

SCALE

Brief Introduction of Company and Products

October 2014

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Agenda



Brief Introduction



Overview Software Products

SCALE / DYNAmore GmbH - Introduction

- DYNAmore in total ~95 people

- HQ in Stuttgart

- Branches

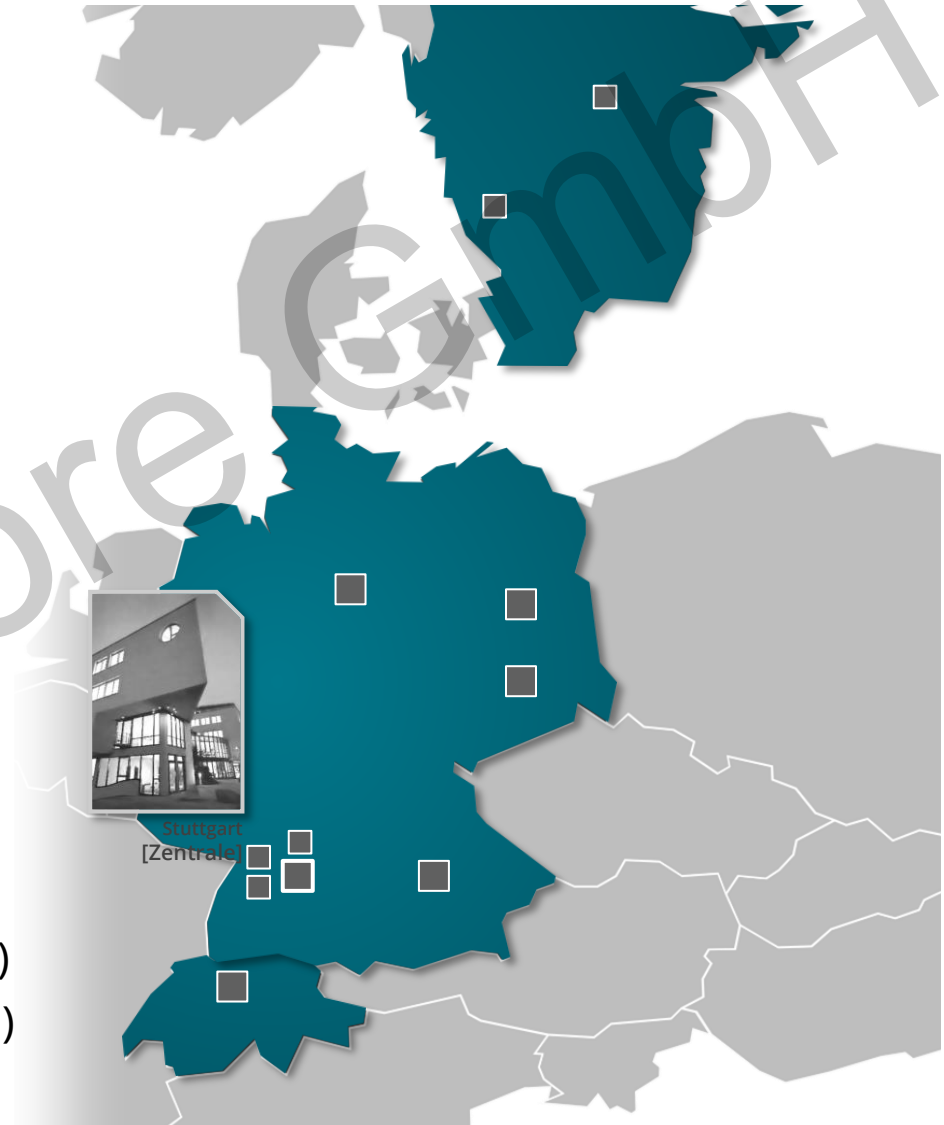
- Dresden
- Ingolstadt
- Berlin
- Langlingen (Wolfsburg)

- On-Site Offices

- Sindelfingen / Untertürkheim
- Ingolstadt / Neckarsulm
- Weissach

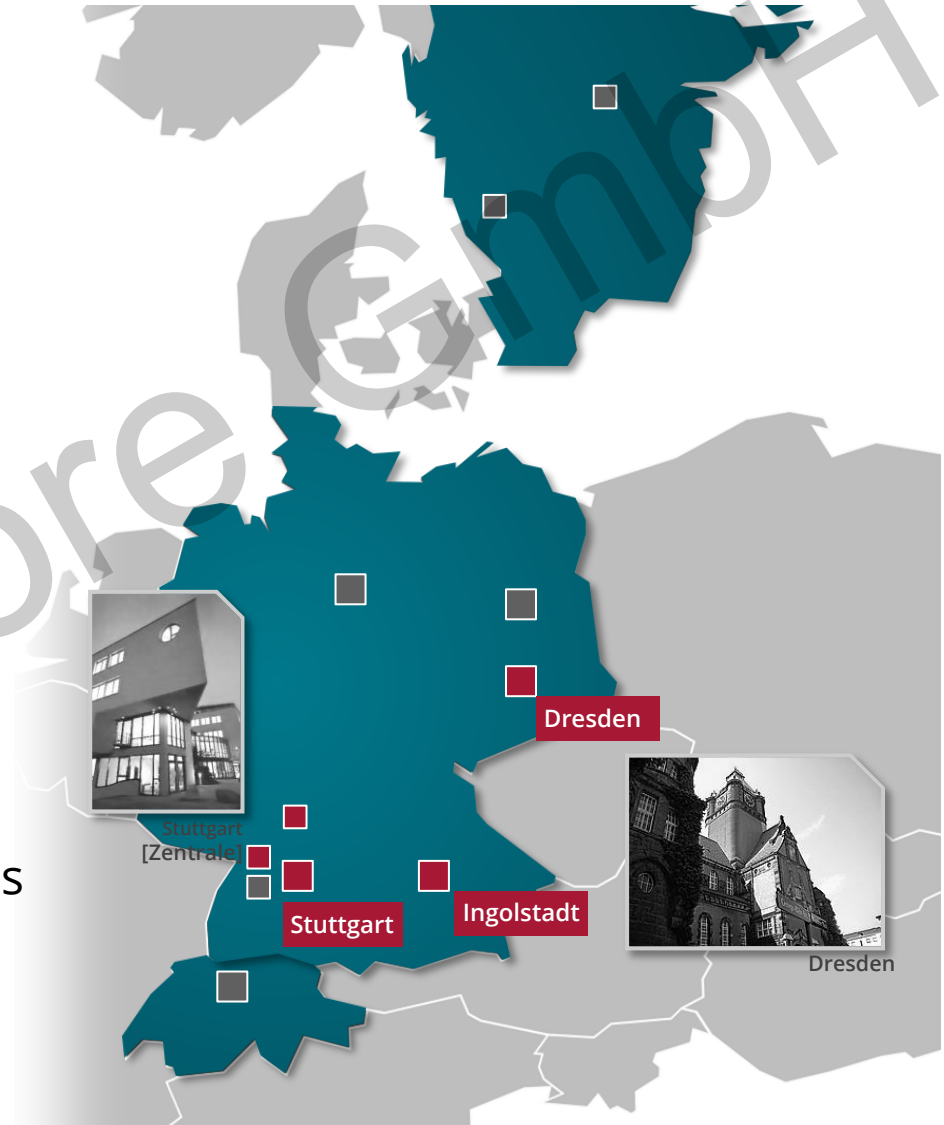
- Subsidiary

- DYNAmore Nordic AB (Linjöping, SE)
- DYNAmore Swiss GmbH (Zürich, CH)
- DYNAmore Italia S.r.l. (Turin, I)



SCALE GmbH

- Start of SCALE GmbH at 2014-09-01
- SCALE is a 100% subsidiary of DYNAmore
- Currently 25 people (engineers and computer scientists), dedicated to „CAE process-, and data management“
- Offices
 - Ingolstadt
 - Dresden (Software development)
 - Stuttgart
- SCALE stands for "Scalable Solutions in Simulation Data and Process Management"



Agenda



Brief Introduction



Overview Software Products

Overview Software Products

■ Information

- The software solutions have been developed in the last 10 years in close cooperation with AUDI
- The development was carried out hand-in-hand with engineers from simulation departments with main focus on usability
- The software can be licensed as a standard solution for simulation data and process management
- On this purpose, the SCALE GmbH was founded.
SCALE provides support, training, development, maintenance, sales, etc.

