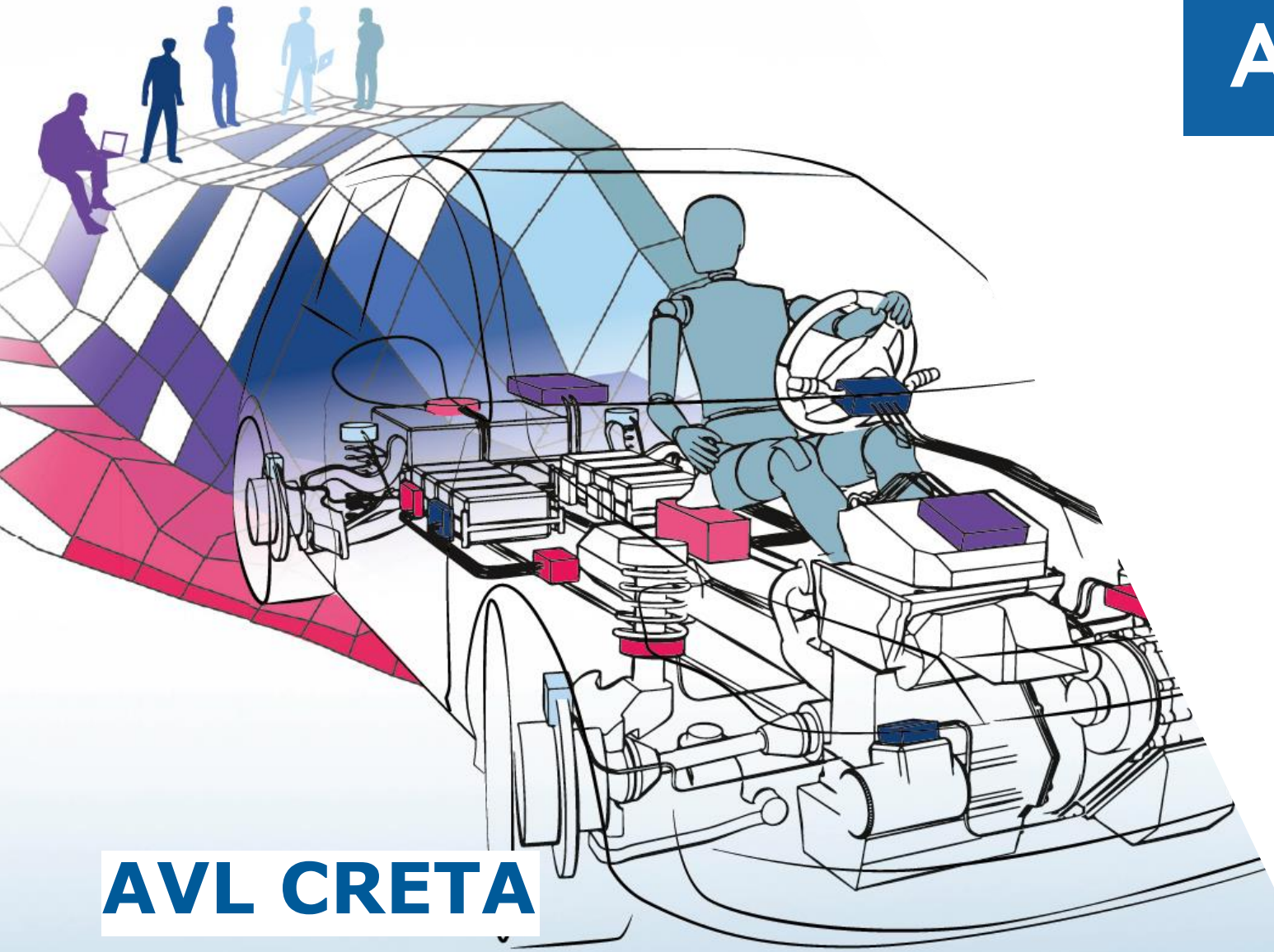


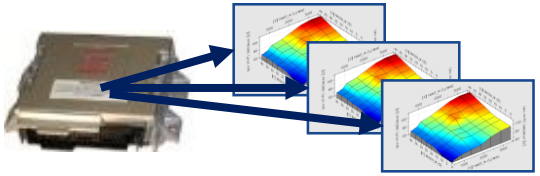
AVL CRETA

Calibration Lifecycle Management

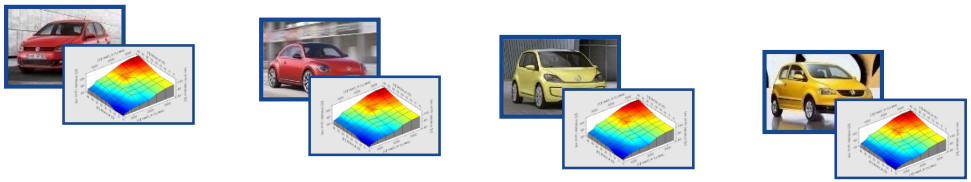
Nikolas Schuch
AVL List GmbH

WHAT IS AVL CRETA?

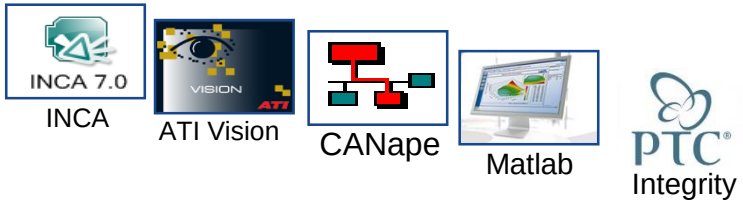
- AVL CRETA supports the Control Unit Calibrators in managing the huge amount of calibration parameter variants



- It secures that the right calibration set goes into the correct vehicle



- It connects seamlessly to the customers development process and environment, e.g.



