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PDQ Guideline V2.1

A global standard for Product Data Quality

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Chairman SASIG PDQ

SASIG PDQ Guideline V2.1

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Overview

- Who and what is SASIG
- What does PDQ mean
- PDQ Business Case
- Goals of the PDQ initiative
- PDQ Strategy
- Content PDQ Guideline V2
- Experience Report
- Next Steps

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Who and what is SASIG

SASIG is a federation of national organisations to initiate, create, distribute and use global automotive engineering standards and promote their global implementation

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Current Activities

- AP214 maintenance (edition 3)
- Product Data Quality (PDQ)
- Technical Data Package Exchange (XMTD)
- Digital Engineering Visualisation (DEV)
- PDM Data Exchange
- Engineering Change Management (ECM)
- Digital Manufacturing

➢ see http://www.sasig.com for details

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What does PDQ mean

- Good Product Data Quality means that a CAD model/part fulfills defined[1)] requirements regarding important[2)] properties.
- [1)] Without a definition of requirements and properties, PDQ can neither be created nor measured.
- [2)] Important properties (e.g. accuracy of the description, completeness, structure, etc.) are such critical for users in subsequent processes to perform their job.
- Sender and Receiver of CAD models have to agree upon important properties and methods to ensure them.

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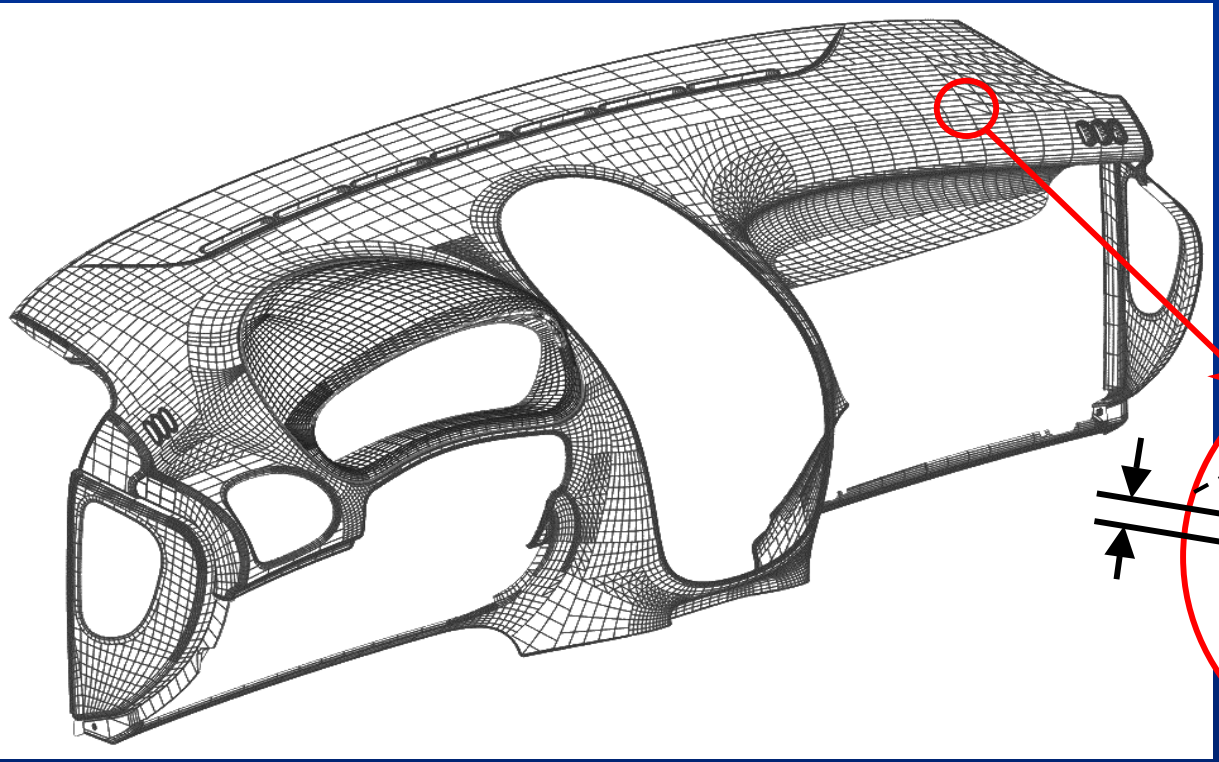
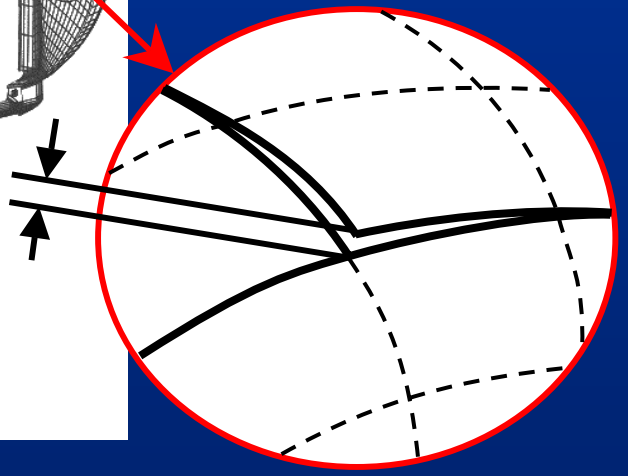
Example of a CAD quality problem





