VDA QMC Project Group 13
Status and Outlook to Automotive SPICE 4.0

Project Group 13

Agenda

Intro

Experiences and Observations from Assessments

Major Changes in the PAM V4.0

Roadmap

About Bhaskar Vanamali

- Married, 4 children
- Principal at Kugler Maag Cie
- Over 25 years of experience in industry and process improvement
- Assisting medium-size companies as well as international corporations, primarily in the automotive industry
- Very experienced trainer, moderator, and management coach
- Speaker at conferences and co-author of books

Qualification & Experience

- intacs™-certified Principal Assessor, SQIL (VW) and trainer, member of VDA PG13 (lead of sub-working group on ML), who
- conducted more than 160 assessments, many of them for OEMs
- trained more than 500 ISO/IEC 15504 provisional assessors from leading car manufactures (OEMs) and suppliers
- advised OEM representatives on the development of Automotive SPICE®
- Project leader of several change and improvement projects based on SPICE and CMM/CMMI®
- Providing consultancy, coaching, and active support in several ECU development projects in automotive
- Member of ISO-working group for system and SW-engineering processes, and ML standards

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The Team

- Members from OEMs, Tier 1 and Tier 2

- Optimal combination of experience plus fresh ideas

- Including assessors, instructors and process developers

- Antenori, Sandro (Continental)
- Becker, Martin (Volkswagen)
- Burstika, Tim (BMW)
- Dornseiff, Manfred (ZF)
- Engländer, Tino (Continental)
- Fehérvári, Attila (Saneon)
- Hamann, Dirk (Schaeffler)
- Klostermann, Marc (Infineon)

- Leonhardt, Barbara (Audi)
- Löschberger, Cornelia (Webasto)
- Mandic, Irenka (Magna)
- Metz, Pierre (Brose)
- Morenzin, Jan (VDA QMC)
- Müller-Ott, Teresa (VDA QMC)
- Ostermann, Martin (Ford)
- Schoelzke, Manfred (Opel)

- Topf, Michael (ZF)
- Vanamali, Bhaskar (KuglerMaag)
- Westerhoff, Volker (Hella)
- Wlokka, Albrecht (Bosch)
- Zimmer, Jörg (Mercedes)

In alphabetical order

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Observations and Experiences with the PAM v3.1 and Guidelines v1.0

Despite of great acceptance in worldwide community still some problems and misconceptions need to be addressed

- Reproducibility & comparability of assessment results have not improved

- Assessment duration increased

- Guideline content used as pure checklists

- Growing formalism instead of understanding the context

- Engineers in projects : frustration up – motivation down

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Examples that potentially influence assessment result reproducibility

- Are Notes normative or informative?

  NOTE 3: A release numbering implementation may include

  - *the major release number*

  - *the feature release number*

  - *the defect repair number*

  - *the alpha or beta release*

  - *the iteration within the alpha or beta release*

- Is it not useful to regard this as a checklist? Is this a complete list? What if one of these aspect is more important than others?

- Some assessors

  - may find it appropriate to downrate if one of these aspects is missing

  - say "Notes are informative. I check the numbering scheme for adequateness in the context of the project."

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Motivation for the PAM v4.0

- Achieve maximum repeatability & reproducibility of assessment results

- Improve assessment efficiency

- Reflect the current engineering state-of-the-art

- Address modern collaboration models

- Eliminate content redundancies

- Avoid misinterpretations

- Restructure the assessment model

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Major Changes in the PAM v4.0

Removed PAM v3.1 processes (11):

- ACQ.3   Contract Agreement
- ACQ.11   Technical Requirements
- ACQ.12   Legal and Administrative Requirements
- ACQ.13   Project Requirements
- ACQ.14   Request for Proposals
- ACQ.15   Supplier Qualification
- SUP.2   Verification
- SUP.4   Joint Review

- SUP.7   Documentation
- REU.2   Reuse Program Management
- SPL.1   Supplier Tendering

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Major Changes in the PAM v4.0

NEW Processes (15)