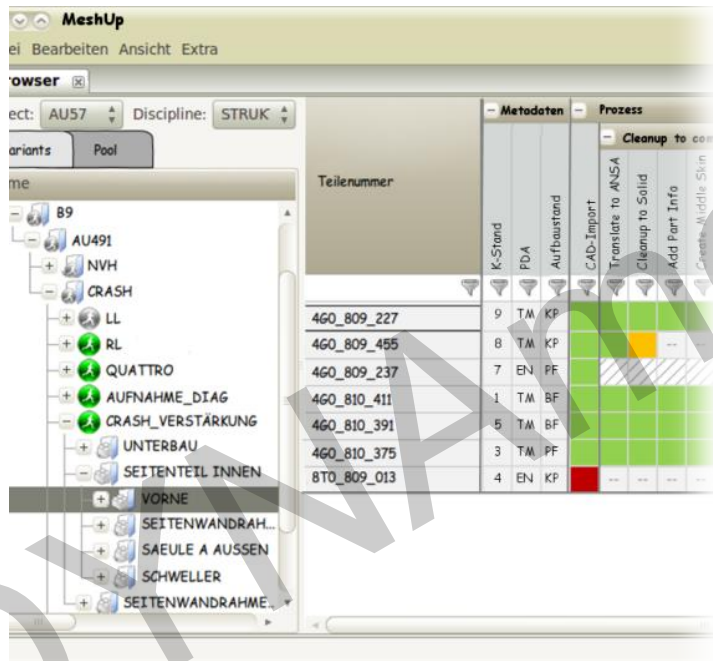
CAD/Meshing

PreProcessing

Solving

Postprocessing

MeshUp (since 2014)



■ CAD Interface

- Update and check of new CAD-versions with meshed parts

■ Meshing Process

- Support of meshing process
- Provision of data
- Flexible adaptable process
- Integration of ANSA-DM

■ Data Management

- Synchronization of work flow for all participants (internal and external)
- Role and right management

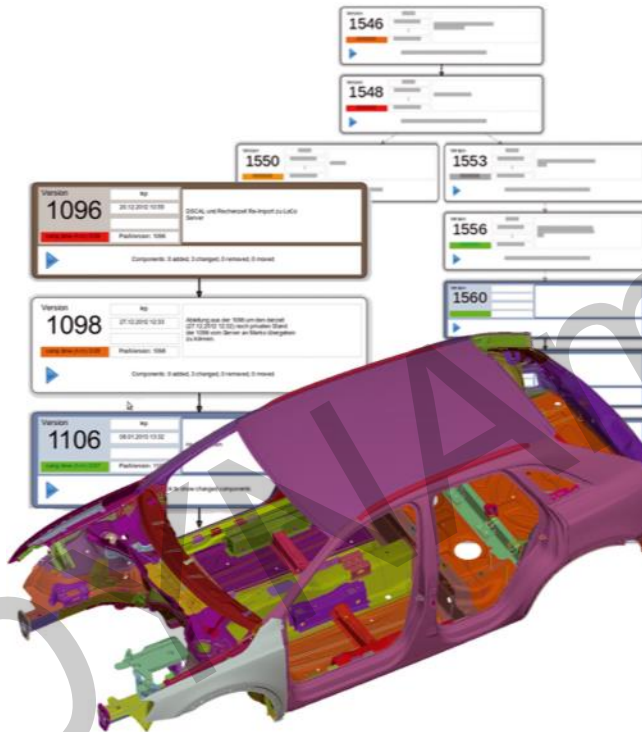
CAD/Meshing

PreProcessing

Solving

Postprocessing

LoCo (since 2006)



■ Simulation Data- / Variant Management

- Workbench for Simulation Engineers
- Unique RichClient/Offline-concept with sync-mechanism (internal/external)

■ Workflows / Features

- Integration of many CAE processes
- Solver: PAM-Crash, LS-DYNA, Nastran, Abaqus
- Job submit, optimization, robustness, ...
- Quality checks of models
- Security: Strong authentication, encoding
- Distributed, collaborative work environment
-

CAD/Meshing

PreProcessing

Solving

Postprocessing

CAViT (since 2009)

The screenshot displays the CAViT software interface. On the left, there is a 'Projekt' (Project) list with columns for 'Projekt', 'CBII', 'VV', 'CBII', and 'VV'. Below this is a 'Szenario' (Scenario) tree with a list of scenarios including Europa, NAR, Japan, China, Korea, Sensor, Sonstiges, and others. The main part of the interface is a 'Tabelle' (Table) with columns: 'Tag', 'Projekt', 'Testname', 'Direktive', 'Bearbeitungs-Status bzw. release level', and 'Head'. The table contains several rows of data, including 'Project 17 Test 184', 'Project 17 Test 192', 'Project 17 Test 199', and others. At the bottom, there is a 'Zeitstrahl' (Timeline) section with a date range from '28.11.2012' to '24.08.2014' and a 'Meilenstein 3' (Milestone 3) indicator.

Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw. release level	Head
	Project 17	Test 184	FMVSS208	CARRIED_O	324.7
	Project 17	Test 192	FMVSS208	CARRIED_O	
	Project 17	Test 199	FMVSS208	CARRIED_O	587.7
	Project 17	Test 173	FMVSS208	CREATED	337.6
	Project 17	Test 175	FMVSS208	CREATED	
	Project 17	Test 176	FMVSS208	CREATED	479.0
	Project 17	Test 177	FMVSS208	CREATED	352.3
	Project 17	Test 178	FMVSS208	CREATED	420.7
	Project 17	Test 179	FMVSS208	CREATED	316.4
	Project 17	Test 180	FMVSS208	CREATED	
	Project 17	Test 182	FMVSS208	CREATED	
	Project 17	Test 183	FMVSS208	CREATED	494.7
	Project 17	Test 188	FMVSS208	CREATED	414.7
	Project 17	Test 191	FMVSS208	CREATED	

■ Post Data Management

- Procurement and provision of outcome data from simulation and experiment
- Comparison, visualization of simulation and experimental data

■ Features

- Assessment of simulation and experimental results (szenario based)
- PlugIn-Concept amongst other things for integration of any application (e.g. Animator, Falcon,..) and processes
- Report generation
- ...

CAD/Meshing

PreProcessing

Solving

Postprocessing

Status.E (since 2008)



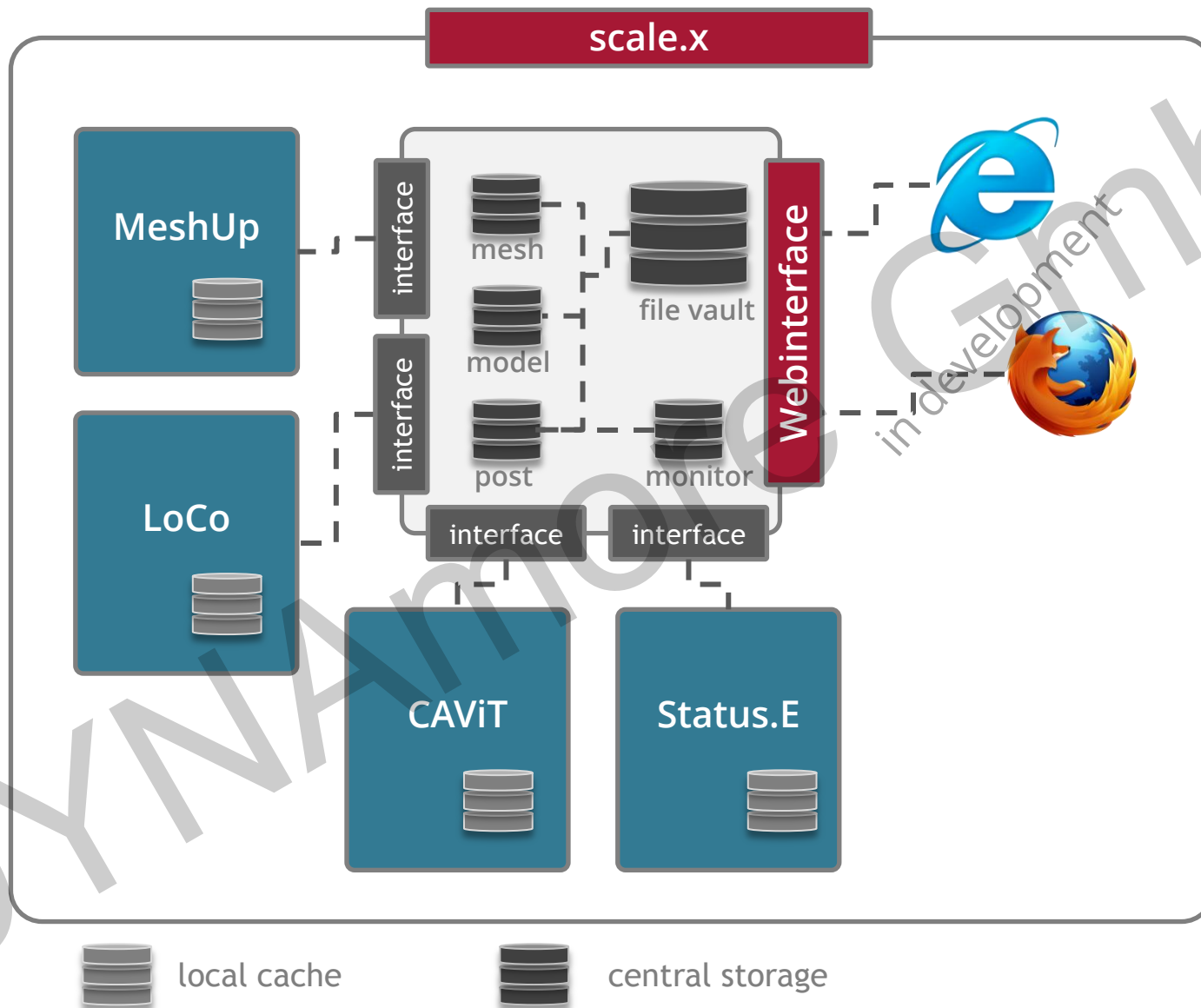
■ Status Monitoring

- Display of the performance of simulation and test requirements with respect to project milestones
- Aggregated review over CAE-disciplines and simulation departments

■ Documentation

- Integrated document management system
- Automatic generation of status reports (ppt, doc, pdf)

scale.x – Framework Architecture



Vielen Dank!