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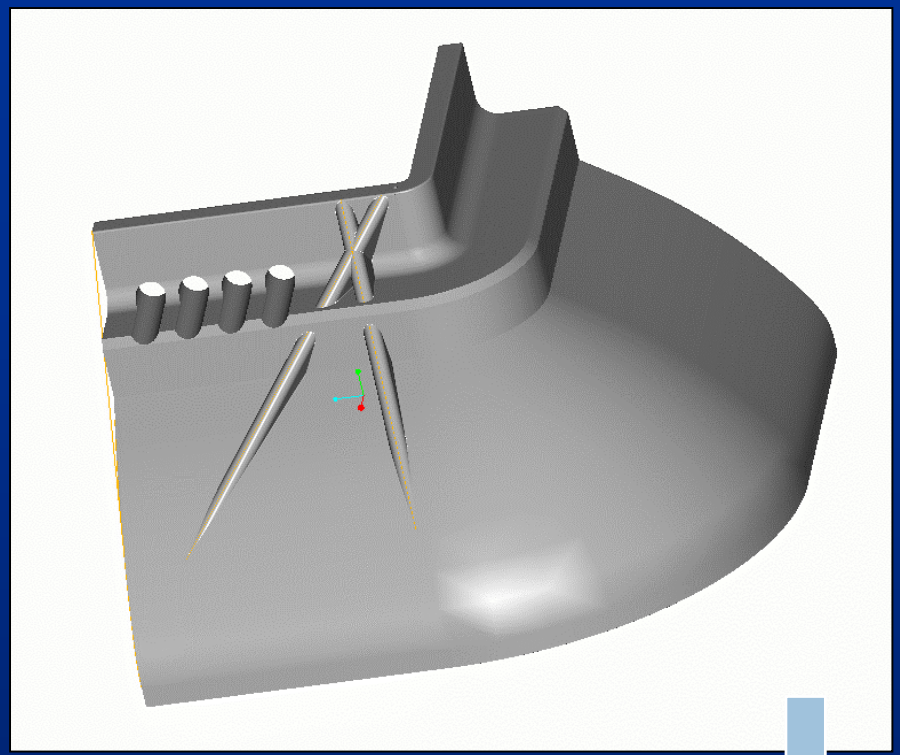
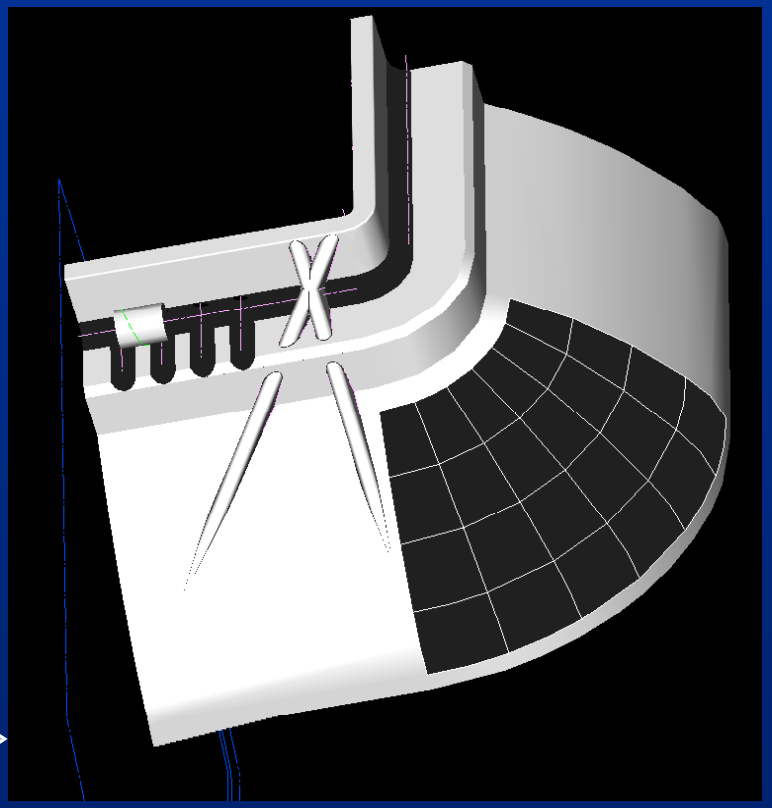
Example of a CAD transfer result





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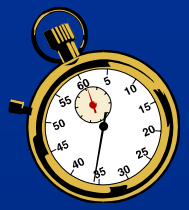