- It is the Market Leader in automotive Calibration Data Management

SYSTEM HISTORY

- AVL CRETA -

- CRETA was designed as **Calibration Management Tool** from Calibrators for Calibrators
- The System Architecture was **focused** on the **Calibration Use Case** and handling of Calibration Labels even when offline or on slow networks abroad
- **Performance** of the system is optimized to **calibration management** and the use cases of the single calibrators
- The **usability** and concept of every dialogue and feature was driven by two OEM's and two Tier-1 suppliers.
- **Easiness** of use was always our focus as it saves a lot of time for training and increases the **acceptance of the team** for a new system.

VEHICLE CALIBRATION TODAY

Many Control Units or
Central Control Unit for braking, steering, damping, safety…

>50.000 Parameters

Different Vehicles, different brand, different customer segment, different packages, different market

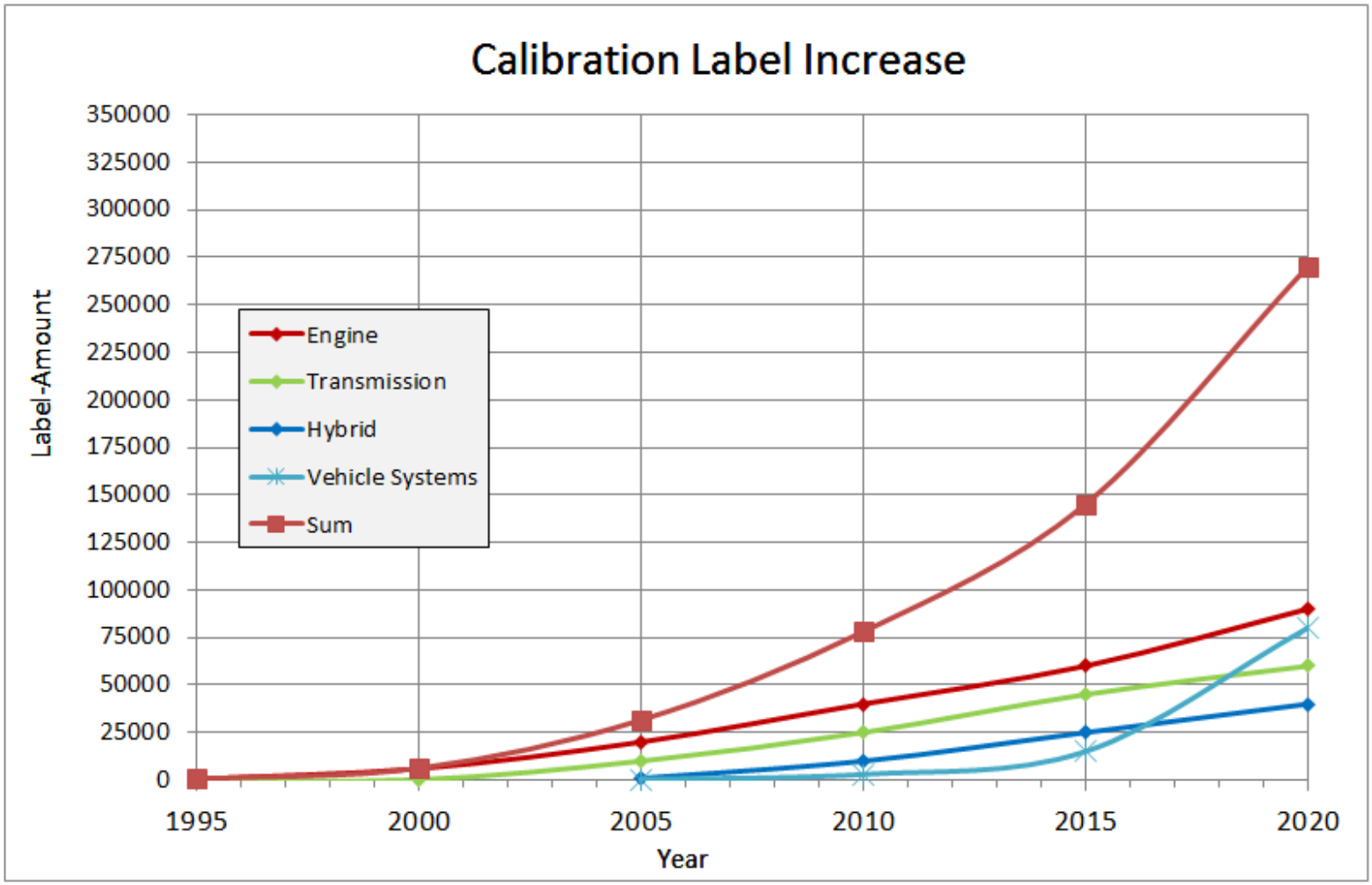
~150 Vehicle Variants

Many engineers with different Calibration Knowledge

~3-50 Development Engineers

Project Duration: 6 -18 Months

HOW MANY LABELS NEED TO BE CALIBRATED IN 2020?



We assume that there will be around 750 Calibration Variants per Engine in 2020!

CRETA THE MARKET LEADER

Our customer use CRETA across all calibration areas from engine to chassis:

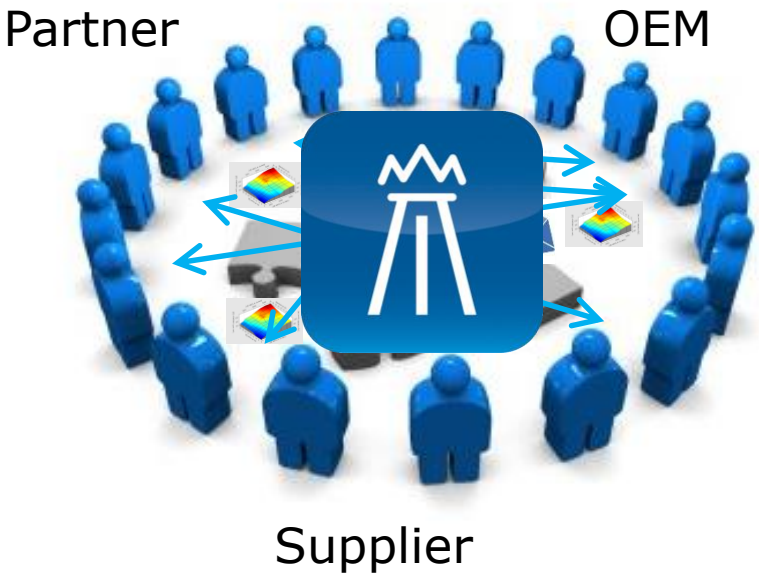
VW, Audi, Toyota, GM, Daimler, Renault, PSA, Ricardo, BEG, Continental, Delphi, Denso, Navistar, Porsche, MTU, Honda, Jaguar, Land Rover, Yanmar, Valeo, Mazda, Agco Sisu Power, Hino, Volvo Powertrain, Mack Trucks, Daihatsu, Ina, Luk, AMG, Liebherr, Lombardini, Mahindra, TRW, Doosan, IHI, Avtovaz, Wabco, TATA, BWI, Woodward, Mclaren, Eaton, Aichi, BMW Motorbike, BRP Rotax, MWM, JAC, Daimler China, GWM, Wuxi Diesel, GE, SDF,

Number of today's users: > 10000

Feedback from customers:

- ⇒ Simple and clear Structure
- ⇒ High maturity in functionality
- ⇒ Easy Installation
- ⇒ High performance

AVL CRETA CALIBRATION LIFECYCLE MANAGEMENT



CRETA shares Data and Information

CRETA manages Tasks and Responsibilities

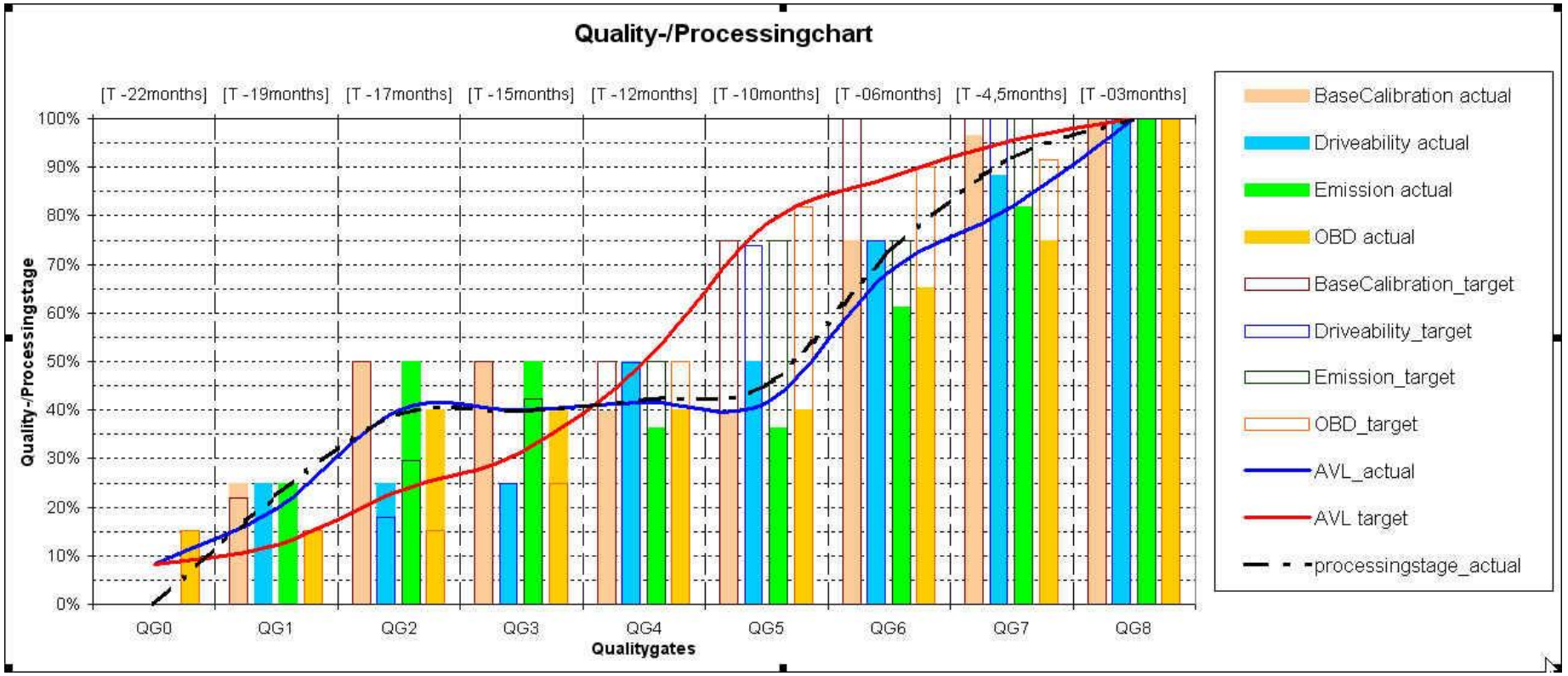
CRETA knows the Processes

CRETA keeps your projects in the lead

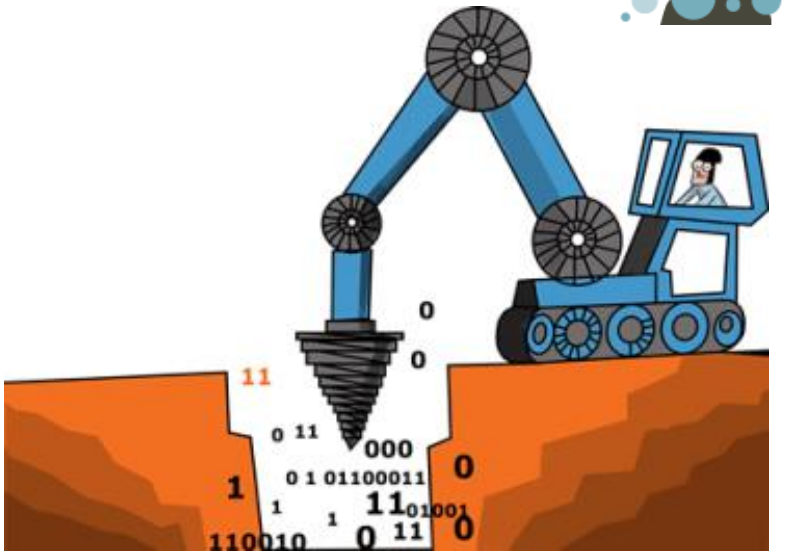
CRETA Data Mining

Project Status Control

Manage the project status with AVL CRETA and always stay in the lead to control your Calibration progress!