- HWE.1   Hardware Requirements Analysis*

- HWE.2   Hardware Design*

- HWE.3   Verification against Hardware Design*

- HWE.4   Verification against Hardware Requirements*

- MEE.1 – MEE.x Mechanical Engineering*

- MLE.1   Machine Learning Requirements Analysis

- MLE.2   Machine Learning Architectural Design

- MLE.3   Machine Learning Training

- MLE.4   Machine Learning Model Testing

- SUP.11   Data Management Machine Learning

- VAL.1   Validation

*) Taking the intacs^{TM}-developed models as the basis, courtesy of intacs^{TM}

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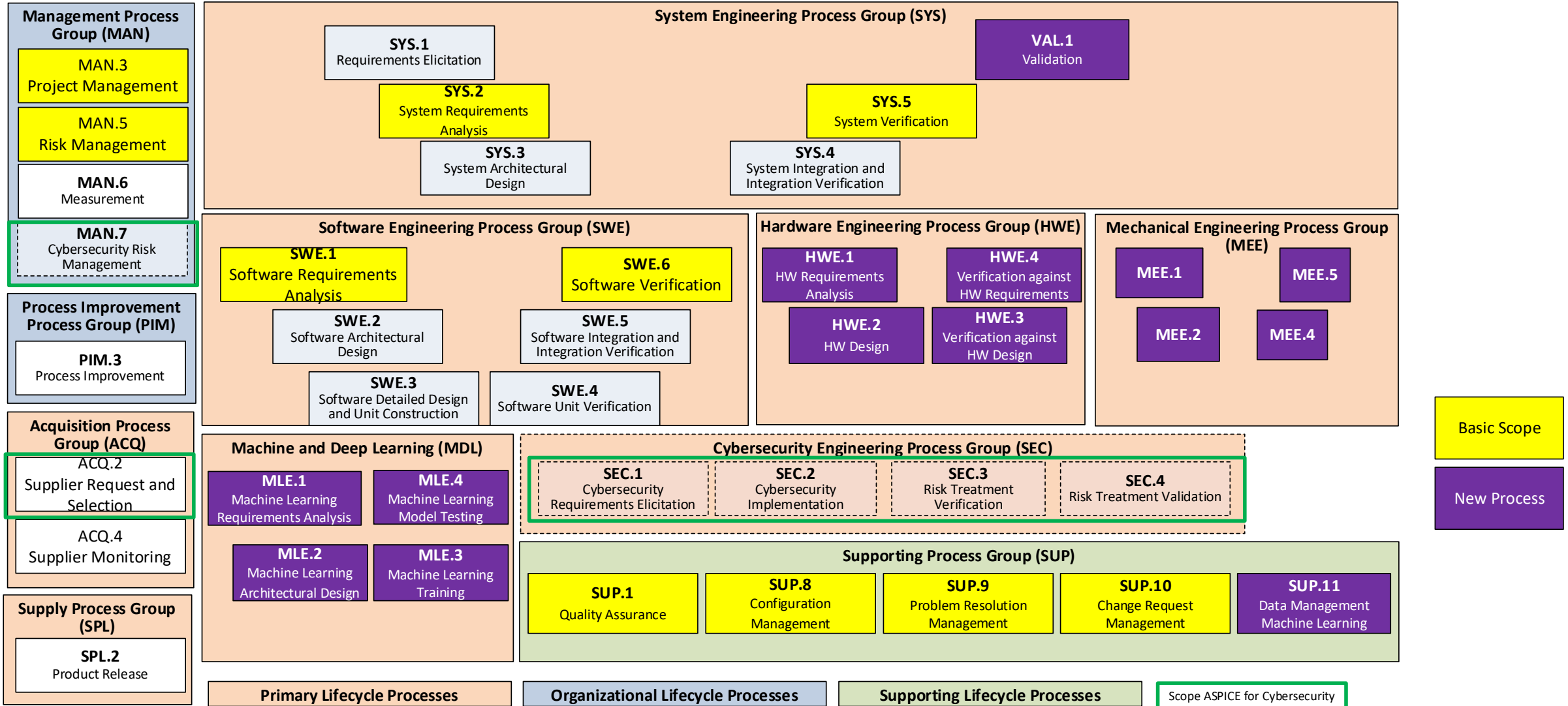Revised Processes:

- SPL.2   Product Release

- MAN.5   Risk Management

- ACQ.4   Supplier Monitoring

- REU.2   Reuse Management

Other processes are adapted according to new concepts and the measurement framework used.