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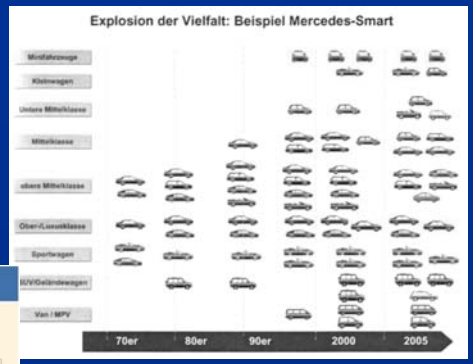
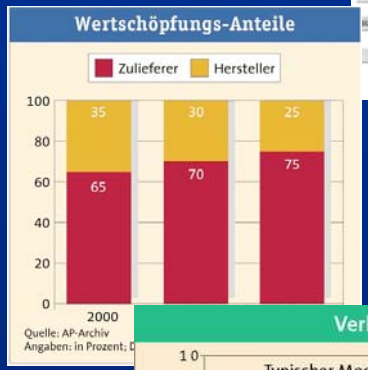
Business Case Basics

- A significant share of automotive turnover is generated by new models/types with new features ...
- ... in a complex automotive network ...
- ... while development and manufacturing cycles have to break time reduction records from year to year!





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Business Case (german automotive manufacturer)

- The calculation elements of this (simple) approach:
  - No. of types developed per year
  - No. of CAD models per type
  - percentage of CAD models with bad PDQ
  - No. of hours needed to correct a CAD model
  - € per hour

- Cost = 10 * 1.000 * 80% * 2h * 60€/h
  = 960.000 € per year

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Goals of the PDQ initiative

- Mission: To describe (neutral) PDQ criteria to ...
  1. define PDQ
  2. visualise PDQ
  3. avoid bad PDQ
  4. remove bad PDQ
- Milestones:
  - create and use common PDQ terminology
  - support guideline transfer into company standards
  - initiate checktools and force their usage
  - unify checktool results (1 tool for n partners)

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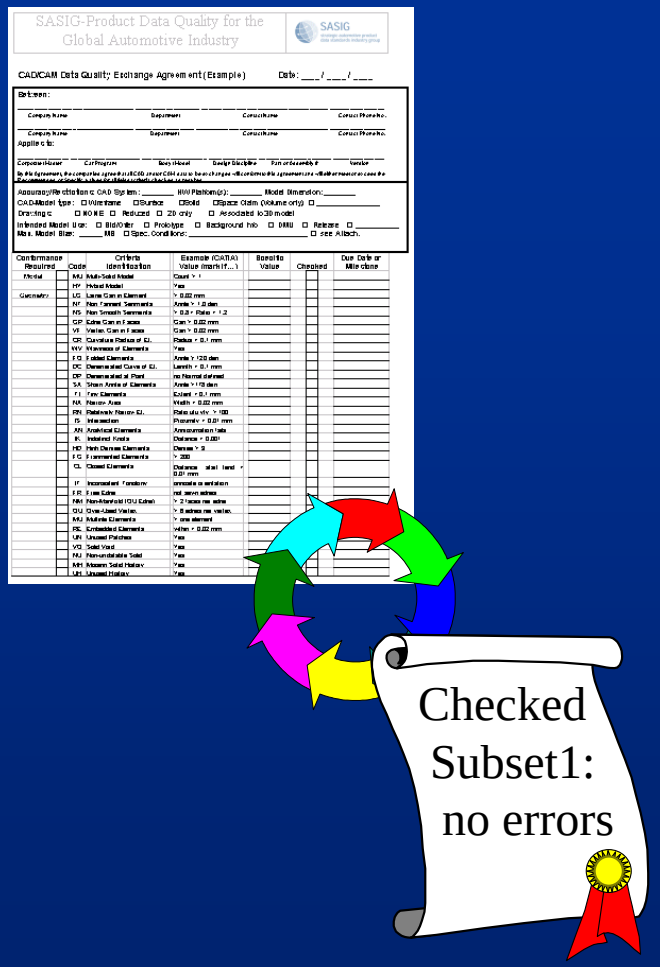
PDQ strategy

- Agree on a useful subset of PDQ criteria and limit values
- Check PDQ regularly during creation
- Revise faulty methods and increase user skills
- Document PDQ when sending/archiving a CAD model



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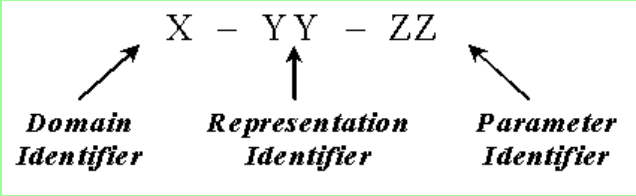
Content