DATA MINING



Understanding your own data

Learning from your data

Create knowledge out of data

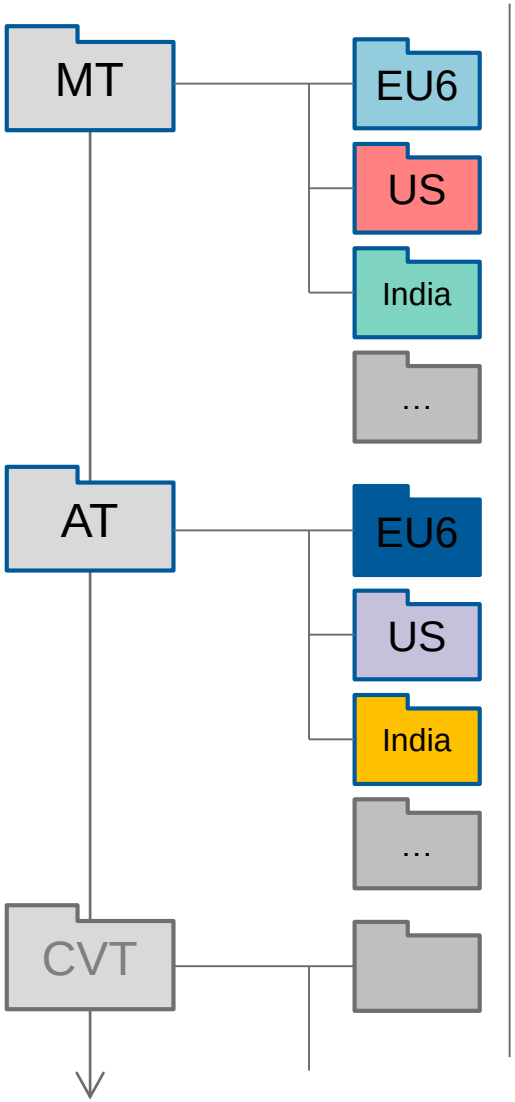
Finding outliers and mistakes – Help Engineers

