Overview of Process Assessment Models supported by intacs® and updated training architecture

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Agenda

About intacs®

Certification levels and updated training architecture

Automotive SPICE® PAM and related extensions

Further intacs®-accepted Model Extensions

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International Assessor Certification Scheme

What is intacs® ?

intacs® (International Assessor Certification Scheme)

- Independent and legally registered nonprofit organization
- Open and transparent operations in an honorary capacity
- Global presence, multilingual

intacs® is accepted by the automotive industry and the VDA (Verband der Automobilindustrie)

Main objective:

Ensuring high quality assessment performance through

- setting training and certification standards for ISO/IEC 330xx assessors
- setting standards for maintaining assessor competence
- promoting assessment models & community interactions

intacs® Regional Representatives

Can be an individual or an institution

- are members of the working group "Internationalization & Diversification"
- act as an interface between intacs® Advisory Board and local ISO/IEC 330xx community in their region
- representing local points of contact for certification bodies and the local ISO/IEC 330xx community
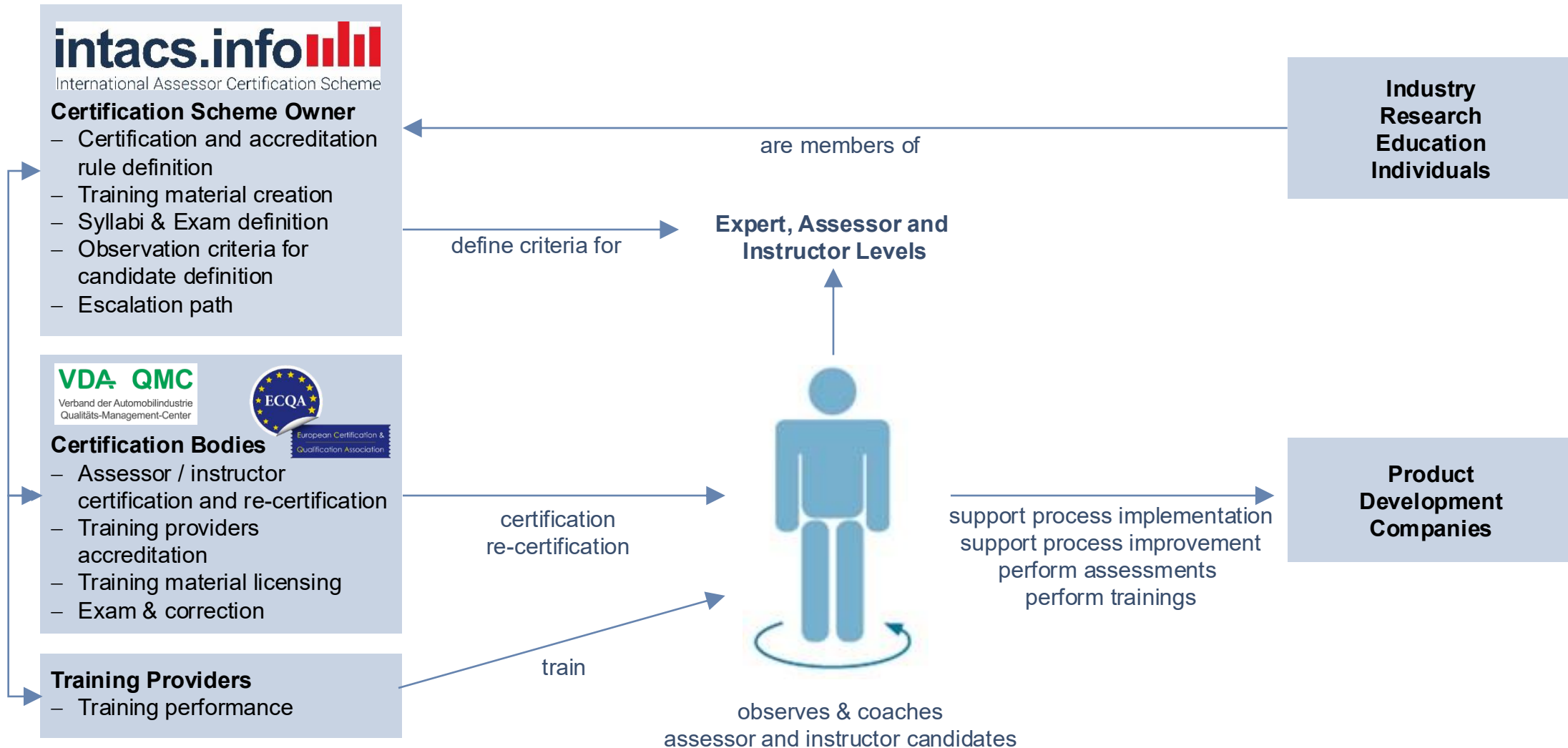
see www.intacs.info
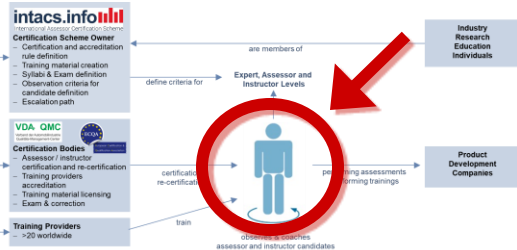→ Top Menu → Certification
→ Regional Representatives

https://intacs.info/cc-regional-representatives

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intacs® Certification Scheme and its interfaces