PDQ Guideline V 2.1

- **Introduction and Background**
- **PDQ criteria**
  - Encoding system
  - Geometric quality criteria (64)
  - Non-Geometric quality criteria (63)
  - Drawing quality criteria (19)
  - CAE quality criteria (13)
- **Quality stamp**
- **Improving PDQ**
  - Readiness for change
  - Product development process
  - Supplier roles
  - Skills and Motivation
  - Checking Tools
  - Healing
  - …

Encoding system:



e.g. **G-CU-LG**
O-GL-NL
D-GE-TI

- **Attachments**
  - Glossary
  - Mapping between element types
  - (Recommended values)
  - Formsheet
  - SASIG-Odette Cross-reference
  - Business case
  - Revision request

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Criteria description

- Each criterion is described by
  - a Problem description, the measurement,
  - additional Supporting information,
  - a Recommendation (to avoid or remove the problem),
  - and a picture to illustrate the criterion.

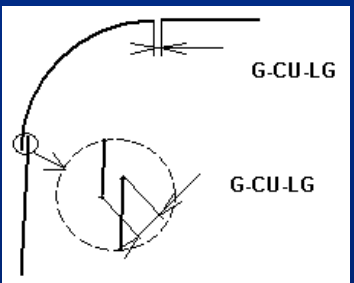
3.1.1.1 Large segment gap (G_0 discontinuity): G-CU-LG

Problem description: Large distance between or overlapping of adjacent curve segments - a G_0 discontinuity.

Measurement: Distance between segment endpoints at common bound.

Supporting information: The first and most important continuity issue is "position continuity," i.e., the transition of curves and curve segments without gaps and/or overlapping end points. A position discontinuity endangers follow-up operations that build upon the unity of curve paths, especially after scaling, offsetting, or transfer.

Recommendation: Position discontinuities are to be rectified by limiting the affected curves to one another within the tolerances. A possible, necessary extension or trim of one or both elements is preferred.



Example: Large segment gap (G_0 discontinuity)

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Example of a Non-geometric quality criteria

3.2.2.7 Number of layers exceeded: O-GL-NL

Problem description: Layers are used to organise geometric elements describing a part. Usual operations (like visualise, hide, move, or copy) of elements on layers are much easier than with single elements.

If data organised with layers are loaded into an application (e.g., CAE pre-processor) that is not able to read layers, this might lead either to a loss of information or extra workload to create a new structure.

Measurement: Check the number of layers used.

Supporting information: Number of layers shall be limited to 254 layers or fewer. This is the recommendation based on the maximum number of layers specifications for major CAD systems.

Recommendation: Use a number of layers compliant to the company standard

- The Non-Geometric and Drawing criteria descriptions do not provide a picture

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Experience Report

- CAD users know PDQ and ask for it
- about 10 PDQ checkers are available
- CAD system vendors pay attention to PDQ
  - offer own PDQ checkfunctions
  - correct CAD concepts and functions
- Companies establish own PDQ guidelines, agreements and checks (with link to VDA and/or SASIG doc.)

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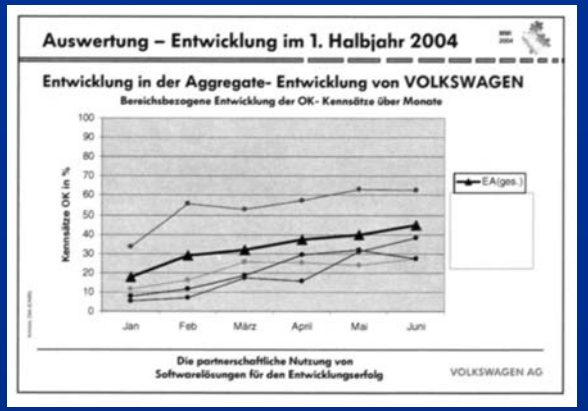
Experience Report

- Companies establish PDQ statistics when receiving CAD models,
- CAD data exceeding a defined quality value or violating major quality criteria is rejected.



- Supplier‘s PDQ statistics are used as a criterion when placing orders.
- Companies with such procedures recognise significant increase of good PDQ and ...
- confirm to save time and money!

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Next Steps (for SASIG WG PDQ)

- Focus on “Roll-out“/Deployment
  - presentations, success stories,
  - perform ISO PAS procedure
- Establish a global checktool conformance procedure,
- intensify CAD developer dialogue,
- perform PDQ survey regularly to monitor success of the PDQ initiative,
- perform guideline maintenance.

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Next Steps (for YOU!)

- Visit www.sasig.com or contact lutz.voelkerath@prostep.com to receive SASIG PDQ guideline V2.1,
- build the business case for your company (define starting point to show progress),
- perform PDQ improvement and statistics,
- and save time and money, too!

