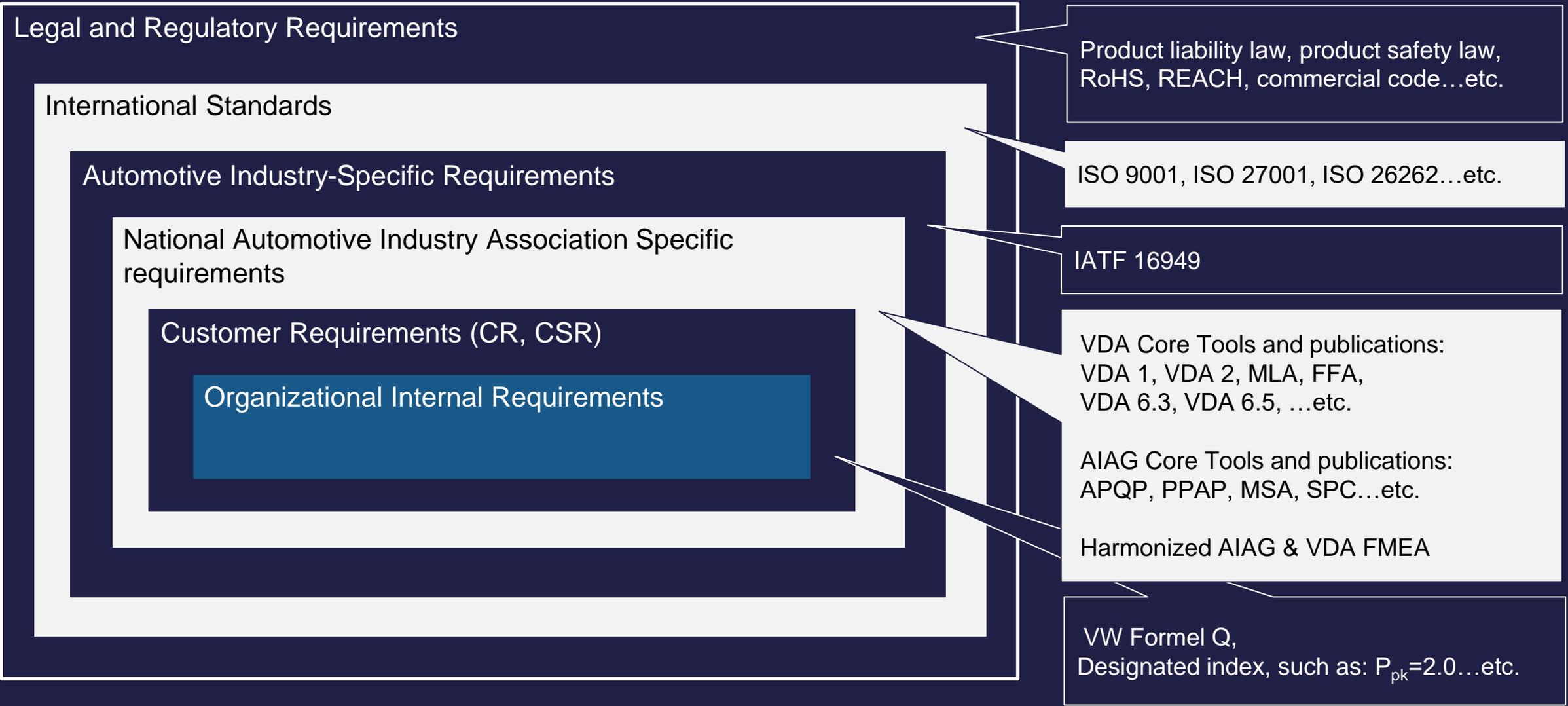


汽車業品質管理系統的旅程指引

Roadmap for Automotive Quality Management System

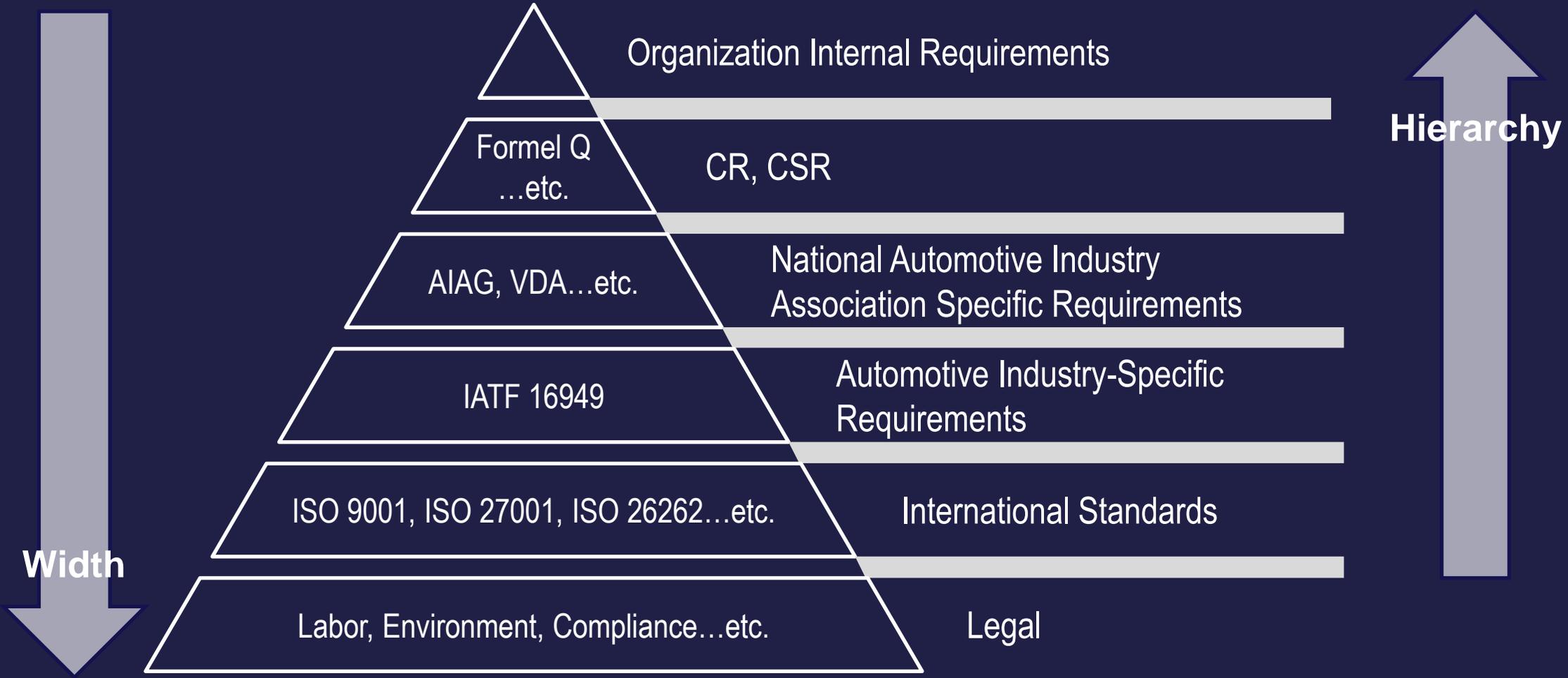
- Automotive Quality Management System - Structure
- Product Life Cycle
- Core Tool Comparison – Requirement & Development Phase
- Quality Method Comparison – Production & Usage Phase
- Automotive Quality Management System – Roadmap