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Major Changes in the PAM v4.0

Changed Concepts

- Separate PAM for 'Potential Analysis'

- Notes with implicit requirements or checklist-like enumerations will be revised or rephrased

- Planning-related aspects shifted completely to Level 2

- Restructuring of Level 3 GP (level semantics remain unchanged)

- Work product characteristic replaced with the ISO 33060 concept of 'Information Item Characteristic' (IIC)

- Extra tables for BP and IIC mappings to Process Outcomes

- Traceability BP re-integrated into the consistency BP

- New basic scope

What is Machine Learning? What can it do?

Give it a try. Face was generated by AI?

Challenges

Machine learning terminology
Basic machine learning concept

Real world problem /

Training

Model

Algorithm

Data
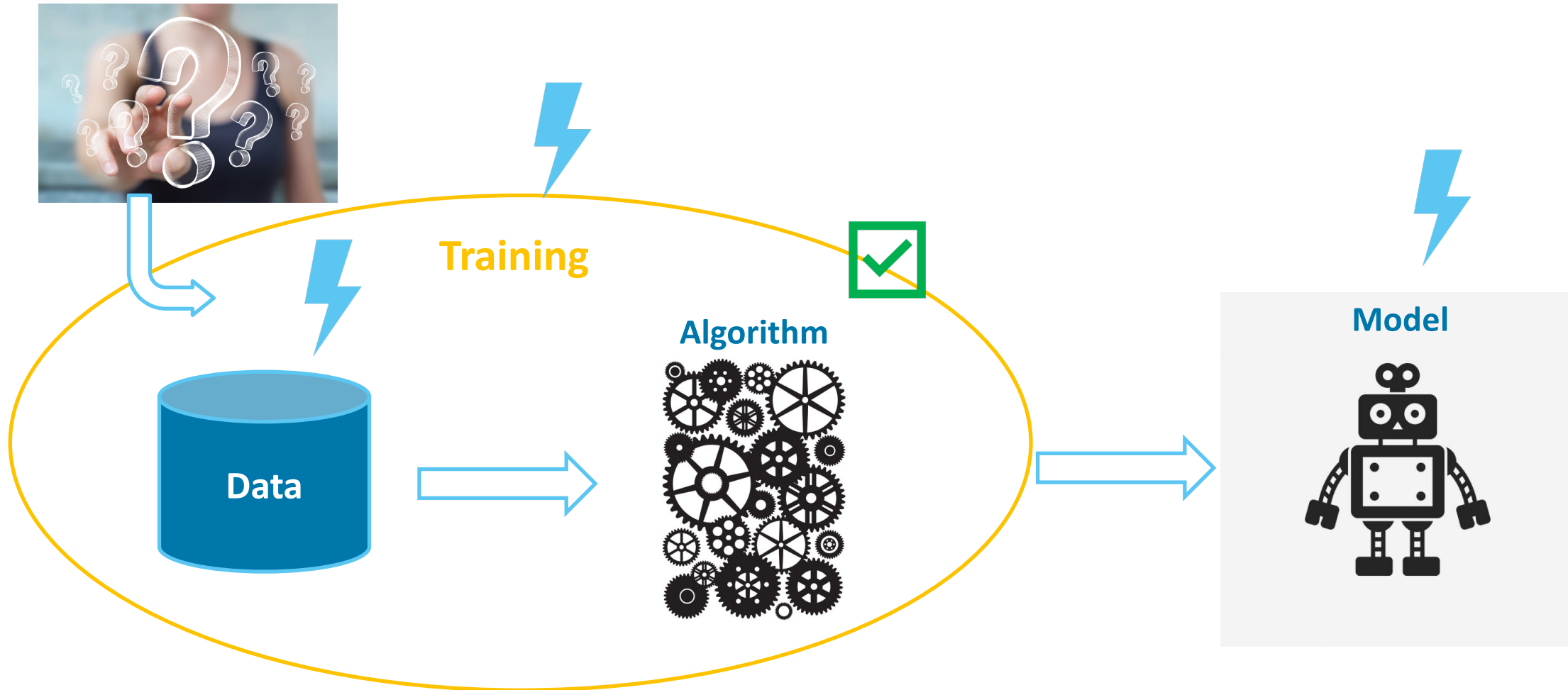
SPICE for Machine Learning
Concept

- Kugler Maag has process knowhow

- ML is affecting all aspects of automotive development

- We used support from an ML expert

- Lost in translation!