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End

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Backup

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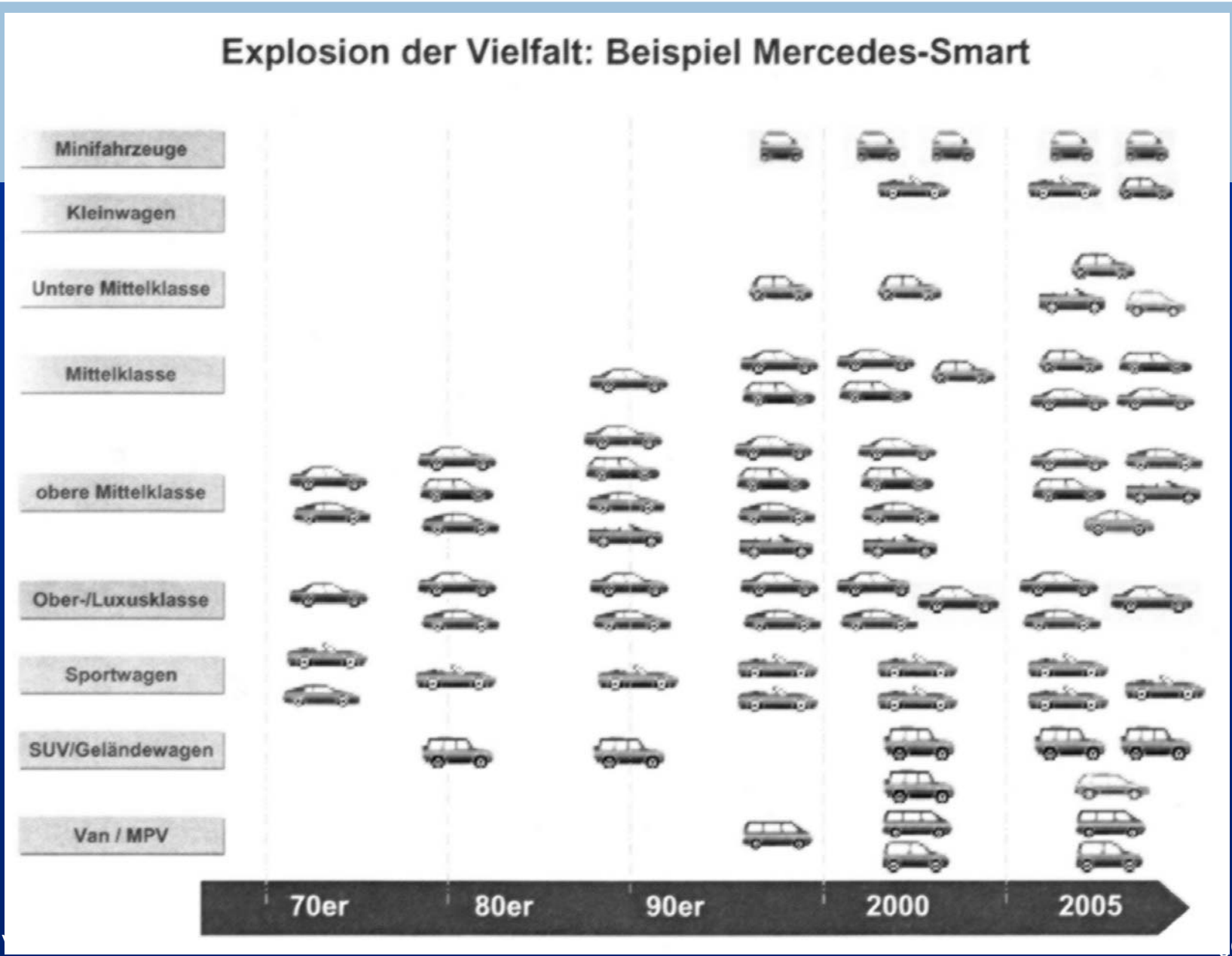