SCALE 

SCALE CAViT

The Evaluation and Reporting Environment

November 2014

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CAViT: *An Evaluation and Reporting Environment*

CAD/Meshing

PreProcessing

Solving

Postprocessing

CAViT (since 2009)

The screenshot displays the CAViT software interface. On the left, there is a 'Projekt' (Project) list with columns for 'Projekt', 'CBII', 'VV', 'CBII', and 'VV'. Below this is a 'Szenario' (Scenario) tree with a list of scenarios including Europa, NAR, Japan, China, Korea, Sensor, and Sonstiges. At the bottom left, there is a 'Darstellung' (Representation) section with a 'Zeitstrahl' (Timeline) and a 'Tabelle' (Table) view. The main part of the interface is a large table with columns: 'Tag', 'Projekt', 'Testname', 'Direktive', 'Bearbeitungs-Status bzw. release level', and 'Head'. The table contains several rows of data, including 'Project 17 Test 184', 'Project 17 Test 192', 'Project 17 Test 199', 'Project 17 Test 173', 'Project 17 Test 175', 'Project 17 Test 176', 'Project 17 Test 177', 'Project 17 Test 178', 'Project 17 Test 179', 'Project 17 Test 180', 'Project 17 Test 182', 'Project 17 Test 183', 'Project 17 Test 188', and 'Project 17 Test 191'. The table also shows a 'Zeitstrahl' (Timeline) at the bottom with a 'Meilenstein 3' (Milestone 3) and a 'Meilenstein 4' (Milestone 4).

■ Post Data Management

- Procurement and provision of outcome data from simulation and experiment
- Comparison, visualization of simulation and experimental data

■ Features

- Assessment of simulation and experimental results (szenario based)
- PlugIn-Concept amongst other things for integration of any application (e.g. Animator, Falcon,...) and processes
- Report generation
- ...

CAViT: *Key Features*



Integration

of CAT and CAE joined view on both data sets



Customization

views, rating scheme, categorization can be adopted in any almost any detail



Assisted Assessment of Tests and Simulation

scenario based rating of individual key results and rating recommendation of the test / simulation



Scripting Interface & Reporting

integration of third party tools, generation of reports or processes automation of any kind

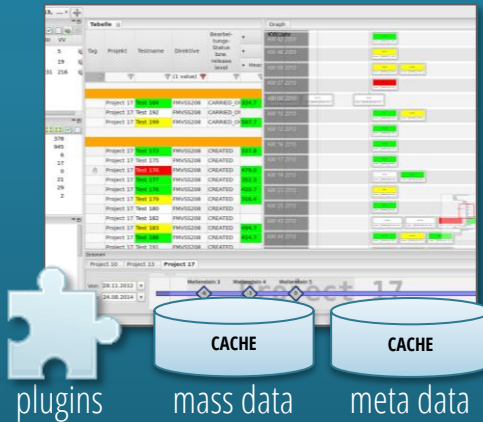


Versioning & Offline Work

user generated data are assigned to a particular point in time, can be tracked, held for archiving purposes and are available offline

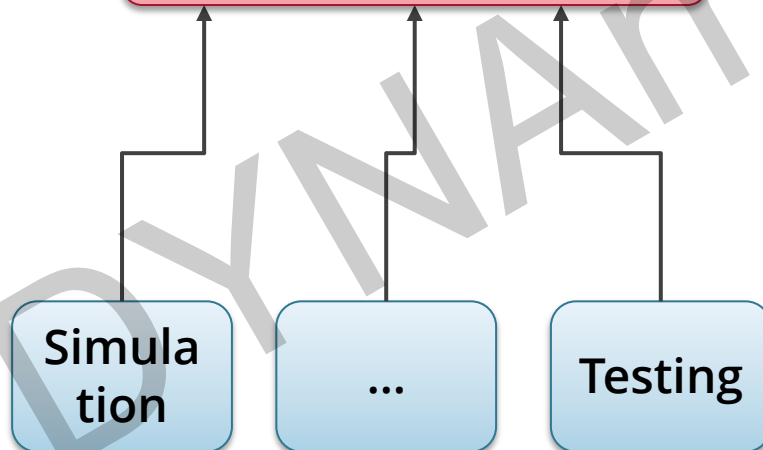
CAViT: Architecture

CAViT
RichClient



- rich client architecture
- locale caching (Performance)
- offline capabilities
- extendable via plugins
- seamless integration of 3rd party software
- runs on Linux and Windows

Back End Systems Interfaces



IT-Integration

- Data aggregation from back end systems via Interfaces
- Realizes ISO-MME data standard and supports ASAM ODS data types

CAViT: GUI Overview

The screenshot displays the CAViT GUI with several panels and data tables. The top-left panel shows a list of projects with checkboxes and numerical values. The bottom-left panel shows a scenario tree with checkboxes. The top-right panel shows a table of projects with columns for Tag, Projekt, Testname, and Direktive. The bottom-right panel shows a graph of projects over time, with a timeline at the bottom.

Projects
displayed projects and contextual actions

Selection / Filter
scenario based selection of tests and simulations

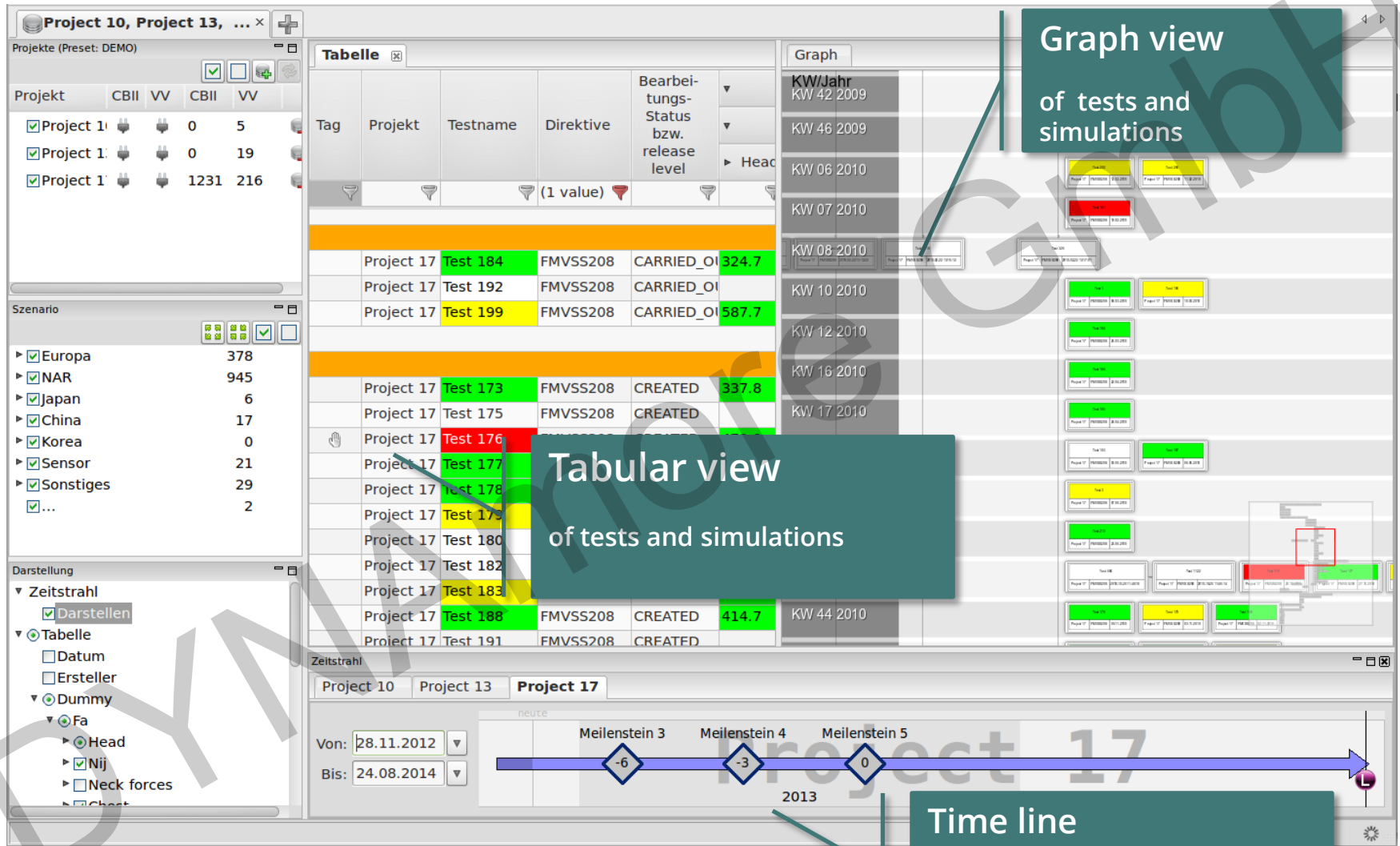
View settings
settings of table, graph and time line