Certification Scheme Owner

- Certification and accreditation rule definition
- Training material creation
- Syllabi & Exam definition
- Observation criteria for candidate definition
- Escalation path

Certification Bodies

- Assessor / instructor certification and re-certification
- Training providers accreditation
- Training material licensing
- Exam & correction

Training Providers

- Training performance

Industry Research Education Individuals

are members of

define criteria for

Expert, Assessor and Instructor Levels

certification re-certification

train

Product Development Companies

support process implementation
support process improvement
perform assessments
perform trainings

observes & coaches
assessor and instructor candidates

intacs® certification levels for assessors and instructors

- Proven teaching skills
- Approval by an accredited instructor (observation process)
- No training course or exam

"intacs® certified Instructor Competent Level"
(qualified for all passed PE/PA model and extension trainings/exams; domain specific qualifications may apply*)

"intacs® certified Instructor Provisional Level"
qualified for all passed PE/PA model and extension trainings/exams; domain specific qualifications may apply*)

- Continuously and actively contributes to the international SPICE community's knowledge & best practices
- No training course or exam

"intacs® certified Principal Assessor"
(qualified for all passed PE/PA model and extension trainings/exams; domain specific qualifications may apply*)

- Active assessment experience
- Passed CA training course & exam
- Approval by an accredited assessor (observation process)
- Capable of leading assessments

"intacs® certified Competent Assessor"
(qualified for all passed PE/PA model and extension trainings/exams; domain specific qualifications may apply*)

- Little or no assessment experience
- Passed PA training course & exam
- Capable of performing internal evaluations & acting as a co-assessor in official assessments

"intacs® certified Provisional Assessor"
(qualified for all passed PE/PA model trainings/exams; domain specific qualification requirements may apply*)

- Little or no assessment experience
- Passed PE training course & exam
- Capable of supporting internal improvement activities

"intacs® certified Process Expert"
(Automotive SPICE®, Test SPICE, Medical SPICE, SPICE for IT Services, …)

Combined training & exam possible

* e.g. VDA-specific requirements for qualification

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intacs® Training Architecture since October 2024

Standard Lane

| 4d | intacs® certified Process Expert (Automotive SPICE®) *1*2 | Exam |

| 4d | intacs® certified Provisional Assessor (Automotive SPICE®) *3 | Exam |

| 5d | intacs® certified Competent Assessor (Automotive SPICE®) | Exam |

Model Extensions

| 2d | Hardware SPICE *2*3 | Exam |
| 2d | Mechanical SPICE | Exam |

| 2d | Machine Learning SPICE *2*3 | Exam |
| 2d | Agile SPICE | Exam |

| 3d | Cyber Security SPICE *2*3 | Exam |
| Xd | Data Management SPICE | Exam |

| Xd | < new extensions > | Exam |

Combined Lane

| 7d | intacs® certified Process Expert and Provisional Assessor (Automotive SPICE®) *1*2*3 | Exam |