Re-Use Calibration Data in a Library

CRETA
DATA MINING

Up to **500 or more**

Variants Analysis

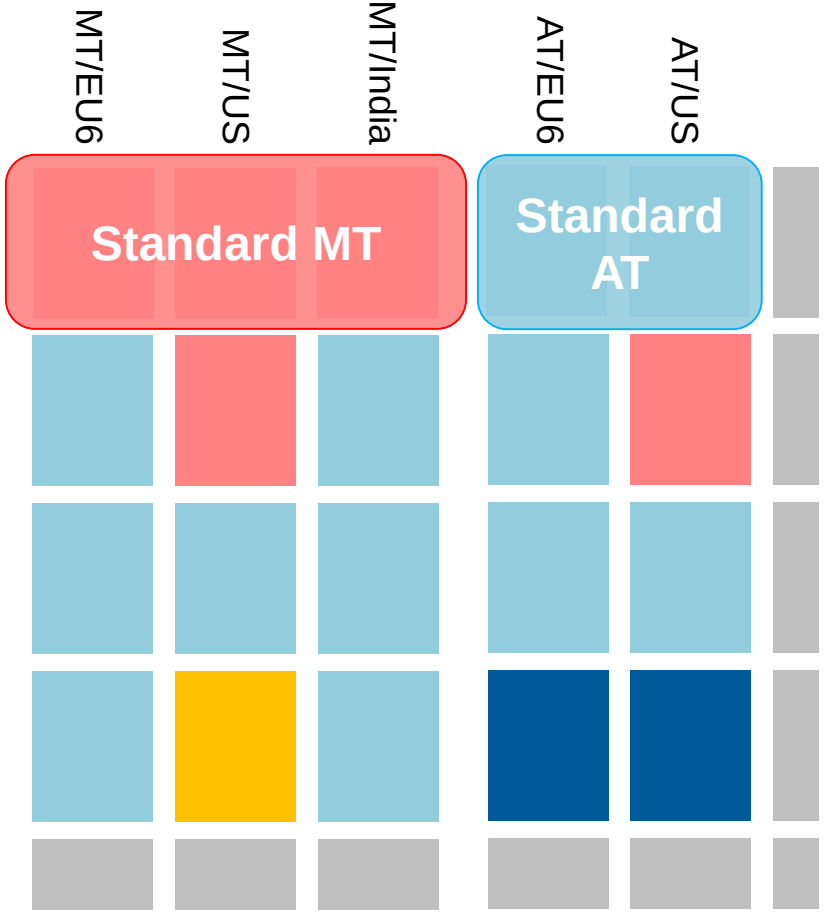


Lambda-Sensor

Tank leakage-diagnostic

Exhaust Temperature Model

Secondary air



AVL CRETA TEAM

Product Management
Content Management
Project Management
Business Development

4 People

Development
Usability & GUI Design
Research

18 People

Testcenter
Quality Assurance
Documentation

8 People

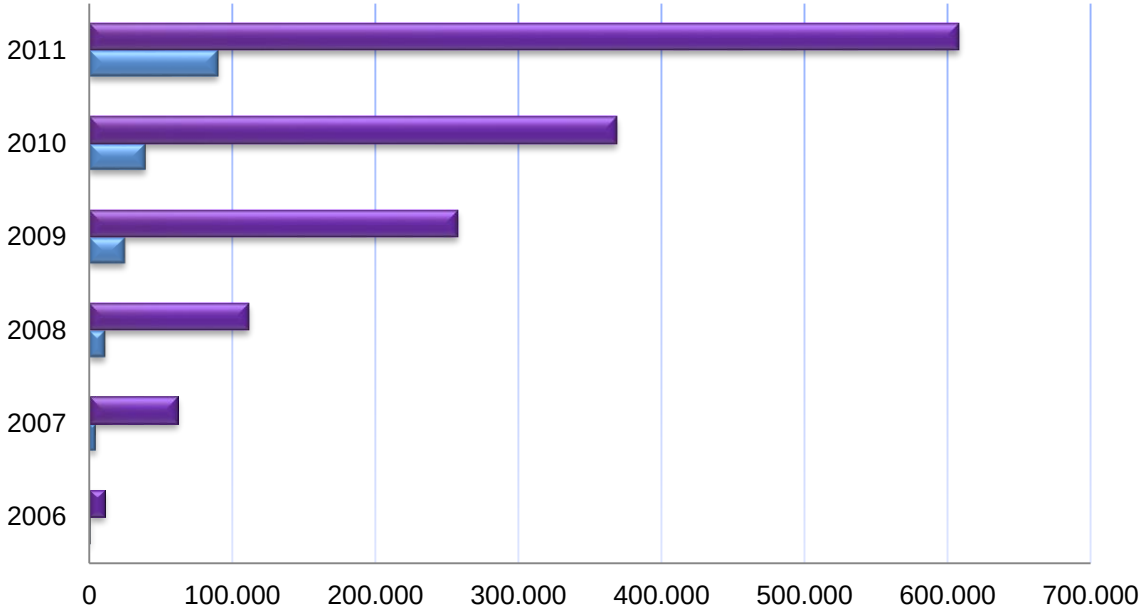
Hotline
Personal Agents
Customer training

10 People

PERFORMANCE

Users: 1725
Projects: ~90

Locations:
Ingolstadt (Server)
Neckarsulm
Wolfsburg
Czech Republic
Spain
Brasil
China

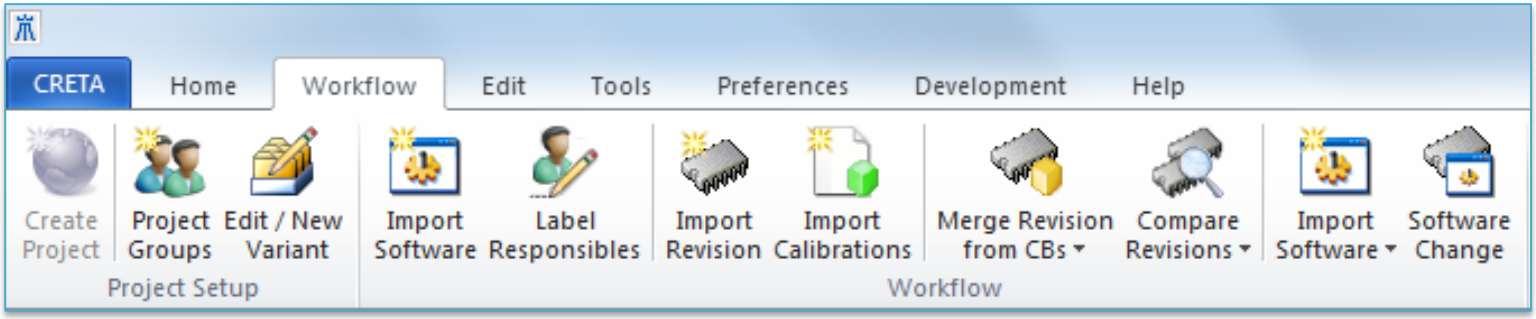


	2006	2007	2008	2009	2010	2011
DCM, PaCo, CDF	10.512	61.539	111.412	257.709	368.995	607.711
HEX / S19	1.047	4.739	11.129	24.915	39.366	89.884

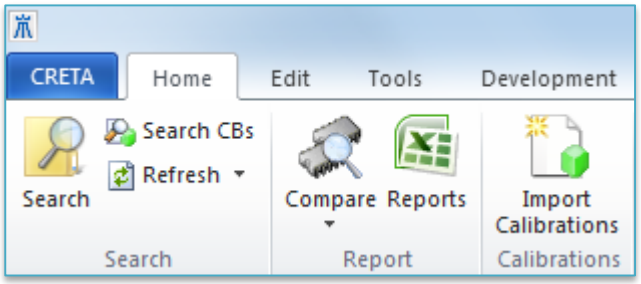
(Source: AUDI, Jan. 2012)

- All historic data available on one klick and able to be compared.
- Features which are heavily used are constantly optimized in terms of performance
- Access Right Management according to actual IT Standards via Card Spaces & Multi Tenant access possibility as well as data encryption.