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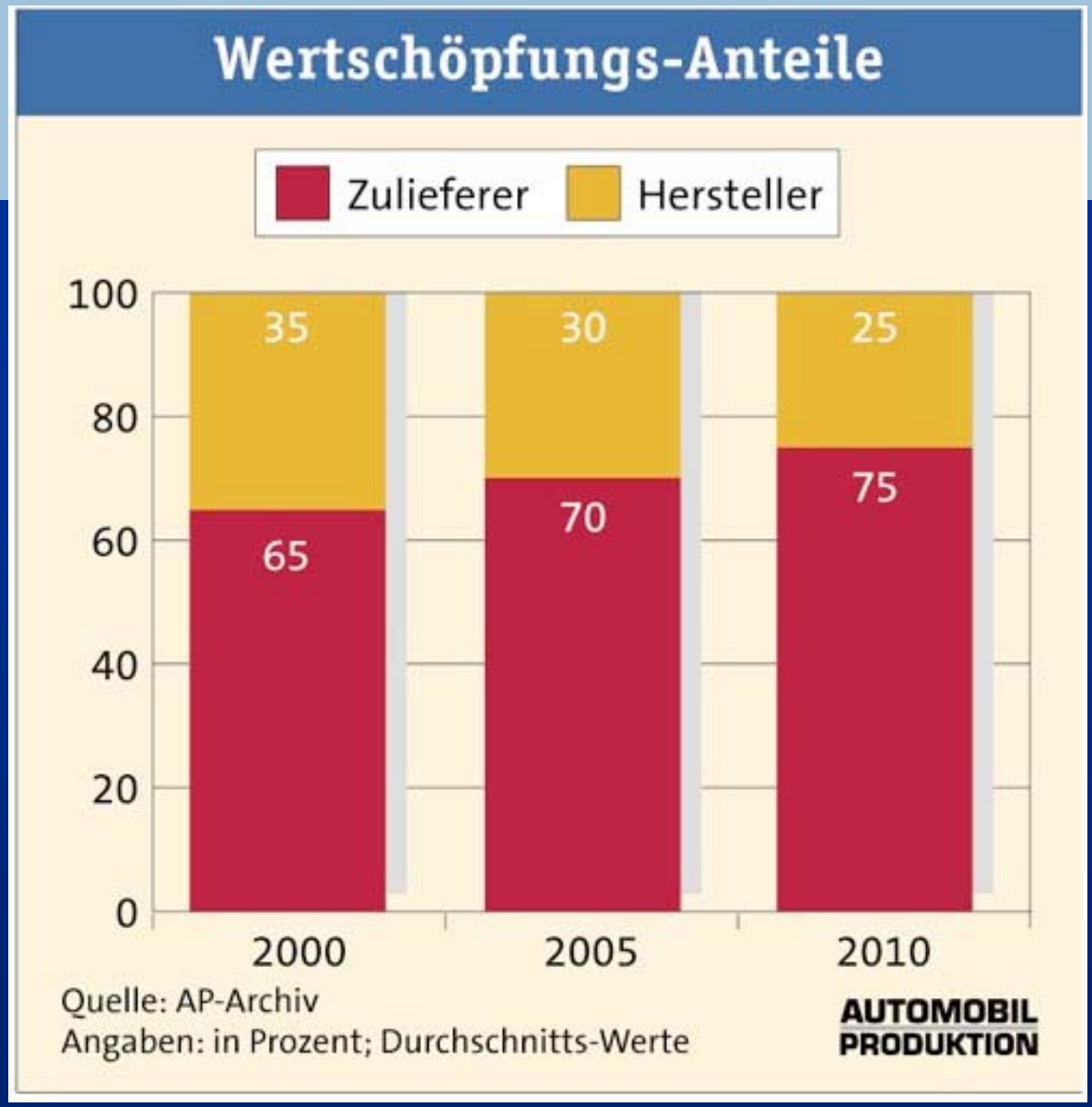

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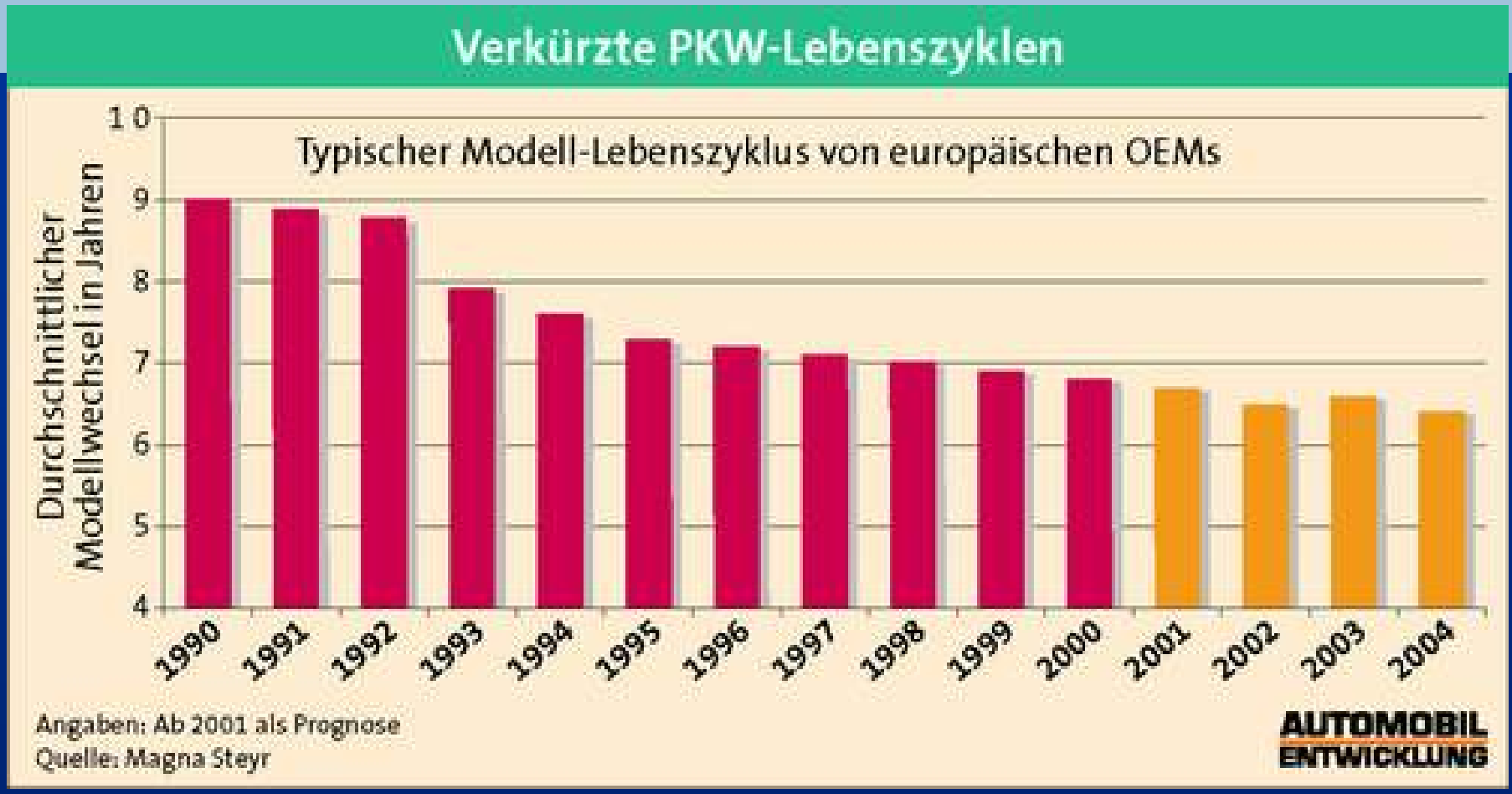