| 5d | intacs® certified Competent Assessor (Automotive SPICE®) | Exam |

*1 includes Base / System / Software processes without HWE and MLE, emphasizes Process Improvement
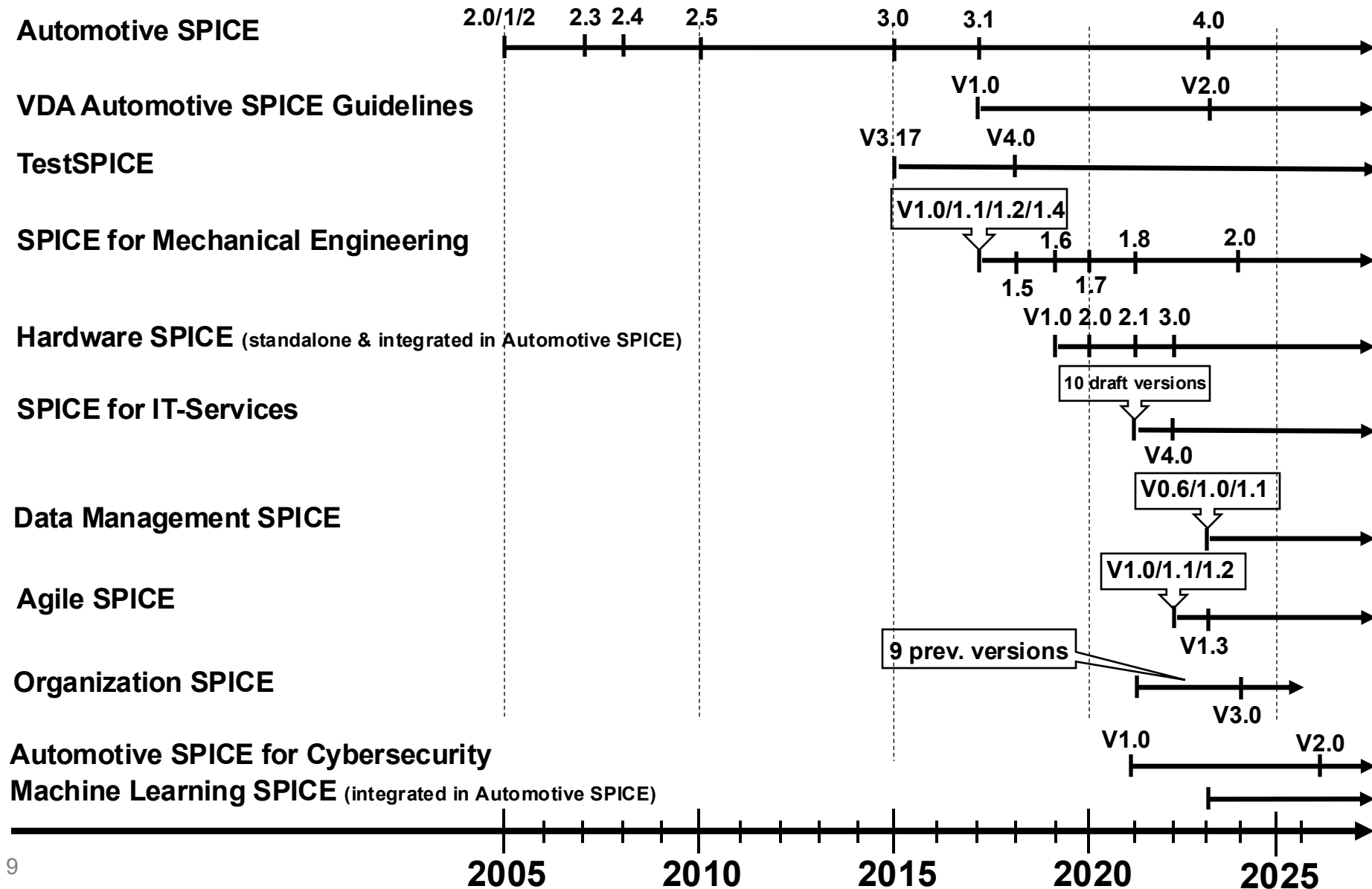
*2 includes all Guideline aspects regarding content

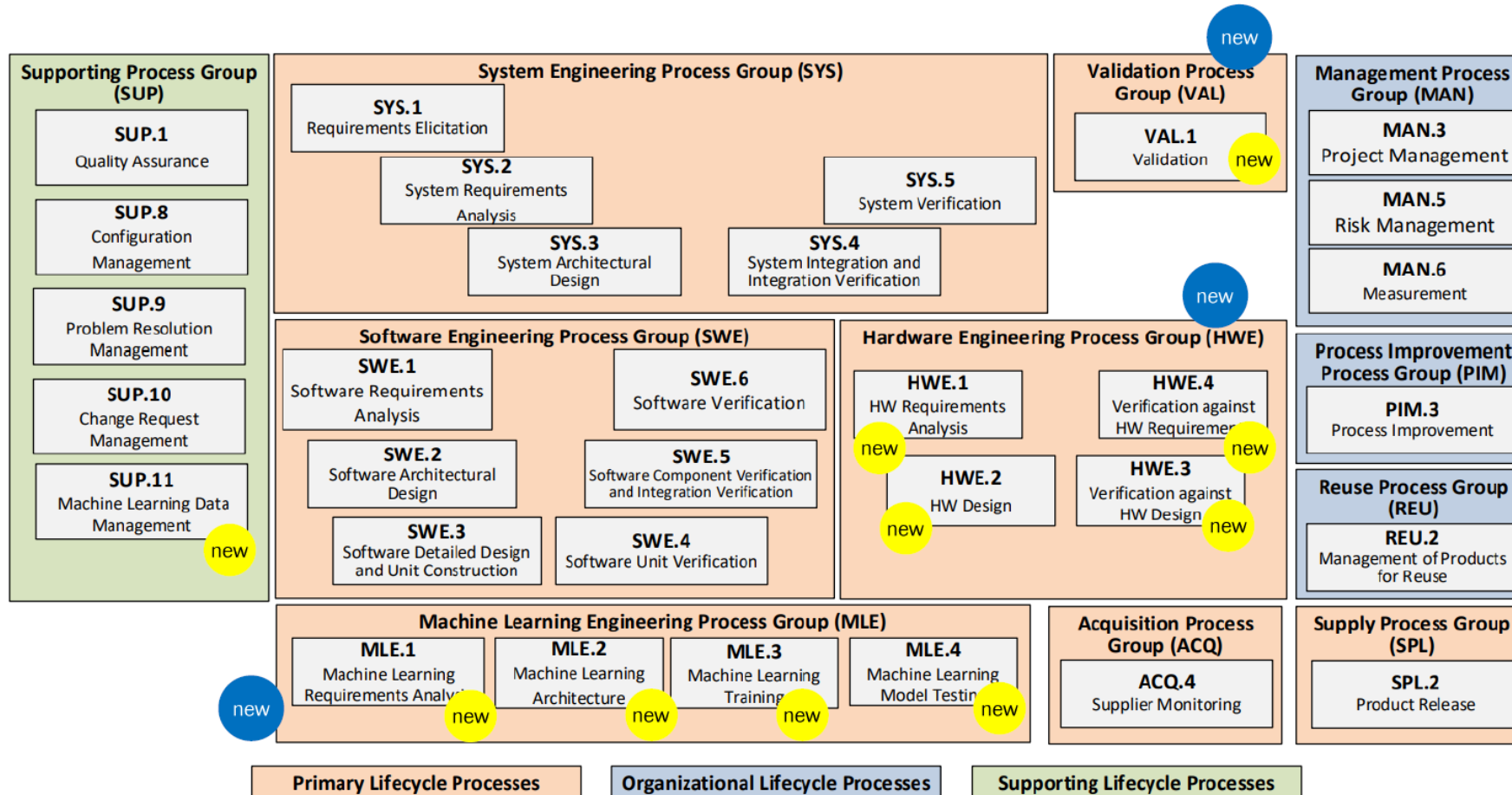*3 includes all Guideline aspects regarding rating rules

