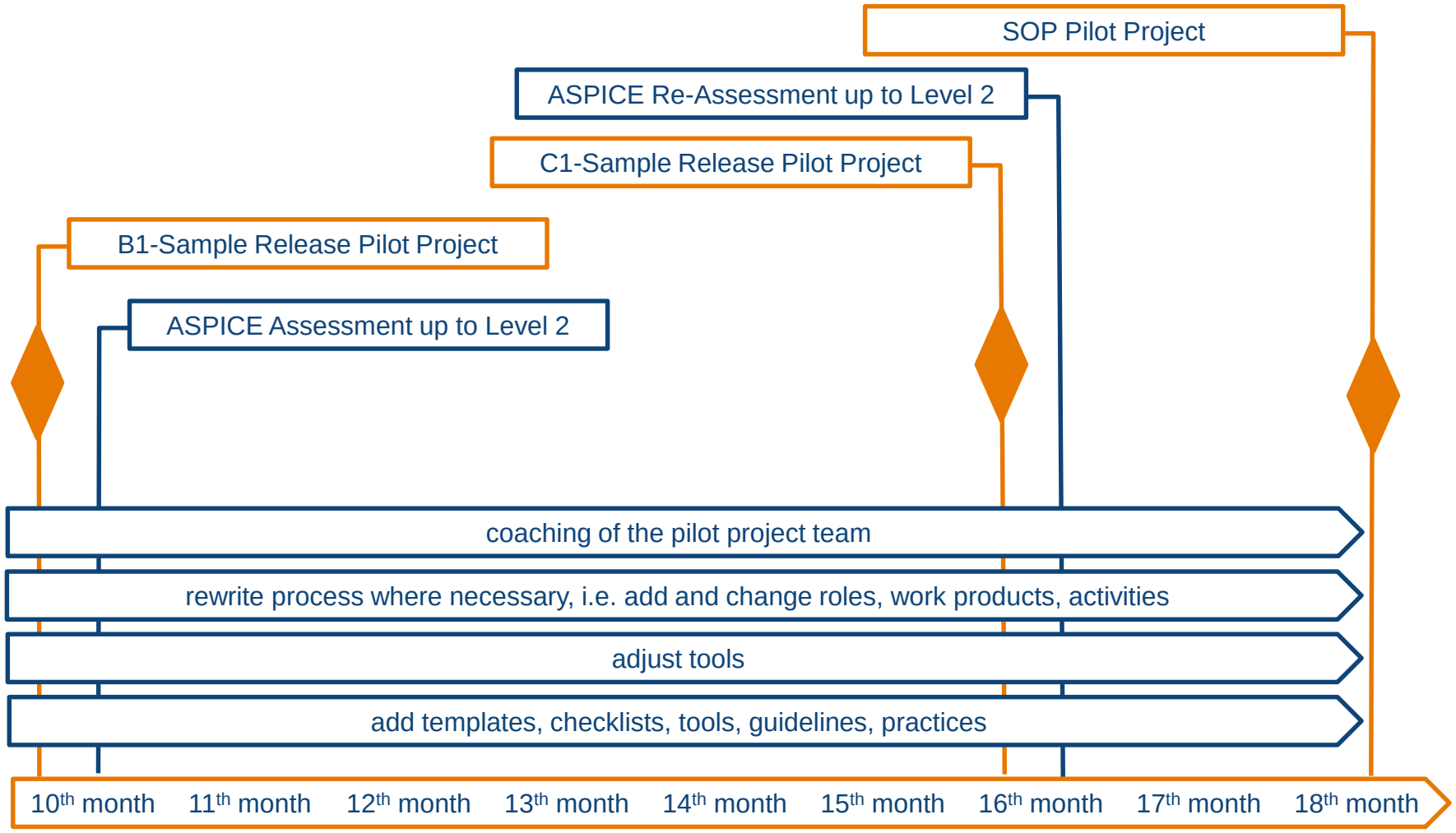
PA.2.1	Performance Management
PA.2.2	Work Product Management