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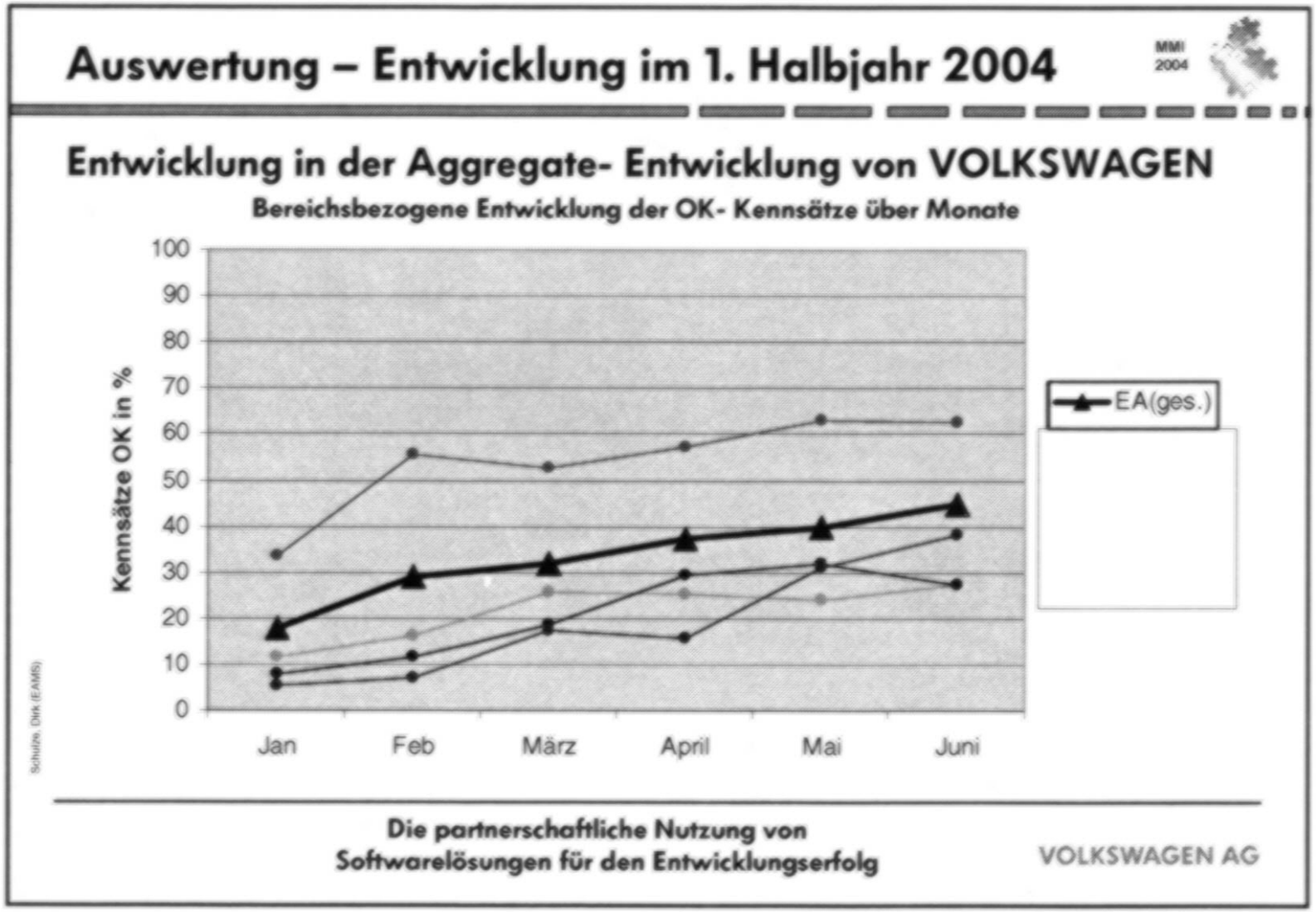