- The Onion
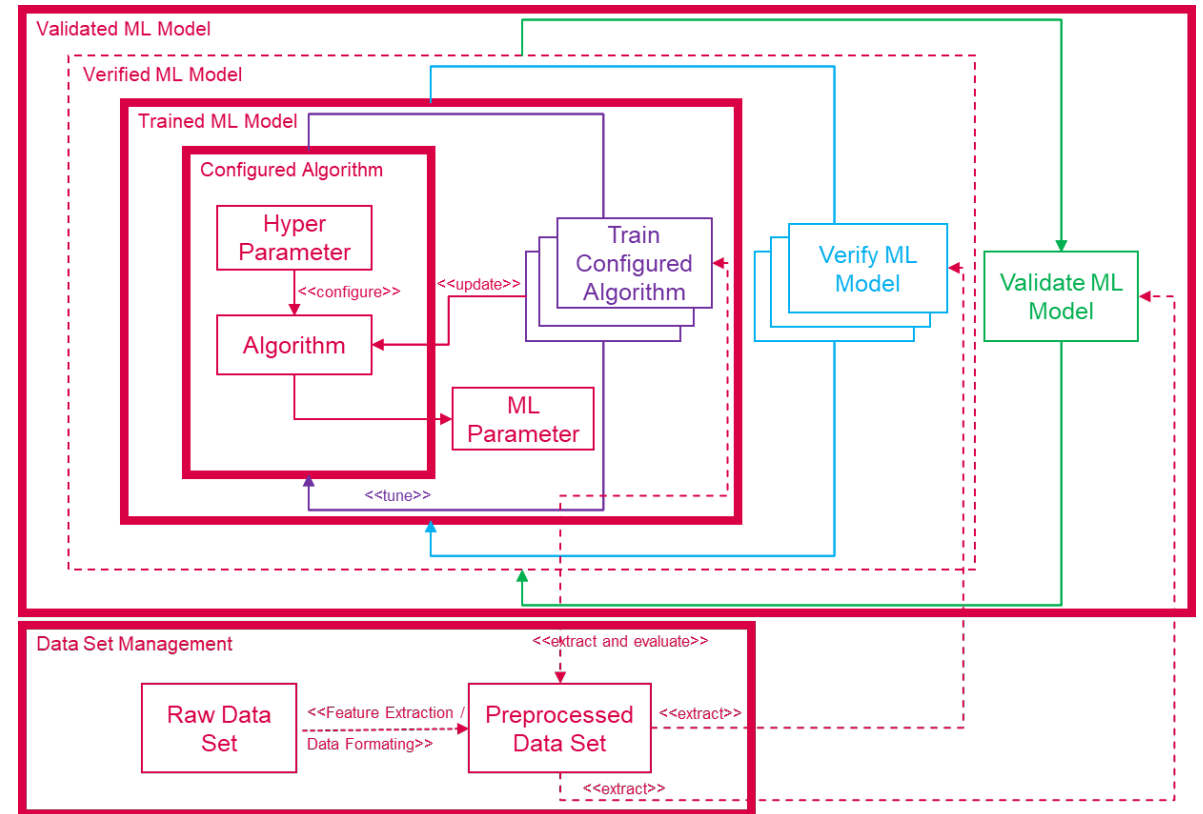
„SPICE for Machine Learning" plugin and addon content