AUTOMOTIVE QUALITY MANAGEMENT SYSTEM STRUCTURE



Source: VDA QMC, ID417 Training Material

AUTOMOTIVE QUALITY MANAGEMENT SYSTEM STRUCTURE





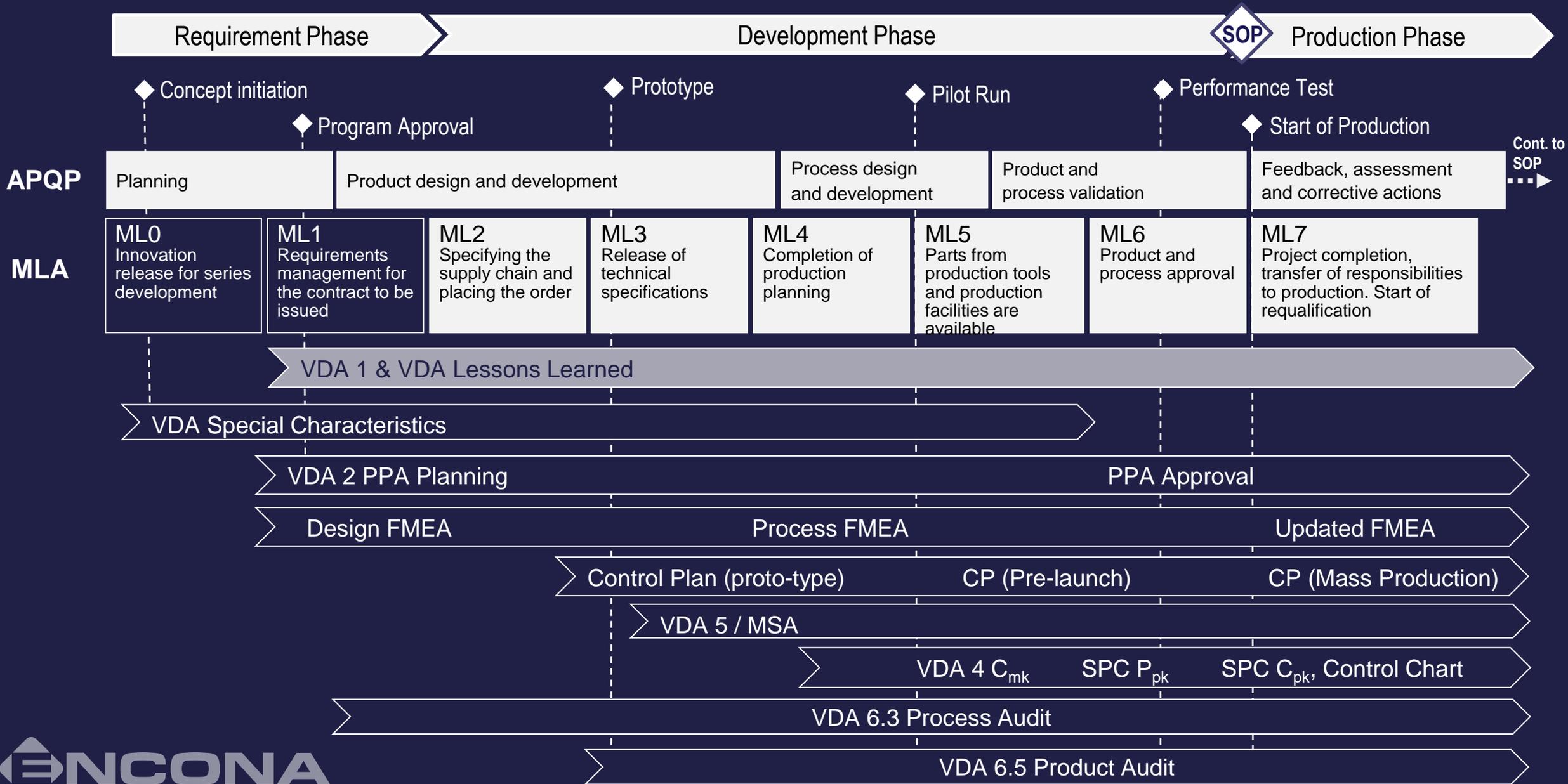
SOP = Start of Production

EOP = End of Production

EOL = End of Life (Product Disposal)

PRODUCT LIFE CYCLE

REQUIREMENT & DEVELOPMENT PHASE



CORE TOOLS COMPARASION

REQUIREMENT & DEVELOPMENT PHASE

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Project Management

MLA (Maturity Level Assurance for New Parts)

APQP (Advance Product Quality Planning)

Agile Collaboration

Analysis to Measurement Process

VDA 5 Measurement and Inspection Process

MSA (Measurement System Analysis)

Statistical Control for Process

VDA 4 Economical Process Design

SPC (Statistical Process Control)

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Production Part Approval

VDA 2 PPA
(Production Process and Product Approval)

PPAP
(Production Part Approval Process)

Risk Analysis for Design

Harmonized AIAG & VDA FMEA

Harmonized AIAG & VDA FMEA

Design Concept

Special Characteristics

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MLA (Maturity Level Assurance for New Parts)

- *For VW suppliers, it is part of QPNI.*
- *Including evaluation of E/E and Software.*
- *Communicate development risks through whole supply chain.*
- *Two-way evaluation.*

Agile Collaboration

Providing collaborate framework to assure compliance and product safety in agile teams.

APQP (Advance Product Quality Planning)

- *Evaluation of E/E and Software is NOT included.*
- *Control Plan.*

Harmonized AIAG & VDA FMEA

- *Managing FMEA as project with 7-Step Process.*
- *Evaluation of **Functional Safety** is included as FMEA-MSR.*
- *Evaluate product/process risks through supply chain.*
- *Using AP (Action Priority) instead of RPN.*

VDA QMC**AIAG****VDA 2 PPA (Production Part Approval)**

- *For VW suppliers, it is part of QPNI.*
- *Including deliverable in related to Software approval.*
- *Timing and communication level for PPA re-submission is defined in Trigger Matrix.*
- *Comparison with AIAG PPAP is included in appendix.*