Tag	Projekt	Testname	Direktive	Bearbeitungs-Status
Project 17	Test 199	FMVSS208	CARRIED_OI	587.7
Project 17	Test 173	FMVSS208	CREATED	337.8
Project 17	Test 182	FMVSS208	CREATED	
Project 17	Test 183	FMVSS208	CREATED	494.7
Project 17	Test 188	FMVSS208	CREATED	414.7

KW/Jahr	Test
KW 42 2009	Test 199
KW 46 2009	Test 199
KW 06 2010	Test 199
KW 07 2010	Test 199
KW 08 2010	Test 199
KW 10 2010	Test 199
KW 12 2010	Test 199
KW 16 2010	Test 199
KW 17 2010	Test 199
KW 18 2010	Test 199
KW 23 2010	Test 199
KW 25 2010	Test 199
KW 43 2010	Test 199
KW 44 2010	Test 199

Umgebung: Unknown Offline Modus

CAViT: GUI Overview



CAViT: Tabular view

Tabelle													
Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw. release level	Dummy								
					Fa				Bf				
					Head	Nij	Chest	Femur forces	Head	Nij	Neck forces	Chest	Femur f
			(1 value)										
Project 17	Test 169	FMVSS208	RESULTS_LIS	341.3									
Project 17	Test 170	FMVSS208	RESULTS_LIS	265.5									
Project 17	Test 181	FMVSS208	RESULTS_LIS	488.0									
Project 17	Test 185	FMVSS208	RESULTS_LIS	368.3									
Project 17	Test 186	FMVSS208	RESULTS_LIS	376.8									
Project 17	Test 187	FMVSS208	RESULTS_LIS	461.0									
Project 17	Test 190	FMVSS208	RESULTS_LIS	414.9									
Project 17	Test 195	FMVSS208	RESULTS_LIS	421.8									
Project 17	Test 196	FMVSS208	RESULTS_LIS	357.9									
Project 17	Test 197	FMVSS208	RESULTS_LIS	275.2									
Project 17	Test 200	FMVSS208	RESULTS_LIS	581.2									
Project 17	Test 202	FMVSS208	RESULTS_LIS										
Project 17	Test 206	FMVSS208	RESULTS_LIS	407.1									
Project 17	Test 208	FMVSS208	RESULTS_LIS	333.9									
Project 17	Test 213	FMVSS208	RESULTS_LIS	388.0									
Project 17	Test 0	FMVSS208	SCHEDULED	318.1	0.657	177.2	-842.122	243.1	0.201	342.251	177.2	-1023.332	
Project 17	Test 168	FMVSS208	SCHEDULED	191.8	0.216	199.4	-3410.745	274.7	0.313	1095.316	212.1	-2788.526	
Project 17	Test 171	FMVSS208	SCHEDULED	344.4	0.853	415.5	-3296.156	453.1	0.221	667.155	420.6	-1767.151	
Project 17	Test 172	FMVSS208	SCHEDULED										

Filter

Filter für Direktive

☐ Enthält Zeichenkette:

☐ Erfüllt Bedingung:

Werteliste für Direktive

☐ EuroNCAP
☐ FMVSS 208
☐ FMVSS 301
☒ FMVSS208
☐ IIHS
☐ LKW-Unterfahrt
☐ Sensor

☒ Ausgewählte Werte:

Abbrechen

OK

rows: tests & simulations

columns / subcolumns: test data / key results

rows: tests & simulations

columns / subcolumns: test data / key results

CAViT: Tabular view

Tabelle													
Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw. release level	Dummy								
					Fa				Bf				
					Head	Nij	Chest	Femur forces	Head	Nij	Neck forces	Chest	Femur f
			(1 value)										
Project 17	Test 169	FMVSS208	RESULTS_LIS	341.3	0.358	225.9	-136.398	159.5	0.088	368.672	132.0	-146.225	
Project 17	Test 170	FMVSS208	RESULTS_LIS	265.5	0.259	199.6	-3663.381	298.4	0.209				
Project 17	Test 181	FMV			0.374	418.8	-1570.725	401.3	0.511				
Project 17	Test 185	FMV			0.404	385.7	-5123.01	395.5	0.478				
Project 17	Test 186	FMV			0.965	383.3	-3676.409	448.3	0.292				
Project 17	Test 187	FMV			0.336	414.8	-2070.42	519.7	0.254				
Project 17	Test 190	FMVSS208	RESULTS_LIS	414.9	0.313	401.7	-2057.361	409.2	0.233				
Project 17	Test 195	FMVSS208	RESULTS_LIS	421.8	0.387	452.0	-2920.323	521.9	0.197				
Project 17	Test 196	FMVSS208	RESULTS_LIS	357.9	0.594	352.3	-3852.632	471.2	0.315				
Project 17	Test 197	FMV			0.527	349.9	-3654.675	417.0	0.424				
Project 17	Test 200	FMV			0.413	497.8	-2875.21	720.7	0.362				
Project 17	Test 202	FMV											
Project 17	Test 206	FMV			0.544	450.1	-6005.892	394.5	0.263				
Project 17	Test 208	FMV			0.299	373.4	-1701.184	379.9	0.199				
Project 17	Test 213	FMVSS208	RESULTS_LIS	388.0	0.338	380.0	-1898.346	440.2	0.21				
Project 17	Test 0	FMVSS208	SCHEDULED	318.1	0.657	177.2	-842.122	243.1	0.201				
Project 17	Test 168	FMVSS208	SCHEDULED	191.8	0.216	199.4	-3410.745	274.7	0.313				
Project 17	Test 171	FMVSS208	SCHEDULED	344.4	0.853	415.5	-3296.156	453.1	0.221				
Project 17	Test 172	FMVSS208	SCHEDULED	651.7	0.303	454.3	-3201.094	497.9	0.246				

manual
rating

suggested
rating
(aggregated)

automated
rating
of key results
of tests and
simulations
based on defined
scenarios

CAViT: Tabular view

Tabelle							
Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw.	Fa		
					Head	Nij	Chest
							Femur forces
	Project 17	Test 181	FMVSS208	RESULTS_LIS	488.0	0.374	118.8
	Project 17	Test 185	FMVSS208	RESULTS_LIS	368.3	0.404	185.7
	Project 17	Test 186	FMVSS208	RESULTS_LIS	376.8	0.965	183.3
	Project 17	Test 187	FMVSS208	RESULTS_LIS	461.0	0.336	114.8
	Project 17	Test 190	FMVSS208	RESULTS_LIS	414.9	0.313	101.7
	Project 17	Test 195	FMVSS208	RESULTS_LIS	421.8	0.387	152.0
	Project 17	Test 196	FMVSS208	RESULTS_LIS	357.9	0.594	152.3
	Project 17	Test 197	FMVSS208	RESULTS_LIS	275.2	0.527	349.9
	Project 17	Test 200	FMVSS208	RESULTS_LIS	581.2	0.413	497.8
	Project 17	Test 202	FMVSS208	RESULTS_LIS			
	Project 17	Test 206	FMVSS208	RESULTS_LIS	407.1	0.544	450.1
	Project 17	Test 208	FMVSS208	RESULTS_LIS	333.9	0.299	373.4
	Project 17	Test 213	FMVSS208	RESULTS_LIS	388.0	0.338	380.0
	Project 17	Test 0	FMVSS208	SCHEDULED	318.1	0.657	177.2
	Project 17	Test 168	FMVSS208	SCHEDULED	191.8	0.216	199.4
	Project 17	Test 171	FMVSS208	SCHEDULED	344.4	0.853	415.5
	Project 17	Test 172	FMVSS208	SCHEDULED	651.7	0.303	454.3

value and rating aggregation

expanded view

Nij			
Nij CE	Nij CF	Nij TE	Nij TF
0.065	0.001	0.358	0.191
0.033	0.066	0.208	0.259
0.296	0.008	0.359	0.374
0.028	0.083	0.404	0.313
0.818	0.131	0.965	0.129
0.085	0.074	0.149	0.336
0.062	0.003	0.213	0.313
0.005	0.081	0.238	0.387
0.252	0.110	0.594	0.133
0.000	0.130	0.527	0.133

CAViT: Tabular view

Tabelle					Dummy	
Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw. release level	Fa	Bf
			(1 value)			
	Project 17	Test 169	FMVSS208	RESUL		132.0 -146.225
	Project 17	Test 170	FMVSS208	RESUL		295.0 -3137.337
	Project 17	Test 181	FMVSS208	RESUL		363.0 -1221.459
	Project 17	Test 185	FMVSS208	RESUL		329.3 -3406.665
	Project 17	Test 186	FMVSS208	RESUL		461.6 -4588.675
	Project 17	Test 187	FMVSS208	RESUL		418.4 -2456.158
	Project 17	Test 190	FMVSS208	RESUL		348.6 -2101.654
	Project 17	Test 195	FMVSS208	RESUL		403.1 -2212.525
	Project 17	Test 196	FMVSS208	RESUL		523.2 -5675.077
	Project 17	Test 197	FMVSS208	RESUL		329.3 -3395.39
	Project 17	Test 200	FMVSS208	RESUL		570.5 -3030.944
	Project 17	Test 202	FMVSS208	RESUL		
	Project 17	Test 206	FMVSS208	RESUL		495.0 -5791.279
	Project 17	Test 208	FMVSS208	RESUL		353.3 -1666.115
	Project 17	Test 213	FMVSS208	RESUL		356.8 -1834.536
	Project 17	Test 0	FMVSS208	SCHED		177.2 -1023.332
	Project 17	Test 168	FMVSS208	SCHED		212.1 -2788.526
	Project 17	Test 171	FMVSS208	SCHED		420.6 -1767.151
	Project 17	Test 172	FMVSS208	SCHED		412.5 -2399.386

manual rating
of tests and simulations

Farbbewertung (Weiß setzt zurück)