Combined Lane is an alternative to the Standard Lane, but not recommended from a didactical point of view.

Participants of the Combined Lane can decide, if they would do the first part only and finish with the Expert exam or continue with the second part.

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History of Automotive SPICE and related models

Automotive SPICE
2.0/1/2   2.3 2.4   2.5   3.0   3.1   4.0

VDA Automotive SPICE Guidelines
V1.0   V2.0

TestSPICE
V3.17   V4.0

SPICE for Mechanical Engineering
V1.0/1.1/1.2/1.4   1.6   1.8   2.0
1.5   1.7

Hardware SPICE (standalone & integrated in Automotive SPICE)
V1.0 2.0 2.1 3.0

SPICE for IT-Services
10 draft versions
V4.0

Data Management SPICE
V0.6/1.0/1.1

Agile SPICE
V1.0/1.1/1.2
V1.3

Organization SPICE
9 prev. versions
V3.0

Automotive SPICE for Cybersecurity
V1.0   V2.0

Machine Learning SPICE (integrated in Automotive SPICE)

2005   2010   2015   2020   2025

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Automotive SPICE and its new extensions

Supporting Process Group (SUP)
- SUP.1 Quality Assurance
- SUP.8 Configuration Management
- SUP.9 Problem Resolution Management
- SUP.10 Change Request Management
- SUP.11 Machine Learning Data Management *(new)*

System Engineering Process Group (SYS)
- SYS.1 Requirements Elicitation
- SYS.2 System Requirements Analysis
- SYS.3 System Architectural Design
- SYS.4 System Integration and Integration Verification
- SYS.5 System Verification

Validation Process Group (VAL) *(new)*
- VAL.1 Validation *(new)*

Management Process Group (MAN)
- MAN.3 Project Management
- MAN.5 Risk Management
- MAN.6 Measurement

Software Engineering Process Group (SWE)
- SWE.1 Software Requirements Analysis
- SWE.2 Software Architectural Design
- SWE.3 Software Detailed Design and Unit Construction
- SWE.4 Software Unit Verification
- SWE.5 Software Component Verification and Integration Verification
- SWE.6 Software Verification

Hardware Engineering Process Group (HWE) *(new)*
- HWE.1 HW Requirements Analysis *(new)*
- HWE.2 HW Design *(new)*
- HWE.3 Verification against HW Design *(new)*
- HWE.4 Verification against HW Requirement *(new)*

Process Improvement Process Group (PIM)
- PIM.3 Process Improvement

Reuse Process Group (REU)
- REU.2 Management of Products for Reuse

Machine Learning Engineering Process Group (MLE) *(new)*
- MLE.1 Machine Learning Requirements Analysis *(new)*
- MLE.2 Machine Learning Architecture *(new)*
- MLE.3 Machine Learning Training *(new)*
- MLE.4 Machine Learning Model Testing *(new)*

Acquisition Process Group (ACQ)
- ACQ.4 Supplier Monitoring

Supply Process Group (SPL)
- SPL.2 Product Release

Primary Lifecycle Processes | Organizational Lifecycle Processes | Supporting Lifecycle Processes

3 additional process groups *(new)*

10 additional processes *(new)*

10 processes removed

(SPL.1, SUP.2, SUP.4, SUP.7, ACQ.3, ACQ.11 –15)

2762 comments processed

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# Hardware SPICE (integrated in Automotive SPICE)

- The technical scope of Hardware SPICE is electrical or electronic hardware engineering.