Level 1 Performed

PA.1.1	Process Performance

© 2018 www.methodpark.de

ASPICE Rollout Plan



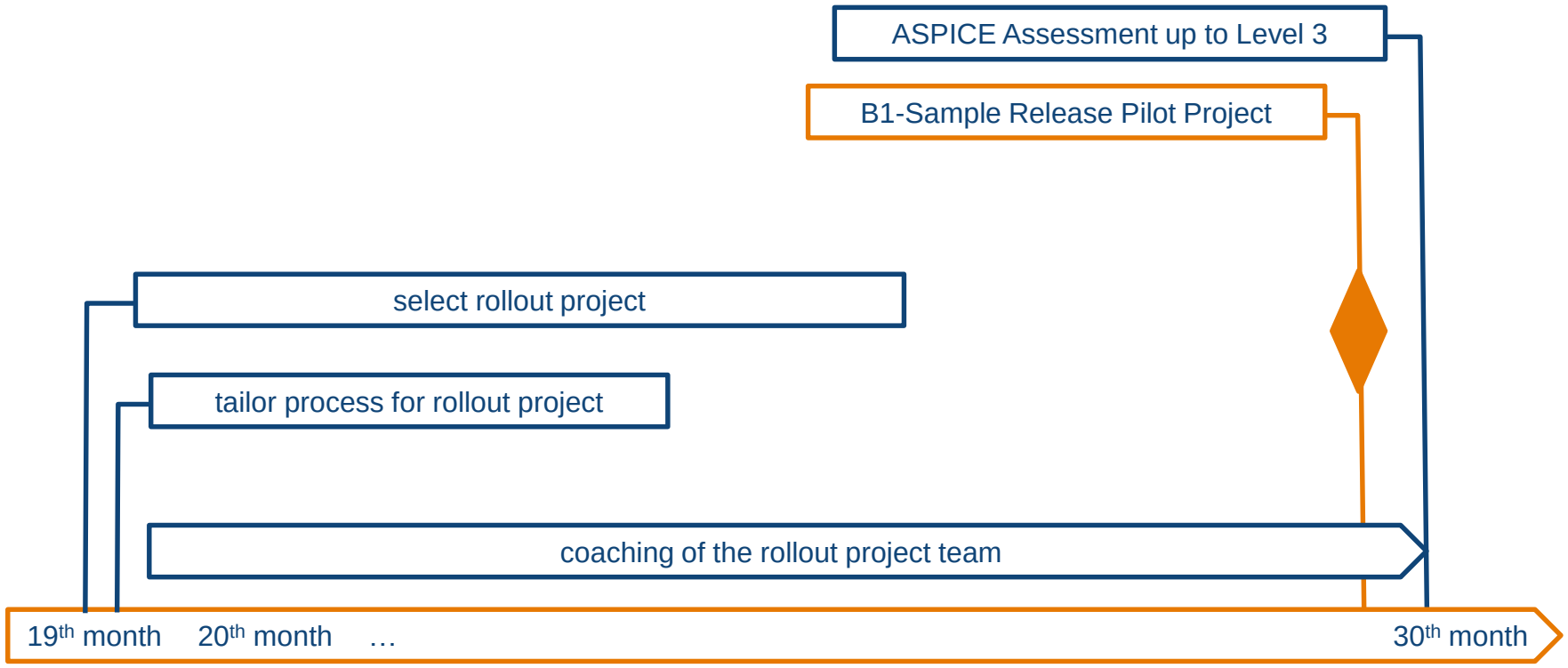
Level 3 Established
PA.3.1 Process Definition
PA.3.2 Process Deployment

Level 2 Managed
PA.2.1 Performance Management
PA.2.2 Work Product Management

Level 1 Performed
PA.1.1 Process Performance

© 2018 www.methodpark.de

ASPICE Rollout Plan



Level 3 Established
PA.3.1 Process Definition
PA.3.2 Process Deployment

Level 2 Managed
PA.2.1 Performance Management
PA.2.2 Work Product Management

Level 1 Performed
PA.1.1 Process Performance

© 2018 www.methodpark.de

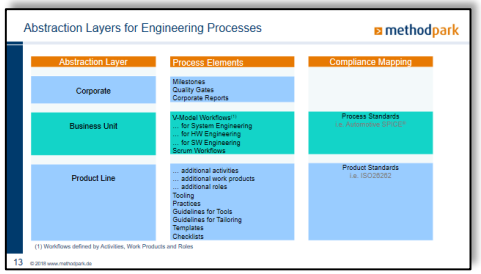
Agenda

- Motivation & Scenario
- Core Principles of ASPICE
- Abstraction Layers of Engineering Processes
- ASPICE Rollout Plan
- **Summary**

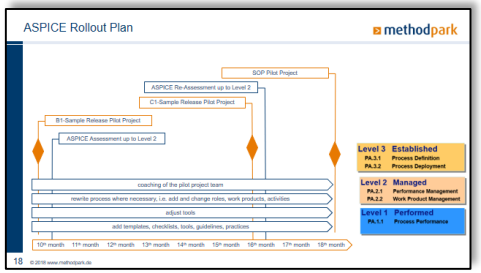
© 2018 www.methodpark.de

Summary

- There are 3 abstraction layers of processes.