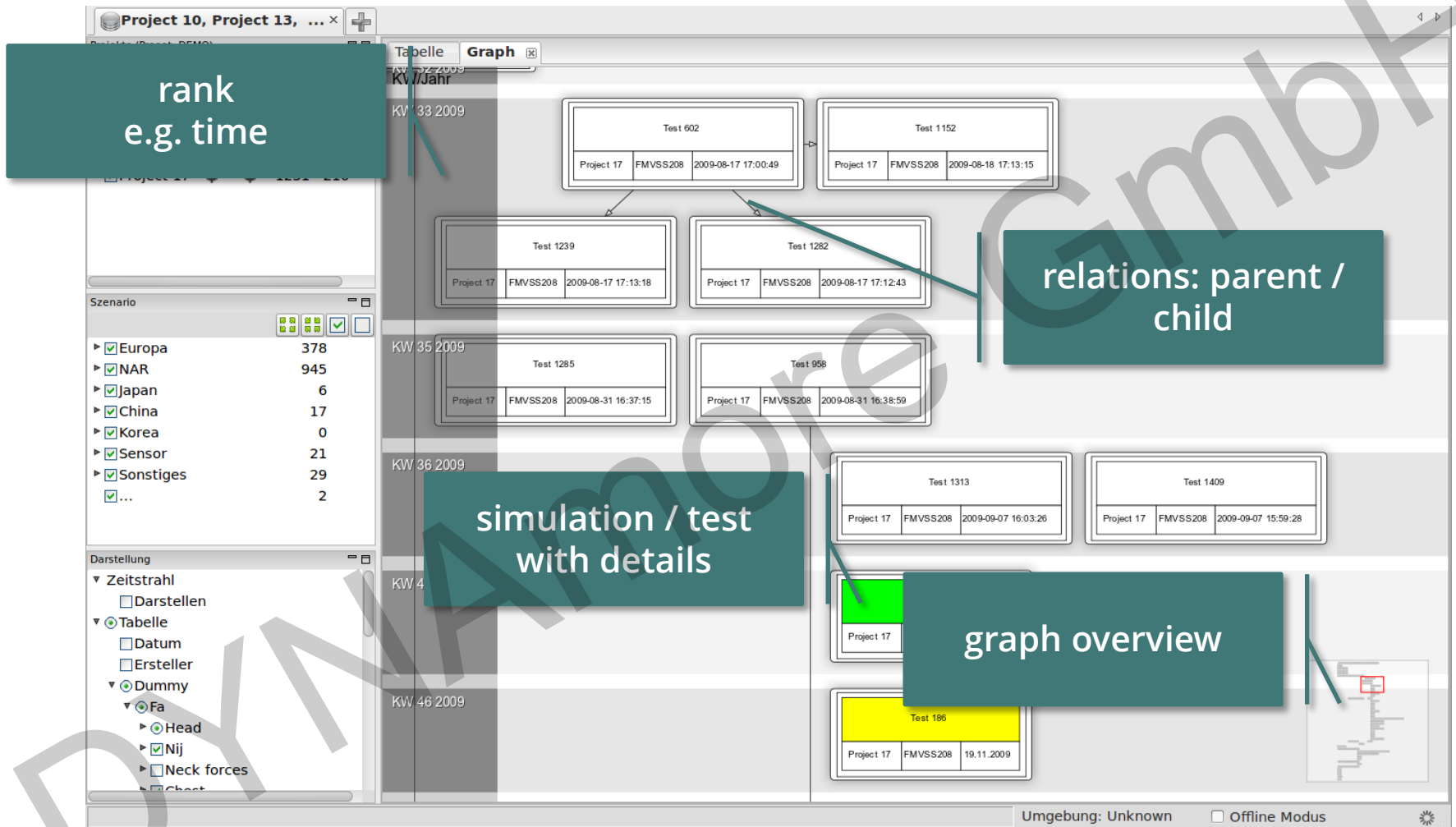
Kommentar

Bewertung manuell grün, da rote Bewertung aus dem Fehler eines Messaufnehmers [11CHSTHFHMCXC] resultiert

Abbrechen

OK

CAViT: Graph view



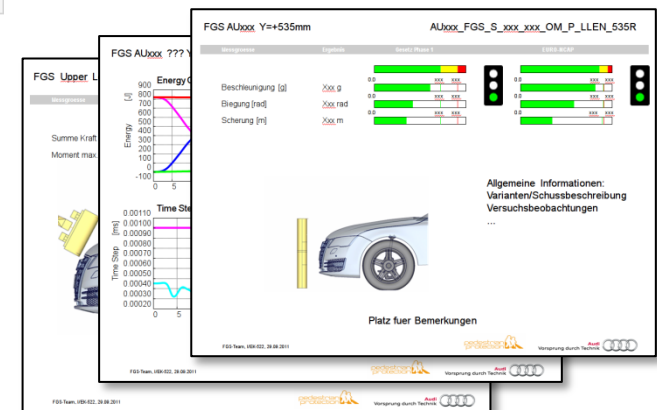
CAViT: Scripting Interface

Tabelle							
Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw. release level	Fa		
			(1 value)		Head	Nij	Ches
	Project 17	Test 169	FMVSS208	RESULTS_LIS	341.3	0.358	225.9
	Project 17	Test 170	FMVSS208	RESULTS_LIS	265.5	0.259	199.6
	Project 17	Test 181	FMVSS208	RESULTS_LIS	488.0	0.374	418.8
	Project 17	Test 185	FMVSS208	RESULTS_LIS	368.3	0.404	385.7
	Project 17	Werkzeuge...			Metadaten anzeigen...		
	Project 17	Kennzeichnen als...					
	Project 17	Bewerten...			Front Report (ver 0.8.13, global)		
	Project 17	Dokumentenablage					
	Project 17	zur Arbeitsmappe...			Werkzeuge neu laden		
		Suchen					

[visual compare in viewer]



[PDF/PPTs reports]



- integration of post processors, third party tools
- report generation
- plugin concept for scripts; python (interpreter is built in) or any other script language may be used

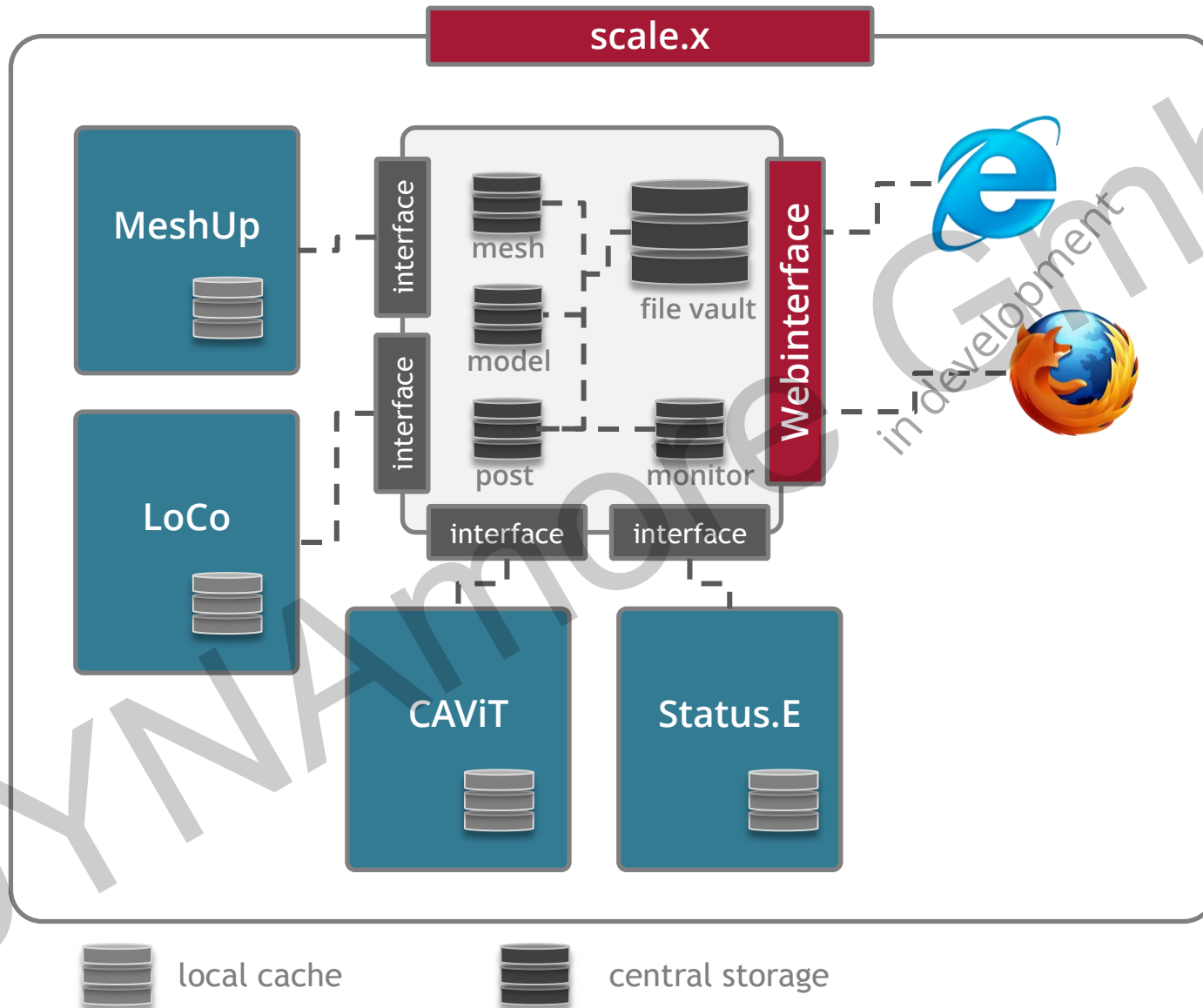
CAViT: Data interchange with scale.monitor