- This excludes:

  - system level engineering, i.e. neither the mechatronic nor the ECU level. See also the definition of the term "hardware" in clause 1.8;

  - procurement (see clause 3.3);

  - mechanical or hardware sample manufacturing (see clause 3.3);

  - production processes (see clause 3.3).

- However, process interfaces are included to

  - procurement in terms of receiving physical design-compliant hardware parts;

  - production and prototype/sample workshops in terms of providing information such as production data and requirements, and receiving compliant samples, respectively.

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Machine Learning SPICE (integrated in Automotive SPICE)

Motivation: an increasing number of products, especially in the ADAS domain, involve machine learning. The SWE.X processes are not suitable for assessing these.

General Considerations

- Machine Learning (MLE) is different to the "typical" development of Automotive software-driven systems.

- In MLE, data analysis and management as well as algorithm training are the most important and critical activities.

- In MLE, data quality is very important and addressed by SUP.11 MLE Data Management.

- The MLE processes do not cover development of the MLE software itself.

- The MLE group can be used as a plug-in below SWE.2 Software Architectural Design and finds its re-entry at SWE.5 Software Integration and Integration Test.


→ Page 61 in the PAM

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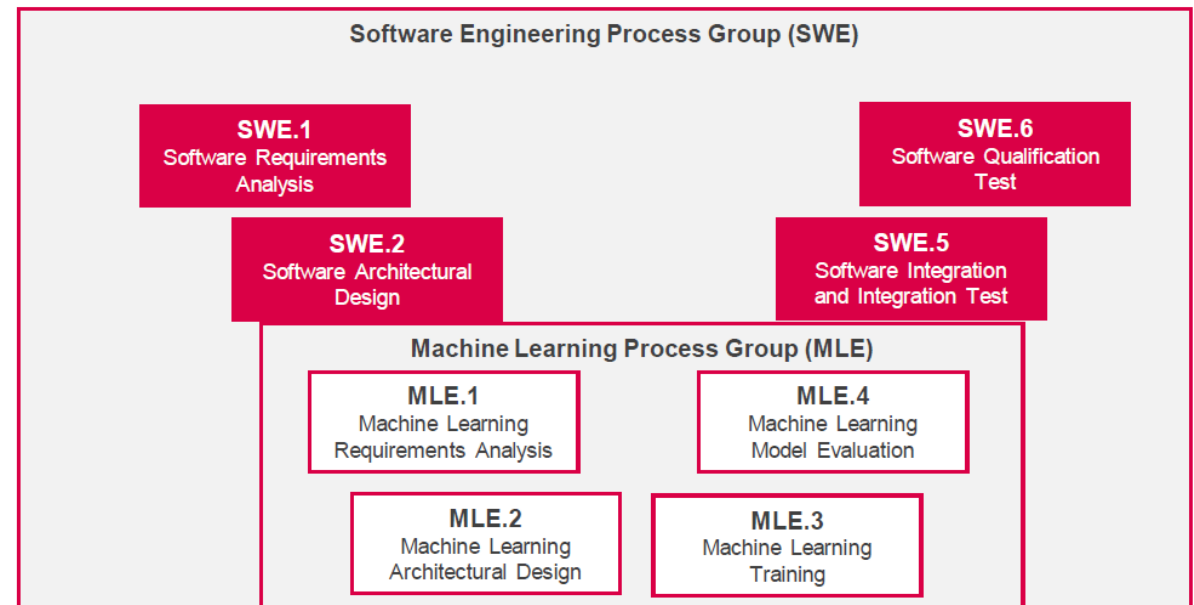
Automotive SPICE® for Cybersecurity

The UNECE regulation R155 requires, among others, that the vehicle manufacturer identify and manage cybersecurity risks in the supply chain.

Automotive SPICE is a process assessment model, when used with an appropriate assessment method, which helps to identify process-related product risks.