5 New Processes and 1 new process group is introduced by the standard

VDA QMC
Verband der Automobilindustrie
Qualitäts-Management-Center

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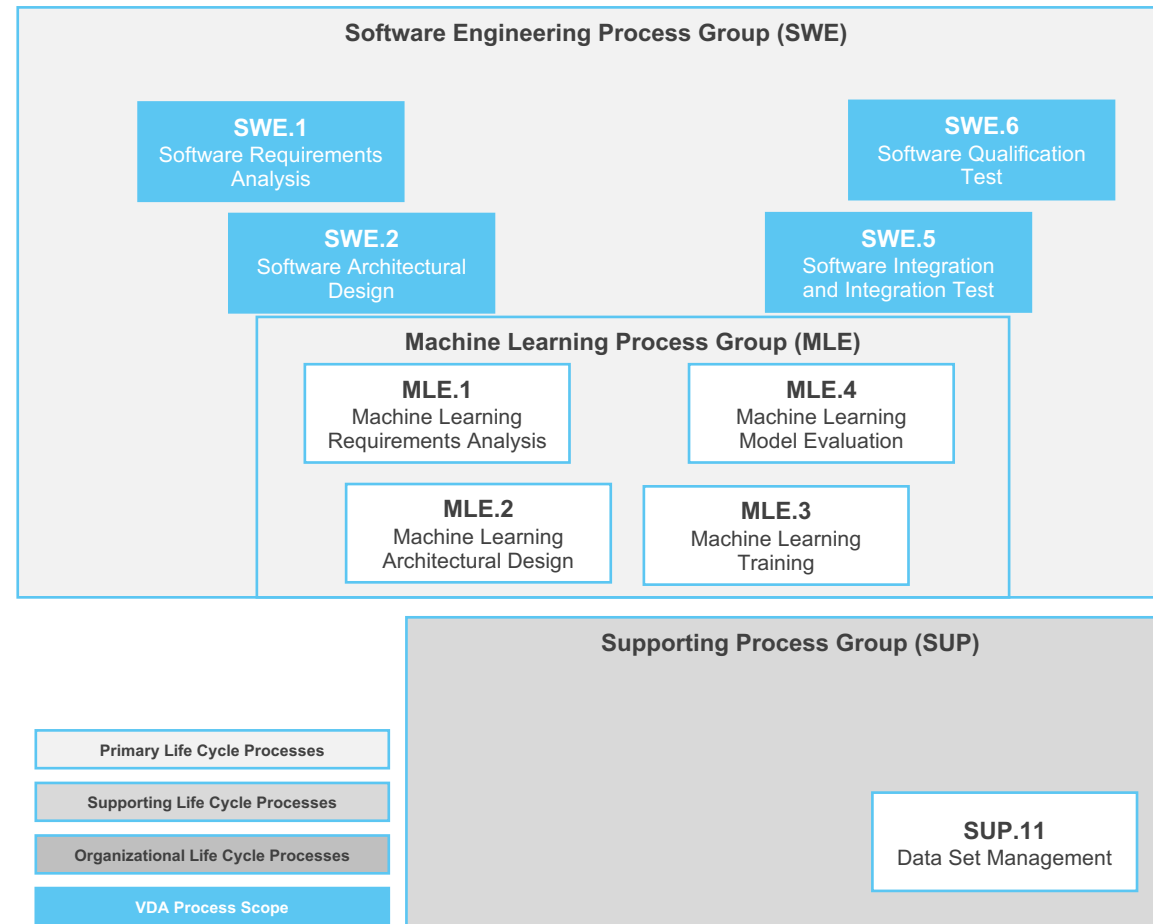Building blocks of "ASPICE Potential analysis" - BASIC and FLEX

- Scope consists of BASIC set with at least one plugin (SW, SYS, HWE..)
- Add FLEX processes as needed.
- Style and content in line with ASPICE 4.0.
- Engineering focus in configuration management and problem resolution
- Duration BASIC ~2 days

BASIC

MAN.3 + MAN.5 + organisatorisch PR	3h
Engineering Config Mgmt + Release management	2h
SWE.1 - SWE.3 (3h)	**Technical** Problem Resolution (1,5 h)
SWE.4 - SWE.6 (3h)	Quality Assurance (1,5 h)

FLEX

SYS.1 (1 h)	Cybersec (2h)
SYS.2 - SYS.3 (2h)	Change management (1 h)
SYS.4 - SYS.5 (2h)	ACQ.2+ACQ.4 (1 h)

ASPICE 4.0 (ML, HWE, MEE)