PPAP (Production Part Approval Process)

- *Evaluation of E/E and Software is NOT included.*

Special Characteristics

- *For VW suppliers, it means D/TLD.*
- *Concept of “Robust Design” and “Loss Function”.*
- *Interplay of “Functional robustness” and “Manufacturing robustness”.*

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VDA 5 Measurement and Inspection Process

- *Supplementary handbook with examples for implementation*
- *Synchronization with other standards, such as: IATF 16949, AIAG MSA 4th Edition, ISO 31000, ISO 17025...etc.*
- *Gauge capability indicator: C_{gk}*
- *Contribution to the systems engineering process*
- *Covers both attribute and variable data, incl. overall review to attributive inspection*

VDA 4 Economical Process Design

- *Provide an integrated view to balance customers' requirement and economical implementation.*
- *Machine Capability: P_{mk} (or as C_{mk}), Process Capability: P_{pk} , C_{pk}*
- *Alternative control chart: Acceptance Chart, Shewhart QCC with Extended Limits.*

MSA (Measurement System Analysis)

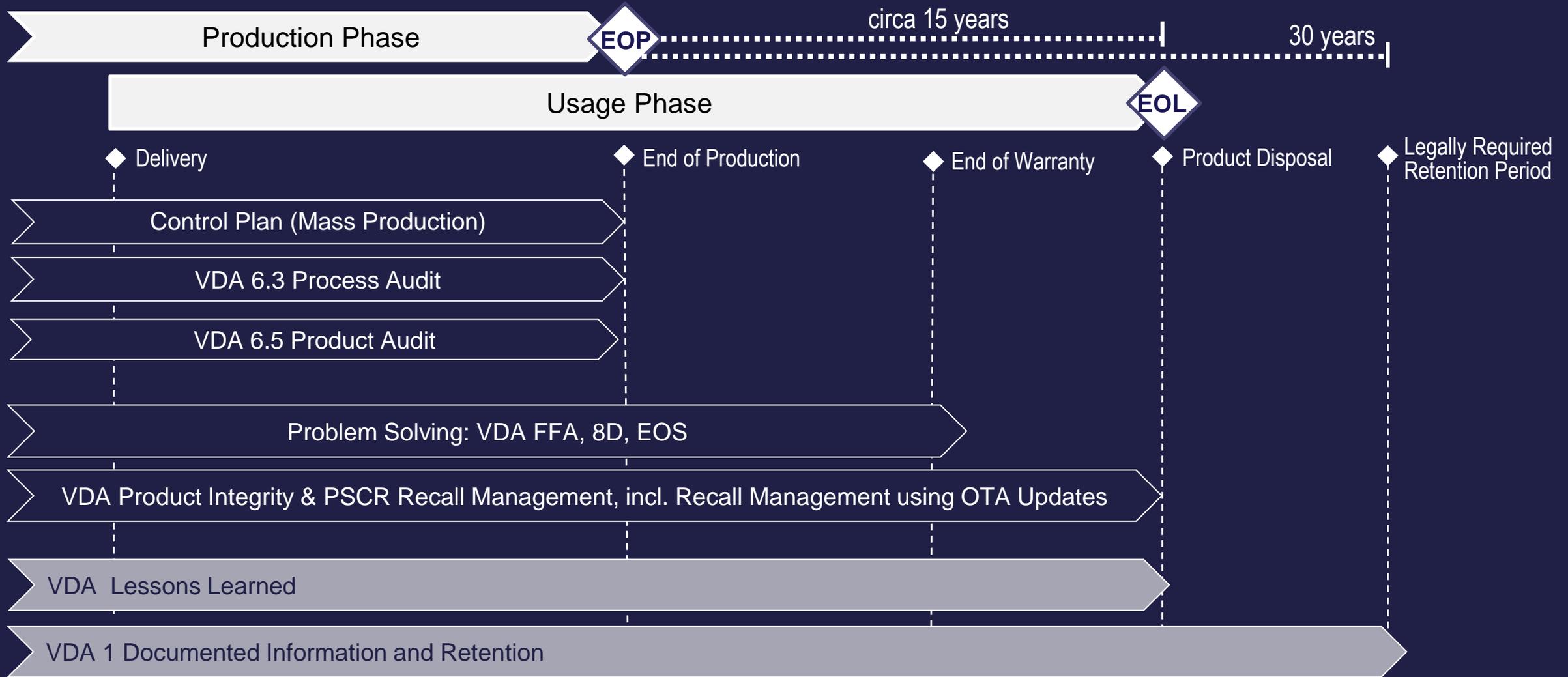
- *MSA measures the Repeatability, Reproducibility, Bias, Stability, Resolution, and Linearity of a measurement system. Consider Discrimination / Resolution.*
- *Gauge R&R, NDC.*
- *Assess to both attribute and variable data.*