To incorporate cybersecurity-related processes into the proven scope of Automotive SPICE, additional processes have been defined for Cybersecurity Engineering.
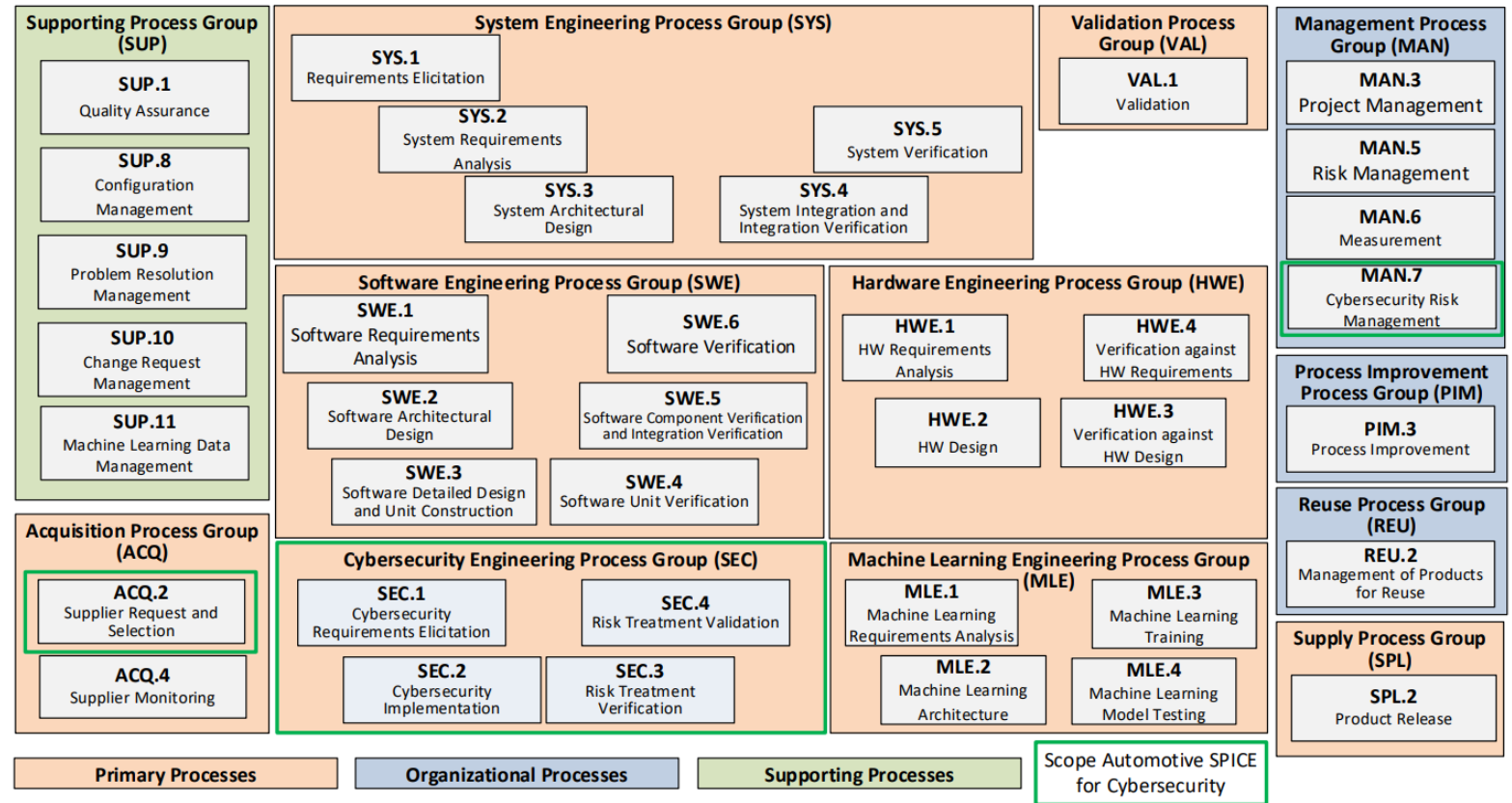

Source: Automotive SPICE® for Cybersecurity v2.0, March 2025

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Automotive SPICE® Potential Analysis

The Automotive SPICE® Potential Analysis provides a standardized method to support the evaluation of the capability of a potential collaboration or partnership to realize and deliver a planned product or service. This is not limited to customer-supplier relations only.

The Automotive SPICE® Potential Analysis is intended to be used as a precondition to a customer awarding a contract for a specific product or service or to substitute a missing (Automotive SPICE®) Supplier Self Evaluation.
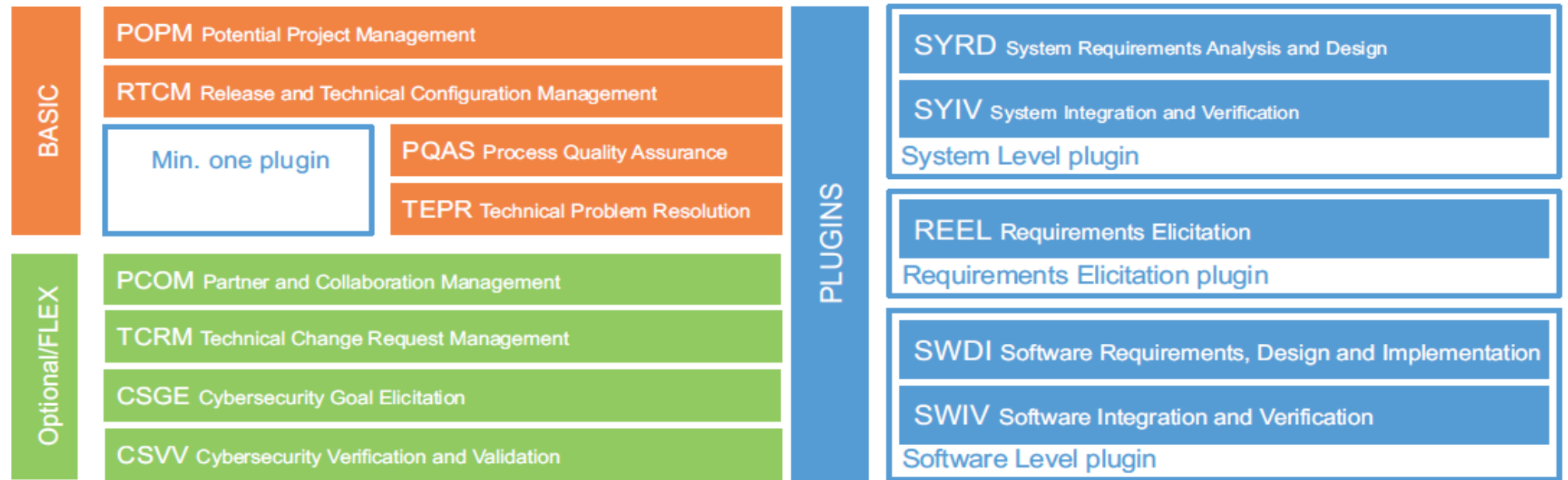
Source: Automotive SPICE® Potential Analysis v1.0, August 2024