plugin
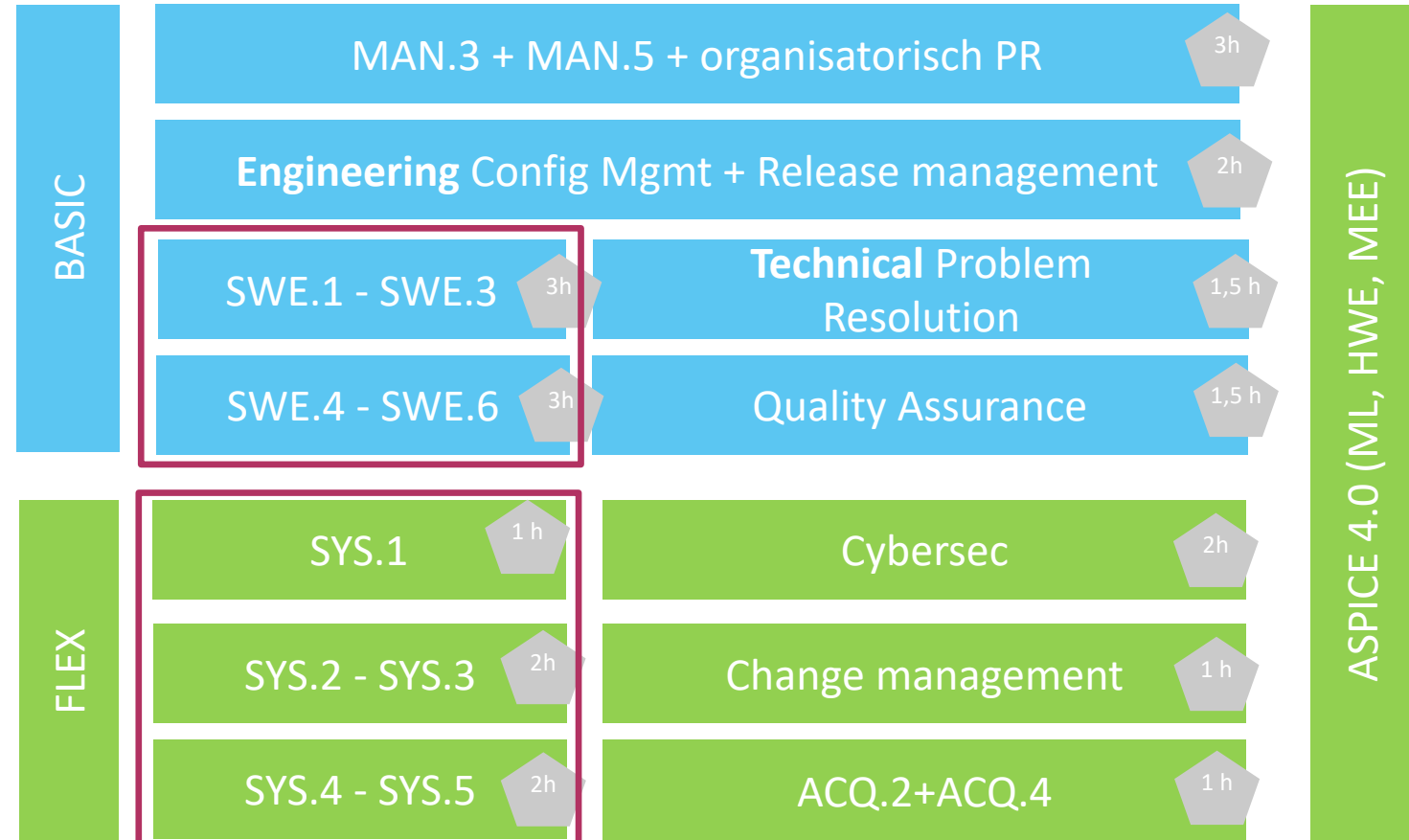
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The Measurement Framework – Planning aspects at Level 2

PA 2.1	Performance Management Attribute	PA 2.2	Documented Information Management Attribute
GP 2.1.1	Identify the objectives, and define a strategy for the performance of the process.	GP 2.2.1	Define the requirements for the documented information.
GP 2.1.2	Plan the performance of the process to fulfill the identified objectives.	GP 2.2.2	Define the requirements for documentation and control of the documented information.
GP 2.1.3	Monitor and adjust the performance of the process	GP 2.2.3	Identify and control the documented information.
GP 2.1.4	Define responsibilities, authorities and infrastructure needs.	GP 2.2.4	Review and adjust documented information to meet the defined requirements.
GP 2.1.5	Identify and make available personnel and infrastructure resources.		
GP 2.1.6	Manage the interfaces between involved parties.		

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The Measurement Framework – Clear structure at Level 3

PA 3.1	Process Definition Attribute	PA 3.2	Process Deployment Attribute
GP 3.1.1	Establish and maintain the standard process.	GP 3.2.1	Deploy a defined process.
GP 3.1.2	Determine the required competencies.	GP 3.2.2	Ensure required competencies for the defined roles.
GP 3.1.3	Determine the required infrastructure.	GP 3.2.3	Ensure required infrastructure.
GP 3.1.4	Determine suitable methods to monitor the standard/defined process.	GP 3.2.4	Monitor the performance of the (defined/deployed) process.

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Changed Concepts – Information Items

PAM 3.1	PAM 4.0
Work Breakdown Structure	Work Packages
Requirements specification	Requirements
Corrective action register	Corrective action

Focus is now on essential output of processes used directly as indicators – not on a "document".