USABILITY



CRETA Main View for Calibration Managers

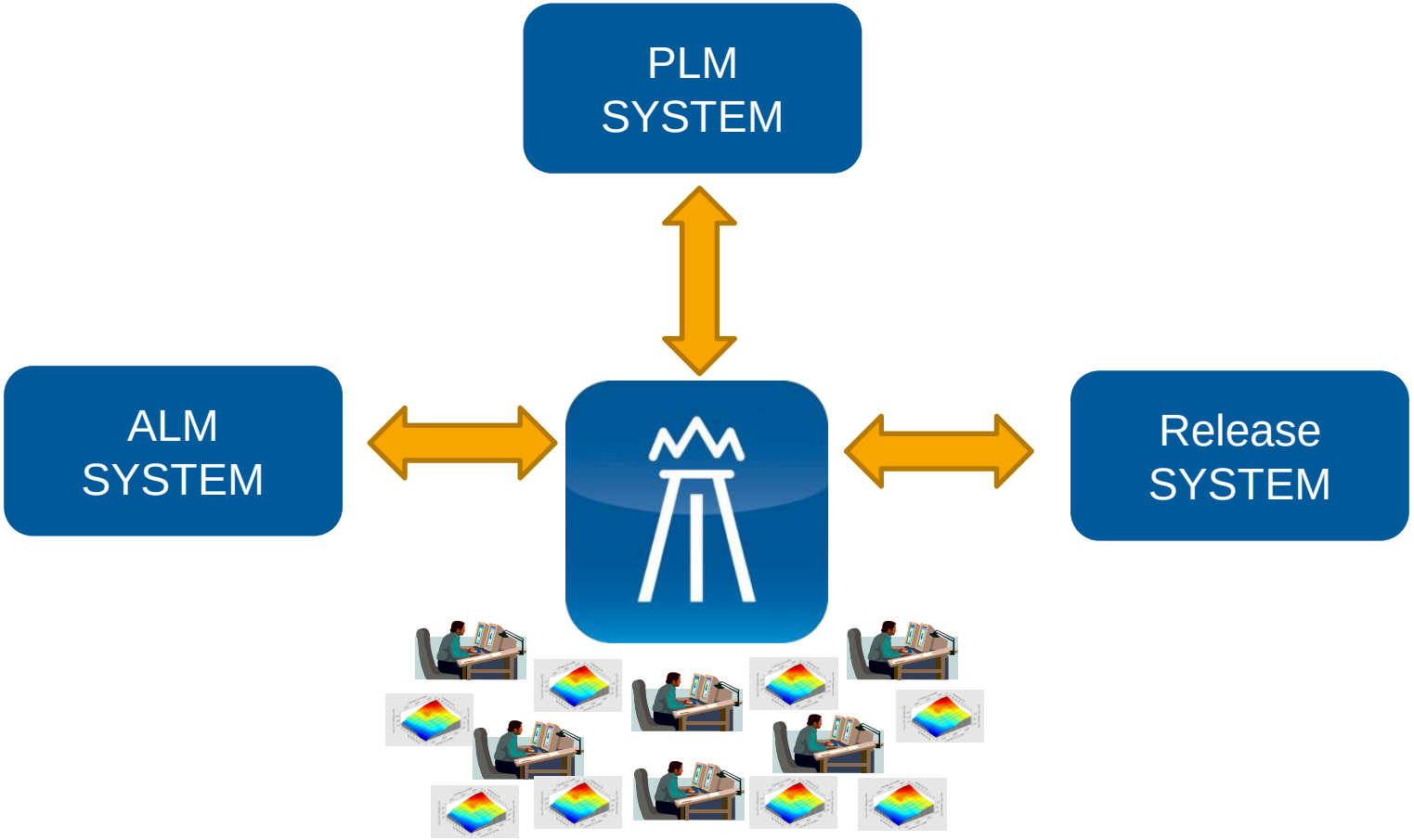


Simple view for Calibrators

Feedback Customer Germany:
"CRETA is the only tool which doesn't need continuous training of employes"

CRETA INTEGRATION AT CUSTOMERS

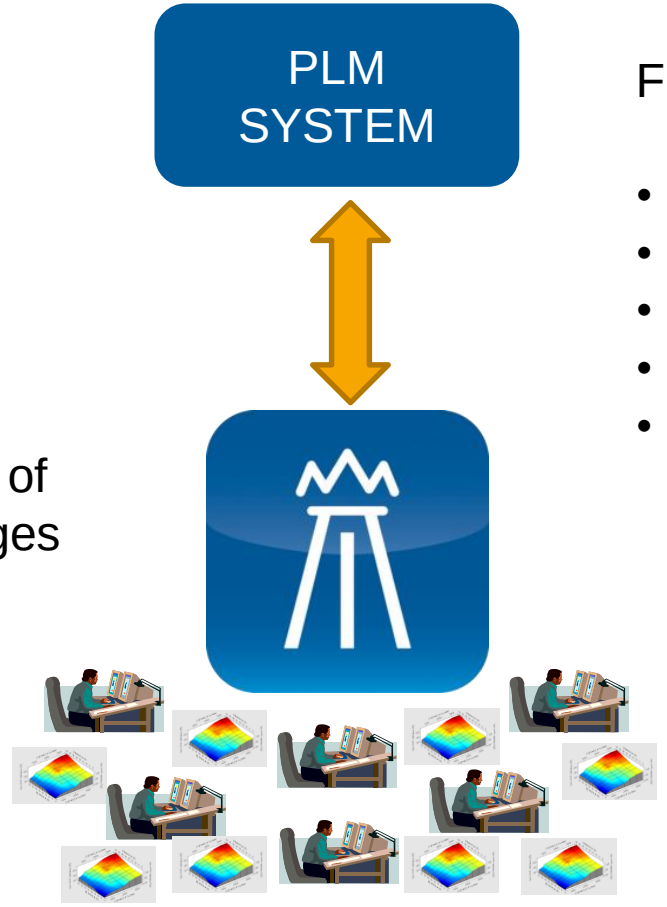
At most customers CRETA is interconnected into the Development Process and Lifecycle Systems!