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Further intacs®-accepted models / extensions

- intacs® supports not only the Automotive domain with Automotive SPICE®-specific model extensions, but also any other domain with model extensions that fulfill the requirements of ISO/IEC 33004.

- For an overview of currently supported model extensions, please have a look on https://www.intacs.info/spice-center/ .

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DO YOU HAVE ANY QUESTIONS?

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Backup-Up Slides

Overview of Process Assessment Models supported by intacs® and updated training architecture

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Assessor certification statistics
VDA QMC – Automotive SPICE® – Trend

28.08.2024: 7451 active assessor licenses

2023: +29 %
2022: +14%
2021: +15%
2020: +11%
2019: +29 %
2018: +28 %
2017: +32 %
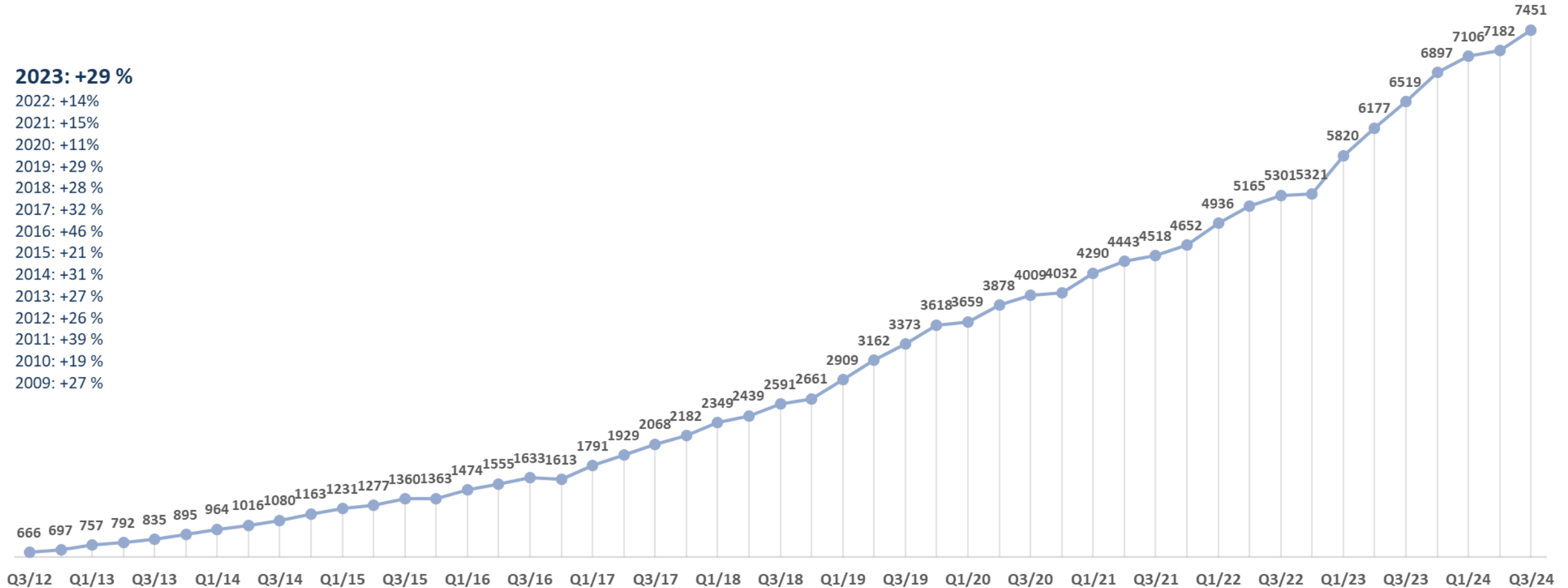2016: +46 %
2015: +21 %
2014: +31 %
2013: +27 %
2012: +26 %
2011: +39 %
2010: +19 %
2009: +27 %

Data point values on the trend line:
666, 697, 757, 792, 835, 895, 964, 1016, 1080, 1163, 1231, 1277, 1360, 1363, 1474, 1555, 1633, 1613, 1791, 1929, 2068, 2182, 2349, 2439, 2591, 2661, 2909, 3162, 3373, 3618, 3659, 3878, 4009, 4032, 4290, 4443, 4518, 4652, 4936, 5165, 5301, 5321, 5820, 6177, 6519, 6897, 7106, 7182, 7451