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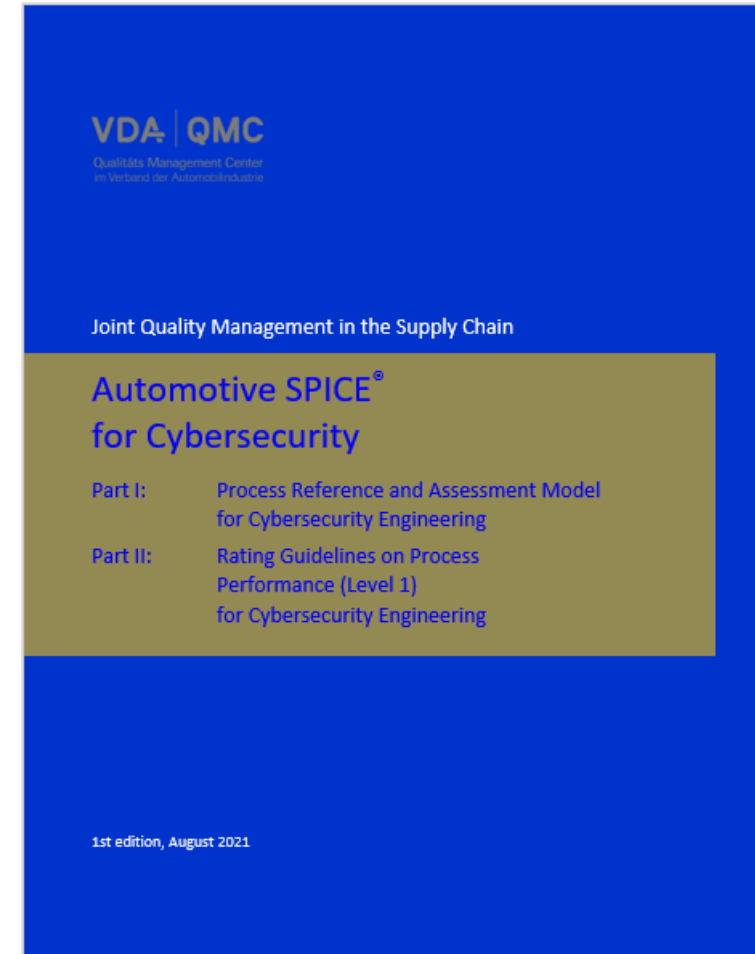Changed Concepts – Mapping Tables

- Better overview of BP and OII to outcome mapping

- Perfect basis for pocket guides

- Supports assessors

- Supports tool development

MAN.3 Project Management	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7	
Output Information item								
08-53 Scope of work	X							
14-xx Work package			X	X	X			
13-04 Communication record		X	X					
13-16 Change request							X	
13-19 Review record		X					X	
14-02 Corrective action register						X	X	
14-06 Schedule			X		X		X	
14-50 Stakeholder groups list				X				
15-06 Project status report				X		X		
Base Practices								
BP1: Define the sope of work	X							
BP2: Define project life cycle	X	X						
BP3: Evaluate feasibility of the project		X						
BP4: Define and monitor work breakdown structure			X	X	X		X	
BP5: Define and monitor project estimates and resources		X	X				X	
BP6: ensure required skills, knowledge, and experience			X				X	
BP7: Identify and monitor project interfaces and agreed commitments			X		X		X	
BP8: Define and monitor project schedule						X	X	
BP9: Ensure consistency			X	X	X		X	
BP10: Review and report progress of the project						X	X	

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Automotive SPICE ® for Cybersecurity

07/2021	Blue-Gold Book approved
09/2021	Blue-Gold Book available as Download
10/2021	Blue-Gold Book available as printed version
12/2021	Training material finalized by intacs
02/2022	Start of trainings

VDA | QMC
Qualitäts Management Center
im Verband der Automobilindustrie

Joint Quality Management in the Supply Chain

Automotive SPICE®
for Cybersecurity

Part I: Process Reference and Assessment Model
             for Cybersecurity Engineering

Part II: Rating Guidelines on Process
             Performance (Level 1)
             for Cybersecurity Engineering