CRETA – PLM SYSTEM

FROM PLM to CRETA:

- Part Numbers
- Variants
- Attributes
- Milestones/Deadlines
- Deliverables
- Fast updates in Case of Product Scope Changes



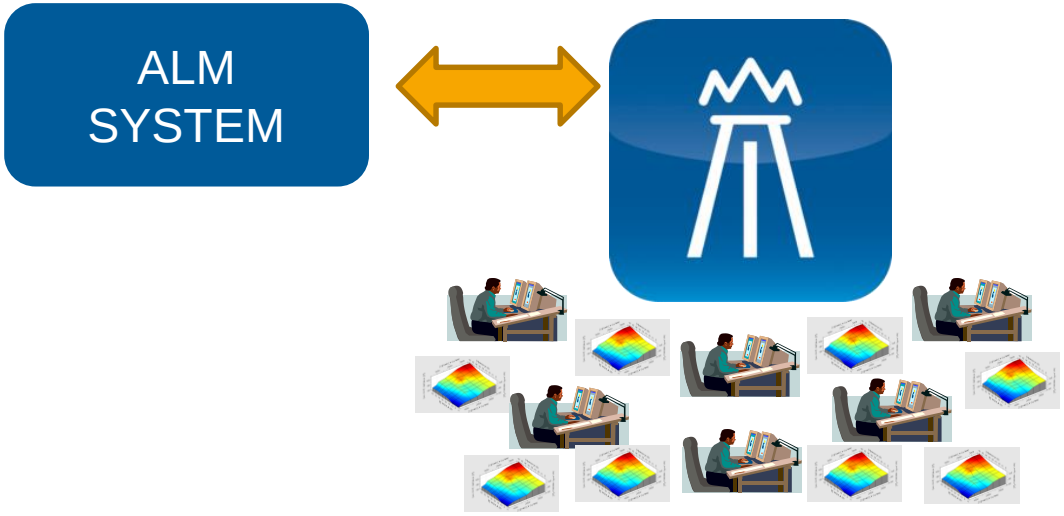
FROM CRETA to PLM:

- Variant Status
- Project Status
- Requirement Status
- Updates in Variants
- Part Number Requests

CRETA – ALM SYSTEM

Connect the xCU Software Development Process with Calibration

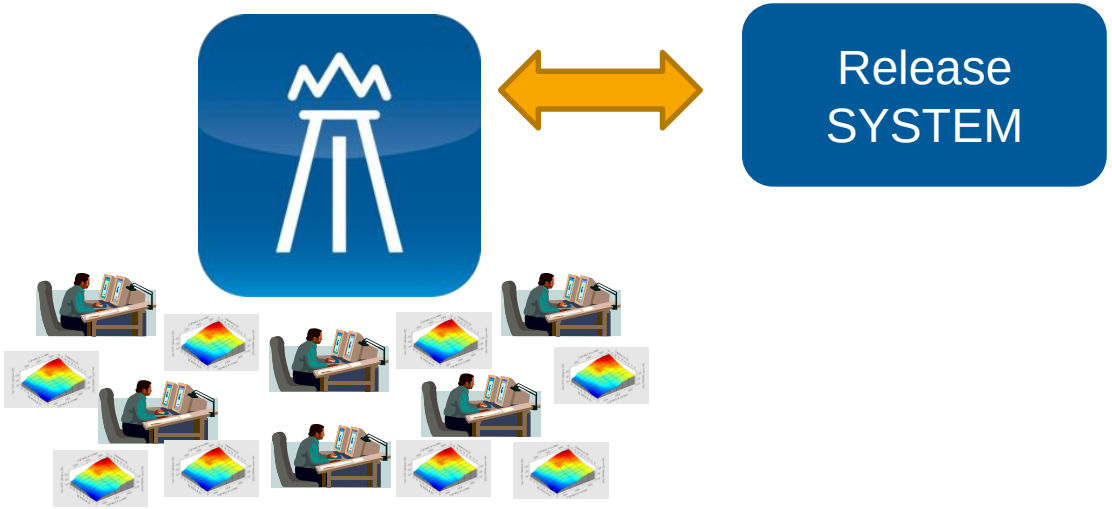
- Automatical and timely exchange of new Software Builds
- Information about changes and comparisons
- SW Bug Submission and monitoring
- Fast Feedback between SW Development & Calibration



CRETA - RELEASE SYSTEM

Calibrations in a final stage are transferred to a Release System

- Automatical data transfer of defined Datasets/Variants
- Sign Off Procedure
- Final Dataset Checks
- Feedback Loops in Case of Corrections or Errors