SPC (Statistical Process Control)

- *Guideline for selecting suitable Control Chart.*
- *Definition of different types of Control Chart and process indices: P_p , P_{pk} , C_p , C_{pk}*

PRODUCT LIFE CYCLE

PRODUCTION & USAGE PHASE



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Audit method

VDA 6.3 Process Audit

VDA 6.5 Product Audit

CQI Special Processes Assessments Series

Problem Solving

FFA (Field Failure Analysis)

8D - Problem Solving in 8 Disciplines

EOS (Electrical Overstress)

CQI 14 Warranty Management

CQI 20 Effective Problem Solving

VDA QMC

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Product Safety and Conformity Management

Product Integrity

Recall Management Using Over-the Air Updates

Organizational Knowledge Management

Lessons Learned

VDA 1 Documented Information and Retention

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VVDA 6.3 Process Audit

- *Applicable for all industry sectors in automotive supply chain.*
- *Applicable for both series production manufacturer and service provider.*

For equipment manufacturer, refer to VDA 6.7.

- *With flexibility to use in different phases of product life cycle.*
- *Assess with measurable evaluation result.*
- *Consideration of interface of Hardware and Embed Software.*

VDA 6.5 Product Audit

- *Considering concept of ISO 19011, risked-based approach (Audit Program) and CIP (Continuous Improvement).*
- *Applicable in different phases of product life cycle, such as: Prototype, Pre-Launch, Semi-Product and Final Product.*
- *Assess with measurable evaluation result.*

CQI Special Processes Assessments Series

- *Divided into different manual for each industrial sector.*
- *Not applicable for service provider .*

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FFA (Field Failure Analysis)

- *Designated by Daimler, BMW and VW.*
- *It is cited in Daimler and BMW documents that Field Returns Audit in acc. to FFA is possible.*
- *Emphasize of early implementation at planning phase of design and development. MLA ML4, ML6 and ML7 and VDA 6.3 P3.4, P4.7, and P7.4.*
- *Guideline of NTF process is provided.*

CQI 14 Warranty Management

- *Providing guideline with Best-Practice approach for managing warranty management process.*
- *NTF (No Trouble Found) Decision Tree*

8D - Problem Solving in 8 Disciplines

- *In connection to VDA handbook Standardized Process for Handling Customer Complaints and Problem Solving process.*
- *Assessment checklist for evaluating 8D process.*

CQI 20 Effective Problem Solving

- *Guideline to develop and implement a robust process of Problem Solving.*

EOS (Electrical Overstress)

VDA QMC

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Product Integrity

- ***PSCR Representative** in supply chain is designated by BMW and VW.*
- *Aim to drive clear communication in supply chain and better understanding of **Product Safety** and **Product Conformity**.*
- *Coordination of Quality Management, Functional Safety Management, Homologation Expert and CoP (Conformity of Production).*
- *Clear structure of information flow for Recall event.*

Recall Management Using Over-the Air Updates

- *OTA need to be assured until EOL (Product Disposal), much longer then EOP.*
- *We must consider how to approve and release of updated software after SOP and EOP using VDA 2 PPA.*

VDA QMC

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Lessons Learned

- *Provide detailed structure of how to implement lessons learned process.*
- *From collect and record, evaluate, and distribute the knowledge.*
Apply and implement lessons learned to eliminate repeat nonconformances.
- *The ultimate goal is to leverage Lessons Learn to motivate continuous improvement.*

VDA 1 Documented Information and Retention

- *It describes the handling of information and documentation within the framework of the product life cycle.*
- *Guideline with examples for difference classifications and retention period.*



- ISO 26262
- ISO/PAS 21448
- IEC 61508

- ISO 9001, IATF 16949
- VDA Core Tools
- VDA Publications
- AIAG Core Tools
- Quality Methods
- ASPICE
- Agile Collaboration

- ISO 27001
 - VDA ISA TISAX
- Cybersecurity Management Systems (CSMS)

- VDA ACSMS
- ASPICE for Cybersecurity
- ISO 21434

Software Update Management Systems (SUMS)

- PI Recall Management using OTA Updates
- ISO 24089

AUTOMOTIVE QUALITY MANAGEMENT SYSTEM ROADMAP





Thank you very much for your attention!

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