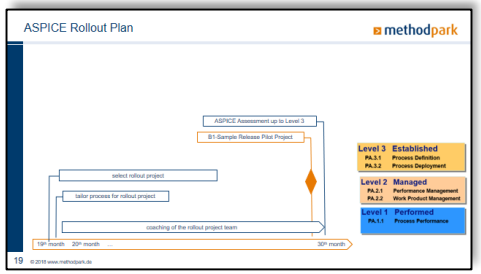


- The ASPICE compliance can be best established
  on activities and work products of the workflows
  on SYS-, HW-, SW-Engineering (Business Unit Level).



- The introduction of ASPICE is best done by adjusting
  a generic ASPICE process to the needs of a pilot project
  (tools, guidelines, practices, templates, checklists, …)

- Besides the GAP-Analysis at the beginning,
  there should be 2 ASPICE Level 2 Assessments for the pilot project
  (after B1-Sample & after C1-Sample)



- The ASPICE Level 3 ready process is defined throughtout the lifetime of the pilot project.
  The first level 3 Assessment will be conducted after B1-Sample of the first rollout project.

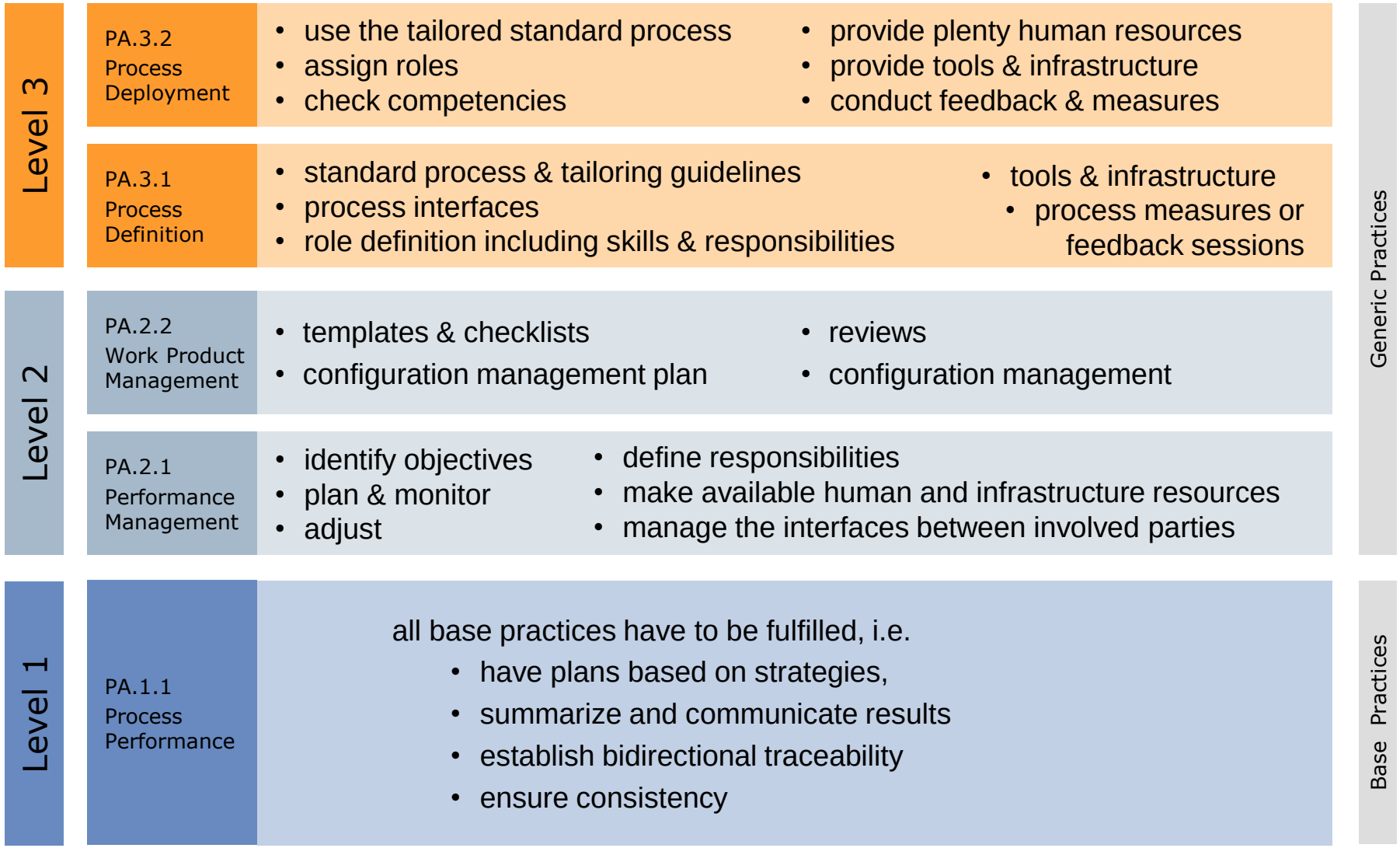
© 2018 www.methodpark.de

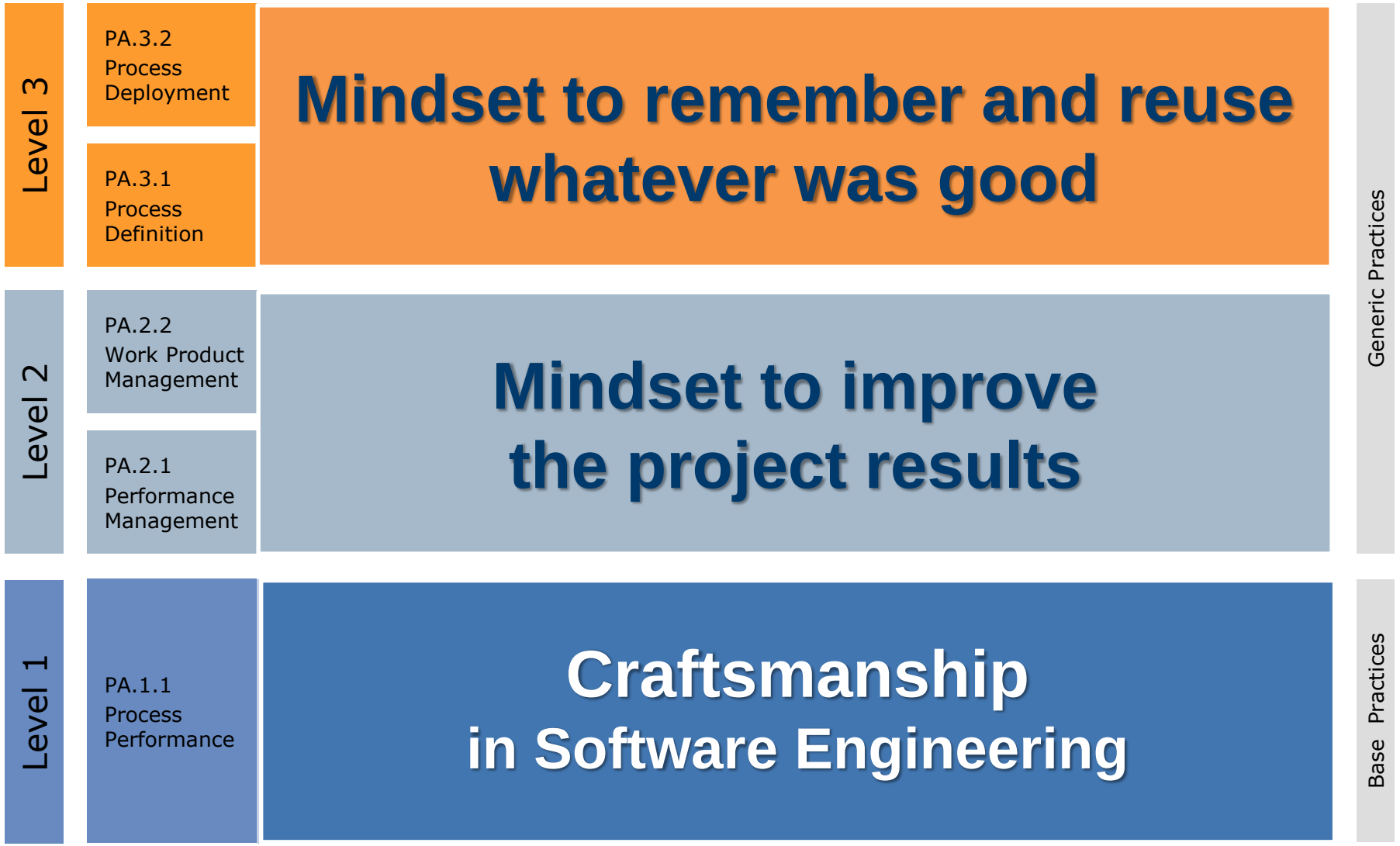
Thank you for your attention

© 2018 www.methodpark.de

ASPICE Summary Level 1 -3

methodpark



ASPICE Summary Level 1 -3

methodpark