- Selected tests / simulations can be tagged as relevant for the project status and exported to Status.E with all their properties

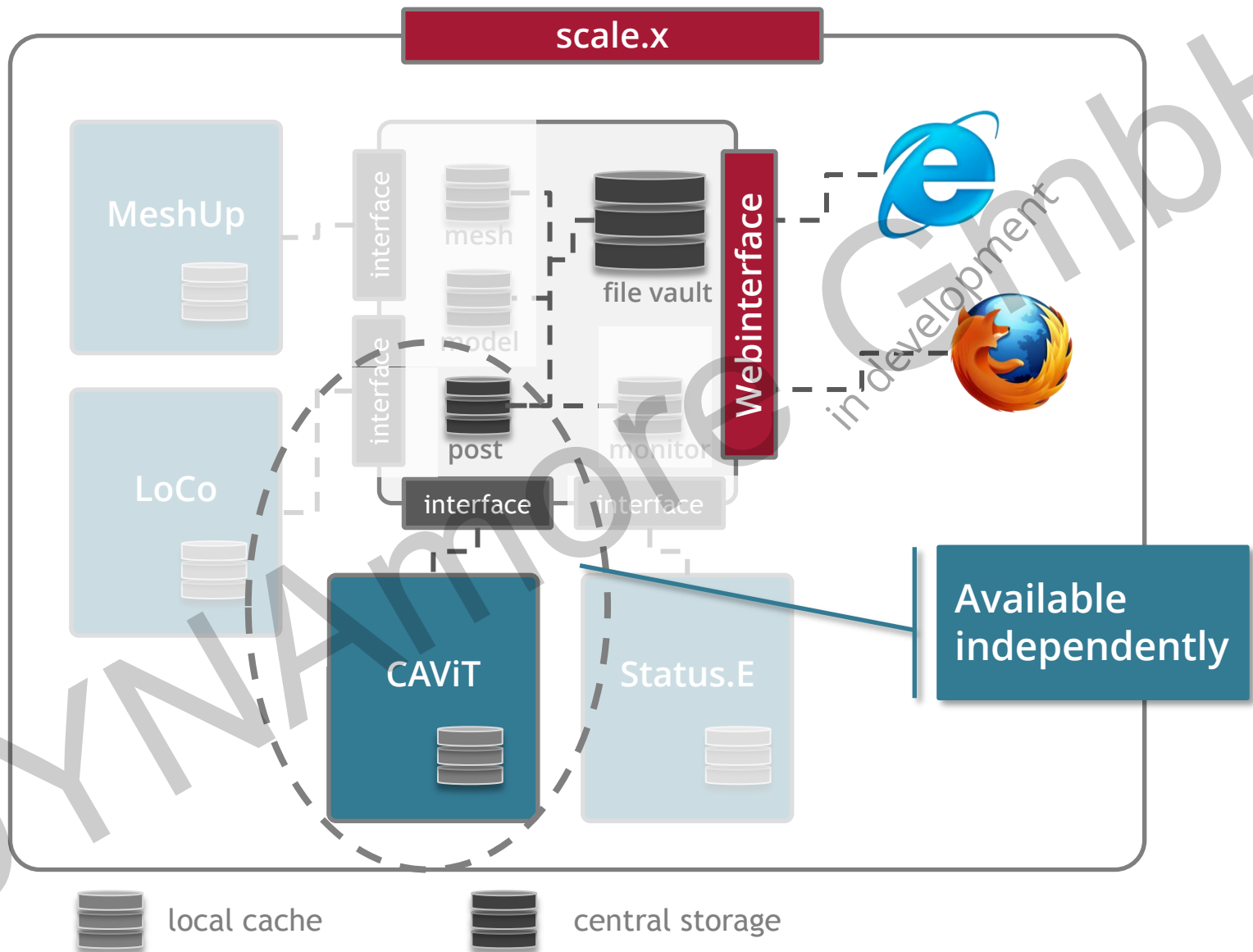
Tabelle							
Tag	Projekt	Testname	Direktive	Bearbeitungs-Status bzw. release level	Fa		
					Head	Nij	Ches
			(1 value)				
Hand	Project 17	Test 169	FMVSS208	RESULTS_LIS	341.3	0.358	225.9
	Project 17	Test 170	FMVSS208	RESULTS_LIS	265.5	0.259	199.6
Hand	Project 17	Test 181	FMVSS208	RESULTS_LIS	488.0	0.374	418.8
	Project 17	Test 185	FMVSS208	RESULTS_LIS	368.3	0.404	385.7
	Project 17	Test 186	FMVSS208	RESULTS_LIS	376.8	0.965	383.3
	Project 17	Test 187	FMVSS208	RESULTS_LIS	461.0	0.336	414.8
	Project 17	Test 190	FMVSS208	RESULTS_LIS	414.9	0.313	401.7
	Project 17	Test 195	FMVSS208	RESULTS_LIS	421.8	0.387	452.0
	Project 17	Test 196	FMVSS208	RESULTS_LIS	357.9	0.594	352.3

Status.E

scale.x – Framework Architecture



scale.x – Framework Architecture



Vielen Dank!

SCALE 

LoCo

Software Solution for Management of Simulation Models

October 2014

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LoCo: *Product of SCALE for Data and Process Management*

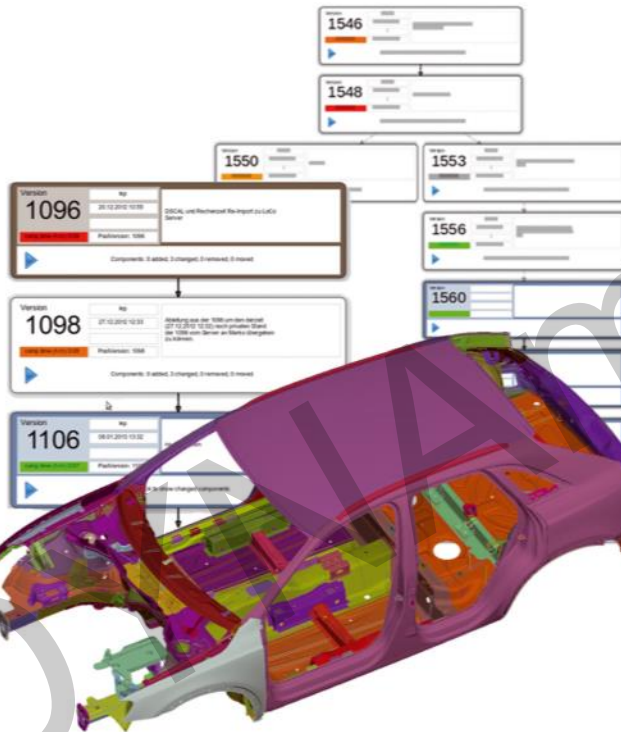
CAD/Meshing

PreProcessing

Solving

Postprocessing

LoCo (since 2006)



■ Simulation data and process management

- Workbench for Simulation Engineers
- Unique RichClient/Offline concept with sync-technology (internal and external)

■ Workflows / Features

- Integration of many specific CAE processes
- Solver: PAM-Crash, LS-DYNA, Nastran, Abaqus
- Quality check of models
- Strong authentication, encryption
- Distributed, collaborative working environment
- Sophisticated variant management
- Documentation, development history
- Optimization, DOE and robustness studies ...
- ...