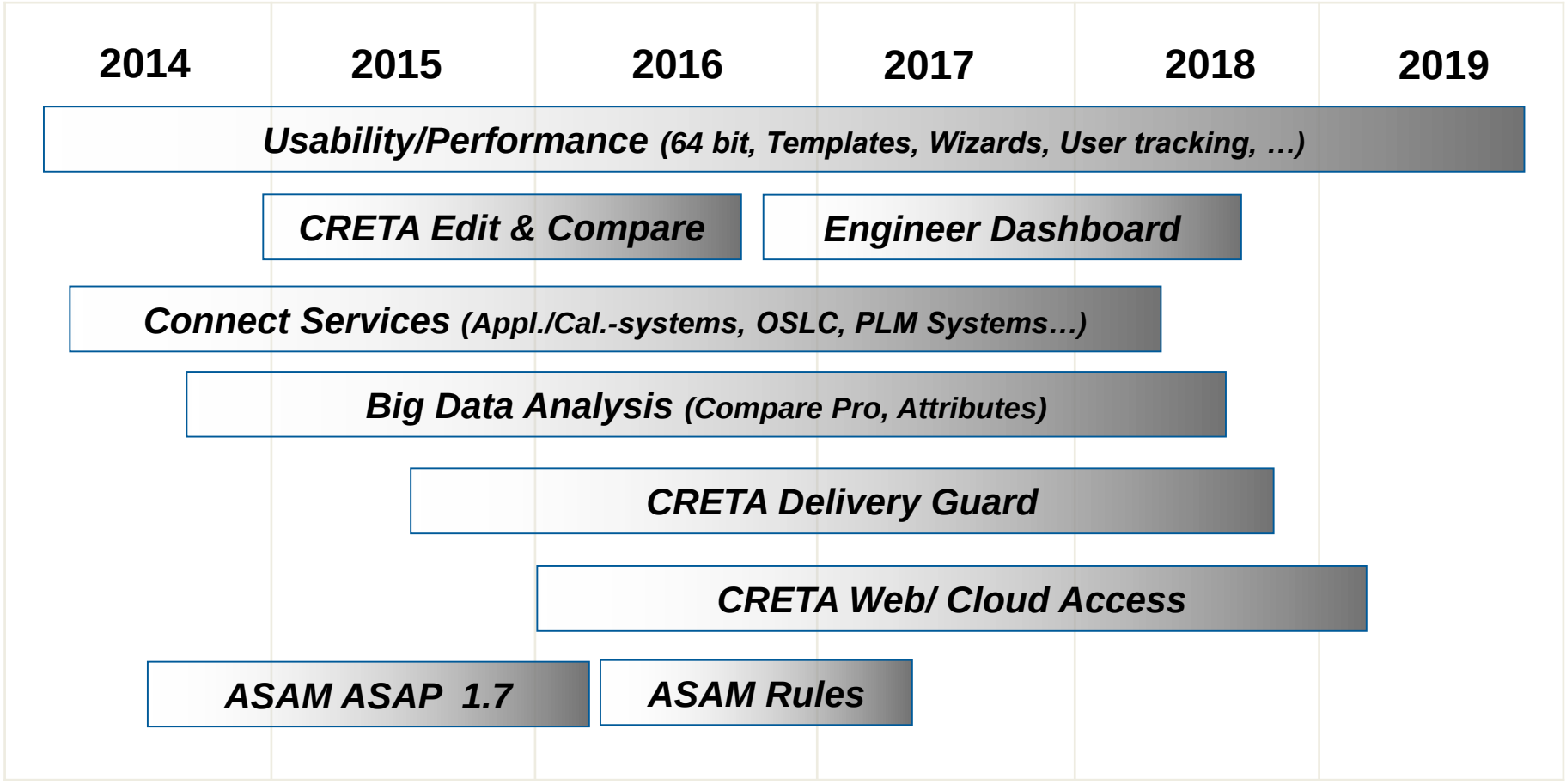


CUSTOMERS VOICE ABOUT CRETA

- AVL CRETA gives us confidence about the final calibration Result and Quality we deliver
- The amount of reflashing in the field has drastically reduced, due to much less errors or mistakes in the compiled calibration
- It would be impossible to release 100.000 Datasets a year without AVL CRETA’s checking and security methods
- AVL CRETA enabled us to improve our Variant consistency and helped us to be more flexible when calibrating new and more variants
- AVL CRETA reduced our Calibration Management Effort by more than 60%!

R&D Roadmap / Outlook 5 Years

As Market Leader we develop our Roadmap together with our customers:



CUSTOMER'S VOICE ABOUT CRETA

"Maximum spread between performance and driving comfort"

Dr. Manfred Harrer (born in 1972) has been Director of Development Driving Dynamics and Performance at Porsche in Weissach since June 2012; he is responsible for the series development of all Porsche models. After completing his studies at the Munich University of Applied Sciences, Harrer began his career in 1997 at Audi in Ingolstadt as a chassis test engineer for engine mounts. At the same time, he worked with now-Prof. Dr. Peter Pfeffer in England on his Ph.D. thesis about "Characterization of Steering Feel." He received his degree from the University of Bath in 2007. In 1999, Harrer changed from Audi to BMW, where he was most recently manager for transverse dynamics and steering in Predevelopment. In 2007, he joined Porsche as manager for steering systems and wheels; in 2011 he was promoted to manager of chassis control systems. Harrer is also the publisher and co-author of the steering manual in the publishing company Springer Vieweg.

Porsche is currently involved in a demonstration project. With Calibration Data Management, called Creta for short, AVL has developed a good software tool including structure for checking data in and out, including processing, archiving, and the history behind this.

We also use this in the chassis sector, but we have adjusted the tool to suit our concerns. This kind of work is unique on the scene, I believe. Synergies could be realized.

ATZ Article, 06-2015

TOP 5 REASONS
WHY CUSTOMER CHOOSE AVL-CRETA

There are hundreds of reasons why more than 60 customers chose CRETA over Competitor Systems after a evaluation. Here is a short summary of the main reasons derived from customer feedback:

Leadership	We are the leading provider of Calibration Lifecycle Management ▪ **10000 Users** ▪ Future Proof and used across all domains: ▪ Engine, Transmission, Hybrid, Chassis, Brake, ADAS, Vehicle cabin appliances…
Innovation	▪ **We have the biggest dedicated development team** ▪ We collaborate with our customers & PLM/ALM Suppliers for new innovations ▪ Continuous delivery of improvements and new features ▪ Every customer benefits from each process improvement of each our customers globally ▪ We invent and research new approaches to support correct datasets of our customers: Patents like: **Optimized calibration data storage** (Patent Nr.: PI10534WO & AV-3485 WO)
Focus	▪ We have the in-house calibration experience for fast feedback and optimization of the user experience ▪ We support the most file formats available on the market: Our dedicated goal and product strategy is to support Calibration Engineers with all they need e.g.: (Denso SET, A2L, ROB, ATI)… ▪ **Because of the intuitive GUI Engineers make no mistakes in using the system which increases the dataset Quality significantly**
Data Storage	▪ Storage of A2L and HEX/S19 is doublechecked during saving of files in the database ▪ **Proved VPN support over low bandwith networks (<2 MBit/s)** ▪ INCA and Canape are the primary testing environments: We are in an constant exchange to ensure compatibility and data correctness at all costs
Costs	▪ **Deployment / Installation time (<30 minutes)** ▪ **System Uptime: twice as high as competitor systems because of low infrastructure required** ▪ Oracle and SQL-Server supported with complete freedom to choose (Version and Vendor) No specific Oracle version required, even Microsoft SQL server supported ▪ Lower Training Costs because of simple GUI ▪ Our Support Organization are experienced calibration Engineers

AVL CRETA

TRUST YOUR CALIBRATION POWER

Contact for further Information:

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Download a free Demo Version on:

www.avl.com/creta