1st edition, August 2021
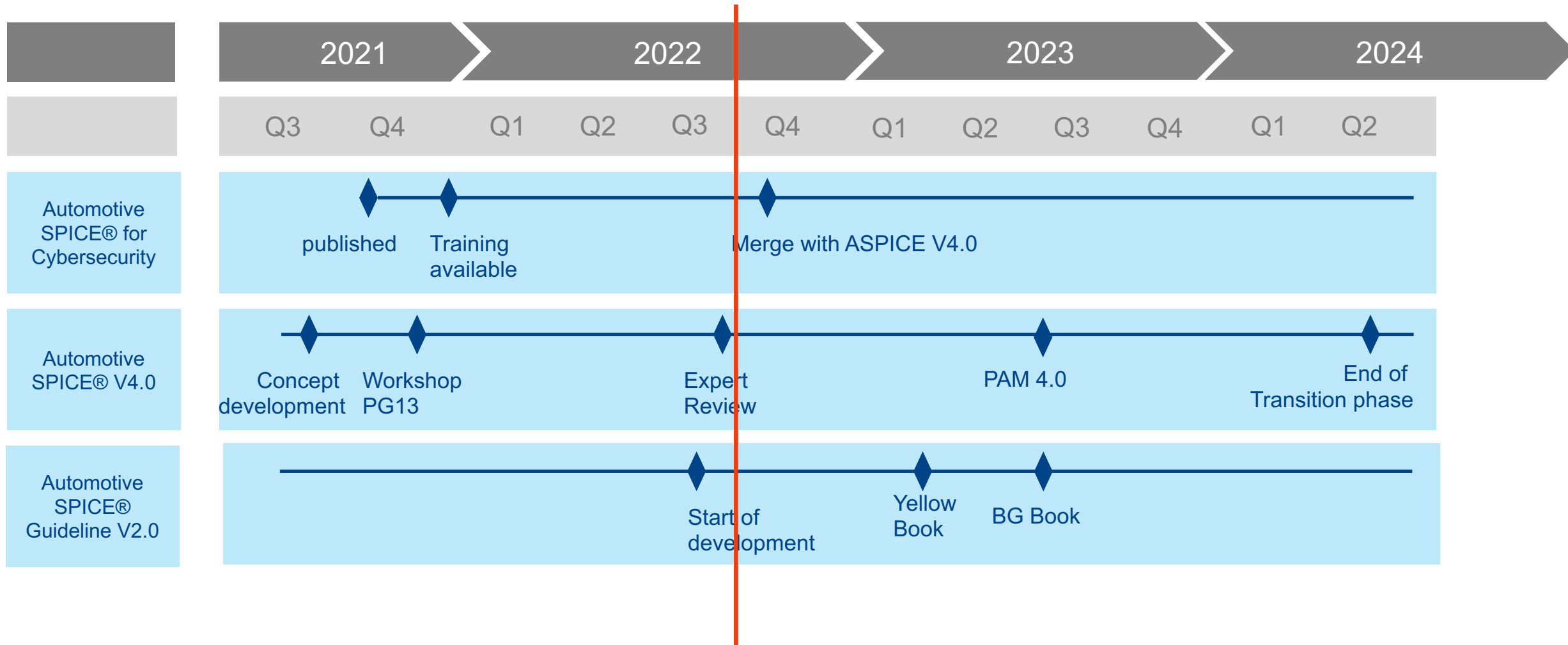
Future intacs™ Training Architecture

4d intacs™ certified Process Expert (Automotive SPICE® incl. Guidelines) **Exam**

2d intacs™ certified Process Expert (other models) **Exam**

Automotive SPICE® Introduction

Path for assessors in Automotive SPICE®

Model Extensions

Path for assessors in other models

intacs™ independent trainings are available on the market with various durations (1-day, 2-day or more). These trainings could be booked independently from intacs™ to get brief insights into the model. These trainings are NOT acknowledged for the assessor education!

4d intacs™ certified Provisional Assessor (AS) **Exam**

3d Cyber Security **Exam**

2d Hardware SPICE **Exam**

2d Mechanical SPICE **Exam**

4d intacs™ certified Provisional Assessor **Exam**

Xd Agile SPICE **Exam**

Xd Data Management SPICE **Exam**

Xd Organization SPICE **Exam**

5d intacs™ certified Competent Assessor (AS) **Exam**

Xd Improvement **Exam**

Xd *< new extensions >* **Exam**

5d intacs™ certified Competent Assessor **Exam**

Lead assessors need a certification for a model extension to perform an assessment with this extension.

Thank You!

Questions welcome

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