LoCo: *Product of SCALE for Data and Process Management*

Software System for Management of Simulation Input Data

■ Target Group

- CAE-engineers
- Leader of simulation projects

■ Motivation

- Synergy
- Transparency
- Consistency
- Time Savings
- Homogeneity

Sharing of common parts

Integrated documentation

Synchronization with all project members

Automation of processes

Unification of simulation data and enforcement of standards



LoCo: *Workbench for Simulation Engineers*

Display of Full Model & Sub-Models

- Defined, standardized outline of the overall model
- Shared availability of all sub-models
- Clear responsibilities (role management) for sub-models through access control
- Users have on demand access to the current model and sub-model state
- Usage similar to Windows file explorer

LoCo: *Workbench for Simulation Engineers*

Clarity

- Listing of all include files (sub-models)
- Thumbnails for quick overview

Integration

- Integration of any 3rd party product, e.g. ANSA, to access data

Intuitive

- Contextual actions

Image	Name	Short description	Attributes	Pool version	Short owner
	Tank	quattro Sattel		46	M. Thiele
	Tank	Tank Harnstoff		46	M. Thiele
	Fahrwerk	Alufelgen17		46	M. Thiele
	Fahrwerk	HiRa und Lenker		46	M. Thiele
	Fahrwerk	Alufelgen17		46	M. Thiele
	Fahrwerk	Differential		46	M. Thiele
	Fahrwerk	HiRa und Lenker		46	M. Thiele
	Lenkung	lenkgetriebe			M. Thiele
	Lenkung	lenksaeule			M. Thiele
	Lenkung	lenkteleskop			M. Thiele
	Pedalerie	pedalbock			M. Thiele
	CMS	ueberzug vo			M. Thiele
	CMS	Stossfaenger hinten		46	M. Thiele
	CMS	ueberzug hi NSM		46	M. Thiele
	Frontklappe	NSMAS inkl Schamiere		46	M. Thiele
	Heckklappe	NSMAS inkl Schamiere		46	M. Thiele

Contextual actions menu:

- Edit with...
- Replace...
- Delete
- Update Metadata
- Export to file
- Assign version...
- Tag this version
- Show in Editor...
- Set public
- Show History...
- View Model
- Show groups
- Show all components

Internal Text-Editor... gvim

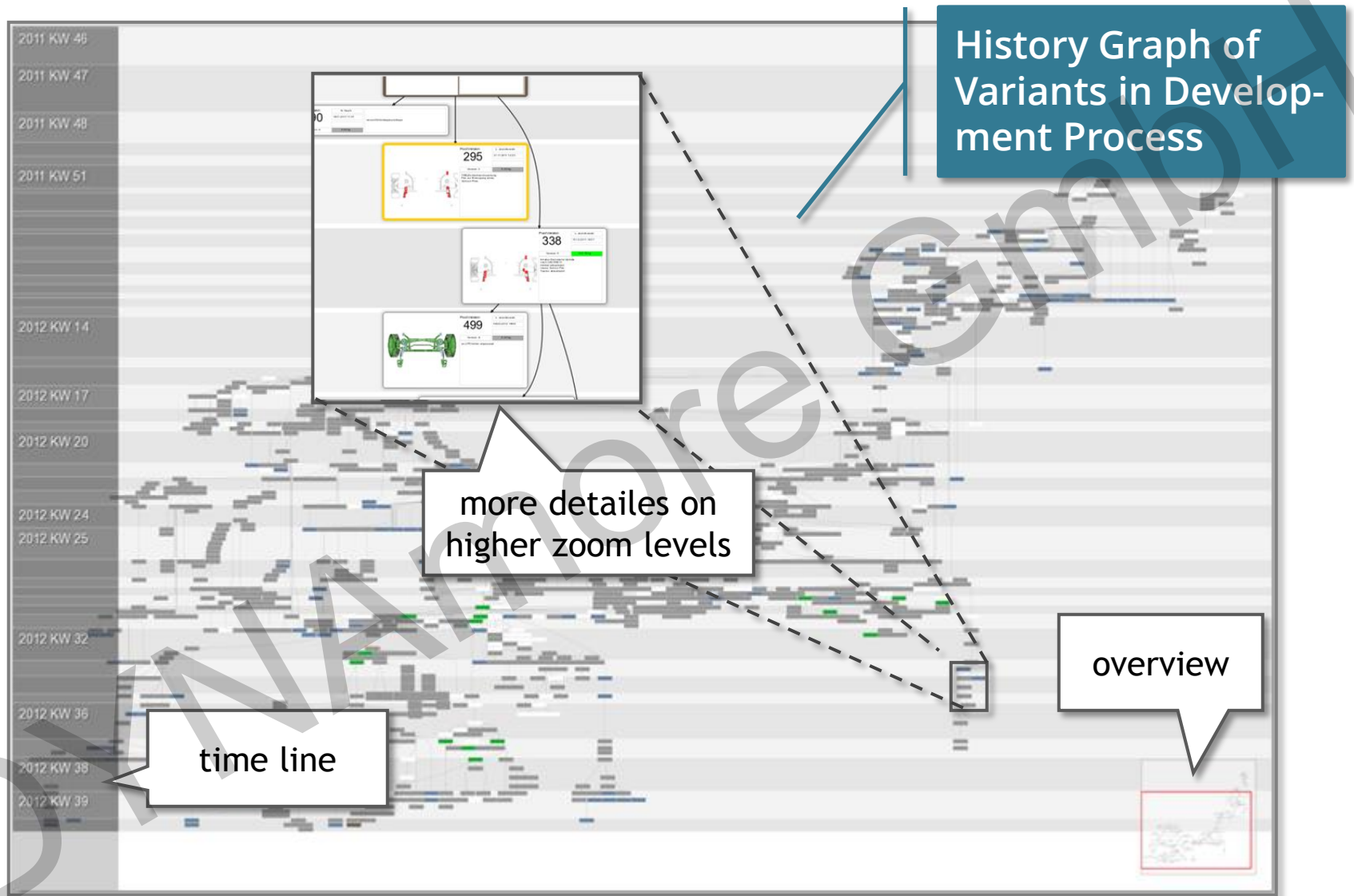
LoCo: *Workbench for Simulation Engineers*

The screenshot displays the LoCo2 software interface. On the left, a 'Browser' pane shows a hierarchical tree of simulation pools, with 'AU491' selected. The main area features a table with columns: 'Image', 'Name', 'Short description', 'Attributes', 'Pool version', and 'Short owner'. The table lists various components like 'Frontend', 'Kühler', 'Scheinwerfer', 'CMS', 'Tuer', 'Heck', 'Seite', 'Tuer', 'Frontscheibe', 'Karosserie', and 'Heckscheibe'. A blue callout box titled 'History Graph' highlights the following features:

- Visualization of variant order
- Tracking of target values
- Comments
- Thumbnails with visualization of changed parts
- Different zoom levels

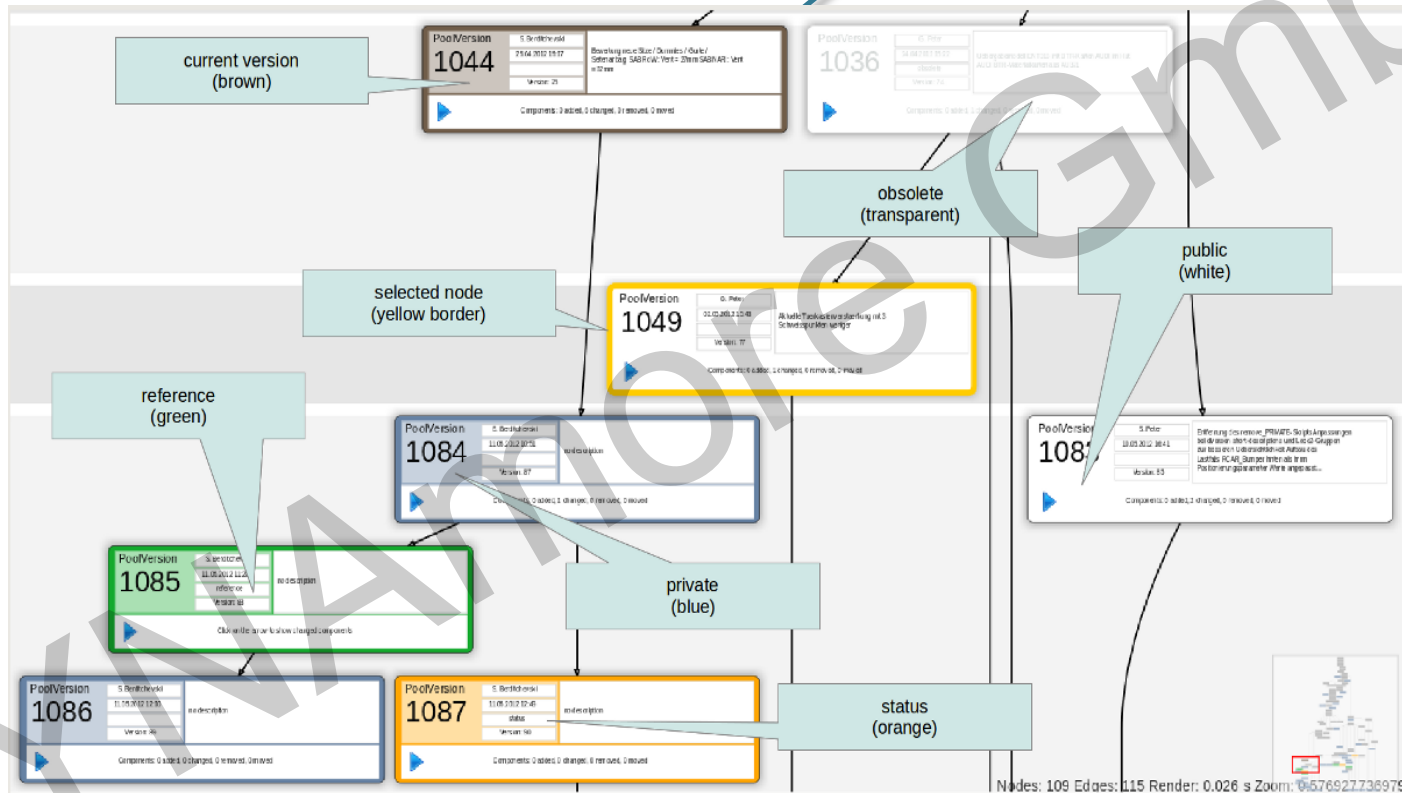
On the right, a 'History' pane shows a detailed view of the 'Initialer Import' pool. It displays a sequence of changes, each with a number, a thumbnail, a date, and a comment. The changes are: 1 (Initialer Import), 8 (Eine andere Änderung am Türschloss), 11 (Am Rahmen kann man Masse...), 9 (Und schon wieder am Türschloss...), 15 (Aber auch die Masse), and 10 (Und noch ein Test). The 'History' pane also includes tabs for 'Pool View', 'History', 'Model', and 'Properties'.