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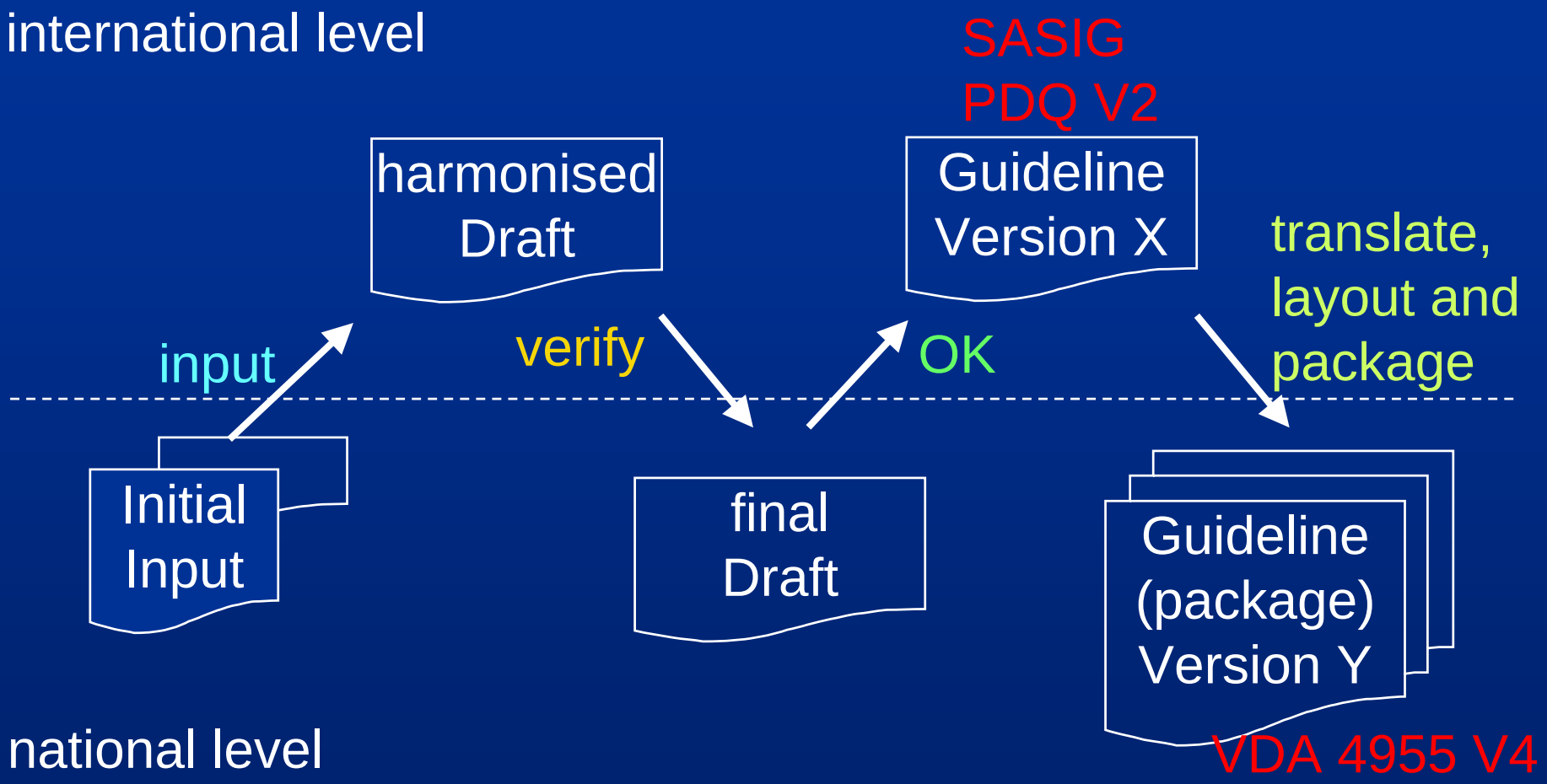
SASIG Guideline migration path



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SASIG PDQ conformance procedure

- Goals: Ensure …
  - completeness of checktools reg. SASIG criteria,
  - comparability (equality) of checktool results
  - to allow users to use 1 checktool for n partners.
- Milestones: (C=Candidate, WG=work group)
  - C perform checks with documented checkmodels
  - C fills result form (spreadsheet)
  - WG publishes result on SASIG Homepage