X-axis: Q3/12, Q1/13, Q3/13, Q1/14, Q3/14, Q1/15, Q3/15, Q1/16, Q3/16, Q1/17, Q3/17, Q1/18, Q3/18, Q1/19, Q3/19, Q1/20, Q3/20, Q1/21, Q3/21, Q1/22, Q3/22, Q1/23, Q3/23, Q1/24, Q3/24

Source: VDA QMC, 28 August 2024

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Assessor certification statistics
VDA QMC – Automotive SPICE® – Distribution of assessor levels
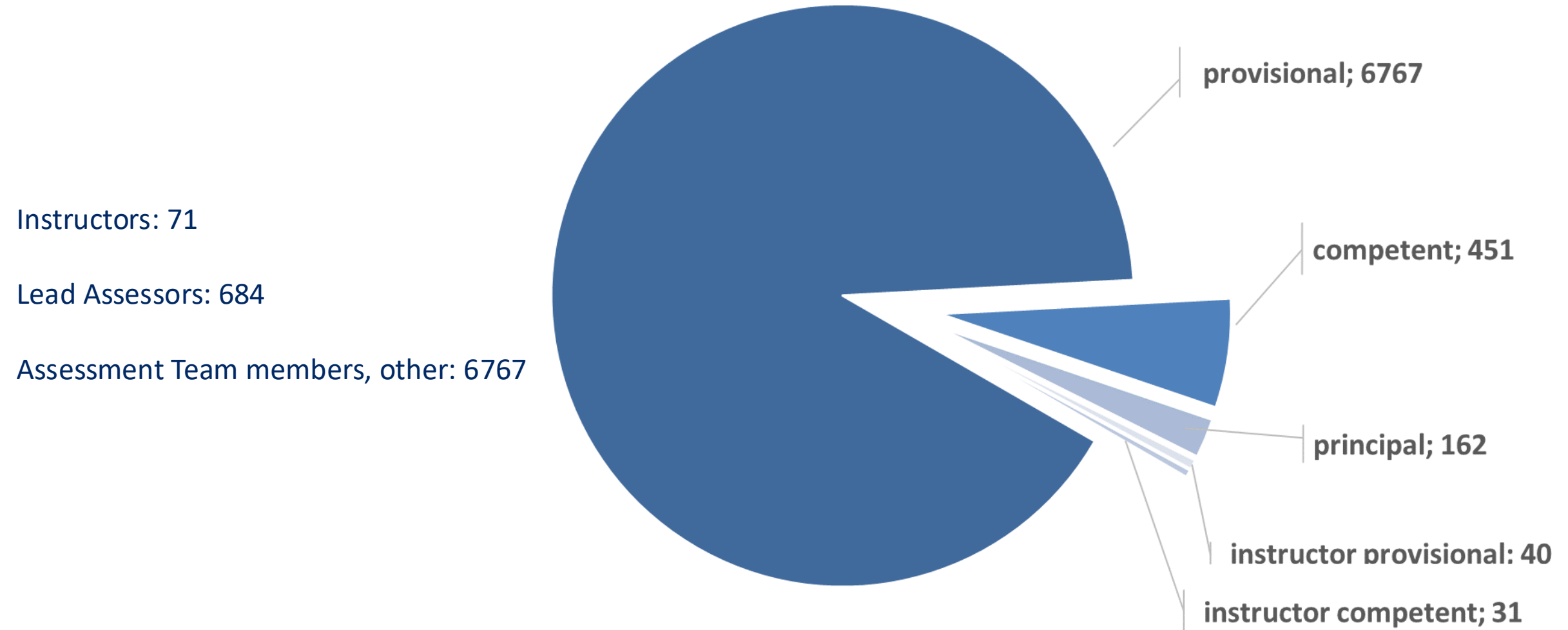
Instructors: 71

Lead Assessors: 684

Assessment Team members, other: 6767

provisional; 6767

competent; 451

principal; 162

instructor provisional: 40

instructor competent; 31

Source: VDA QMC, 28 August 2024

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Assessor certification statistics
VDA QMC – Automotive SPICE® – International Distribution

Number of Assessors - global distribution

Country	Count
Germany	2180
China	1473
Japan	1039
South Korea	753
India	613
USA	237
Romania	173
Egypt	91
Poland	81
France	76
Austria	69
Spain	57
Hungary	54
Taiwan	53
Mexico	52
Czech republic	49
Italy	46
Vietnam	37
Great Britain	36
Ukraine	25
Serbien	23
Netherlands	23
Israel	22
Sweden	22
Singapore	21
Bulgaria	18

Pie chart labels: Others; 1156 · Germany; 2180 · USA; 237 · India; 613 · South Korea; 753 · Japan; 1039 · China; 1473

Source: VDA QMC, 28 August 2024

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