LoCo: *Workbench for Simulation Engineers*

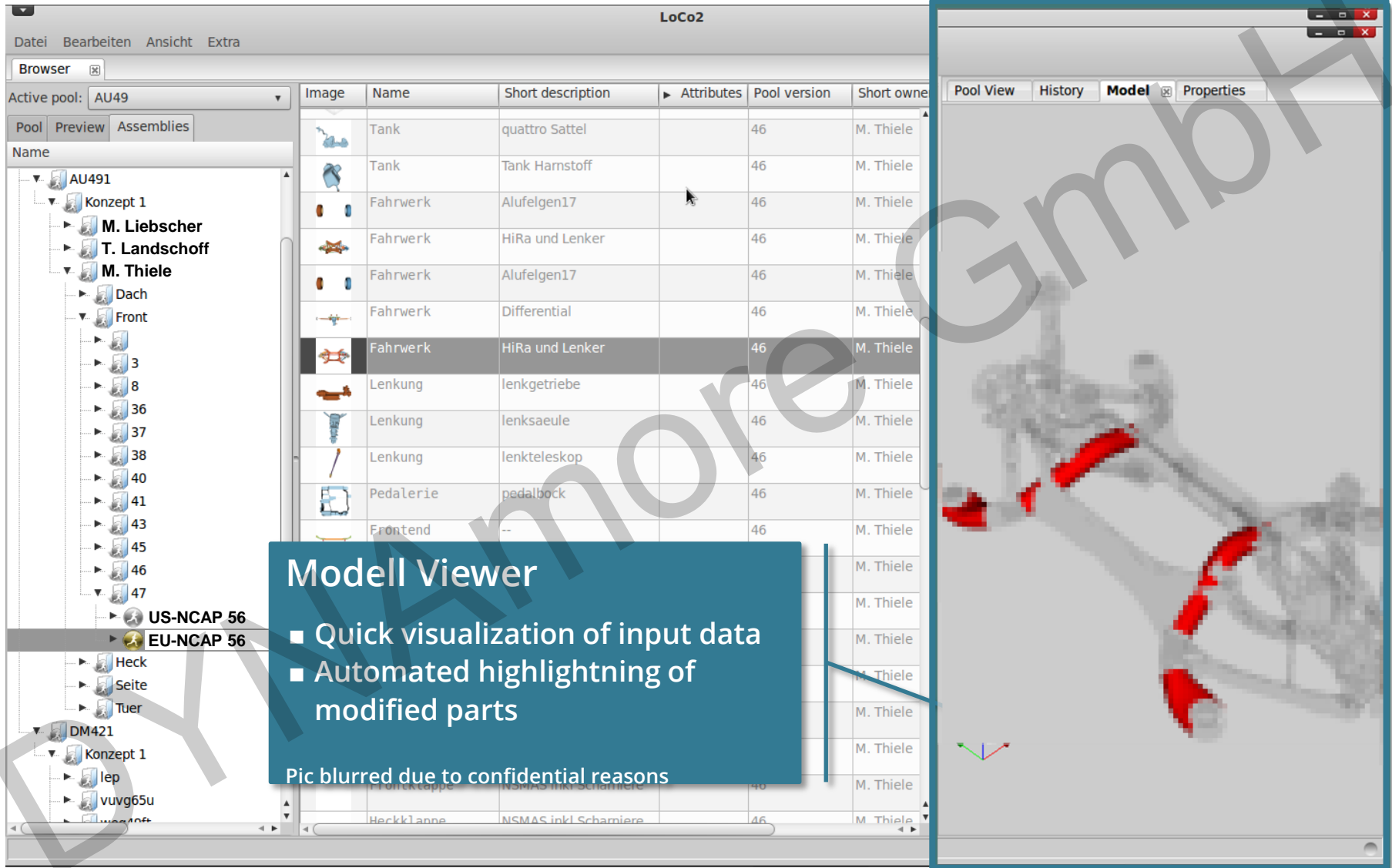


LoCo: *Workbench for Simulation Engineers*

History Graph – Meaning of Colors



LoCo: *Workbench for Simulation Engineers*



The screenshot displays the LoCo2 software interface. On the left, a 'Browser' pane shows a hierarchical tree of components under 'AU491', including 'Konzept 1', 'M. Liebscher', 'T. Landschoff', 'M. Thiele', 'Dach', 'Front', and various numbered parts. The main area features a table with columns: Image, Name, Short description, Attributes, Pool version, and Short owner. The table lists various components like 'Tank', 'Fahrwerk', 'Lenkung', and 'Pedalerie'. A blue callout box titled 'Modell Viewer' is overlaid on the table, containing a list of features and a note about confidentiality. On the right, a 'Model View' pane shows a 3D wireframe model of a vehicle chassis with red highlights on specific components.

Image	Name	Short description	Attributes	Pool version	Short owner
	Tank	quattro Sattel		46	M. Thiele
	Tank	Tank Hamstoff		46	M. Thiele
	Fahrwerk	Alufelgen17		46	M. Thiele
	Fahrwerk	HiRa und Lenker		46	M. Thiele
	Fahrwerk	Alufelgen17		46	M. Thiele
	Fahrwerk	Differential		46	M. Thiele
	Fahrwerk	HiRa und Lenker		46	M. Thiele
	Lenkung	lenkgetriebe		46	M. Thiele
	Lenkung	lenksaeule		46	M. Thiele
	Lenkung	lenkteleskop		46	M. Thiele
	Pedalerie	pedalbock		46	M. Thiele
	Frontend	--		46	M. Thiele

Modell Viewer

- Quick visualization of input data
- Automated highlighting of modified parts

Pic blurred due to confidential reasons

LoCo: *Workbench for Simulation Engineers*

The screenshot displays the LoCo2 software interface. On the left, a 'Browser' pane shows a tree structure of simulation pools, including 'AU491', 'Konzept 1', and various sub-pools like 'M. Liebscher', 'T. Landschoff', and 'M. Thiele'. The main area features a table with columns: Image, Name, Short description, Attributes, Pool version, and Short owner. The table lists various simulation components like 'Frontend', 'Kühler', 'Scheinwerfer', 'CMS', 'Tuer', 'Heck', 'Seite', 'Tuer', 'Frontscheibe', 'Karosserie', and 'Heckscheibe'. On the right, a 'Pool View' pane shows a 'History' tab with a list of simulation results. A blue box highlights the 'Include-Checks: Ergebnisse' section, which contains a checklist of quality management items.

Image	Name	Short description	Attributes	Pool version	Short owner
	Frontend	--		46	M. Thiele
	Kühler	--		46	M. Thiele
	Scheinwerfer	scheinwerfer vo NSM		46	M. Thiele
	CMS	Stossfaenger vorne		46	M. Thiele
	CMS	ueberzug vo NSM		46	M. Thiele
	CMS	Stossfaenger hinten		46	M. Thiele
	Tuer	Rohbau inkl Schloss		46	M. Thiele
	Tuer	Tuerscheibe oben		46	M. Thiele
	Tuer	Rohbau inkl Schloss		46	M. Thiele
	Tuer	Tuerscheibe oben		46	M. Thiele
	Frontscheibe	--		46	M. Thiele
	Karosserie	EU Verst Saeule B		46	M. Thiele
	Karosserie	Heckscheibe		46	M. Thiele

Quality Management

- Check at each import
- User defined checks configurable
- Sanctionable on the basis of a quality index

Include-Checks: Ergebnisse

- ✗ Elementqualitaet
 - ✗ SHE:Quads < Minimum ANGLE [PAM-CRASH]
 - ✗ SHE:SKEW [NASTRAN]
 - ✗ SHE:Total Shell Elements OFF
 - zu viele schlechte Elemente: 16.342
 - ✓ SHE:Trias < Minimum ANGLE [PAM-CRASH]
 - ✓ SOL:Hexas > Maximum ANGLE [PAM-CRASH]
 - ✓ SOL:Pentas < Minimum ANGLE [PAM-CRASH]
 - ✗ SOL:Total Solids Elements OFF
 - zu viele schlechte Elemente: 100.000
 - ✓ SOL:WARP [PAM-CRASH]
- ✓ Nummerierungskonvention
 - ✓ CONTACT
 - ✓ ELEM
 - ✓ ELEM. BAR
 - ✓ ELEM. SHELL
 - ✓ ELEM. SOLID
 - ✓ ELEM. TETR4
 - ✓ FUNCTION
 - ✓ MATER
 - ✓ NODE
 - ✓ NODE_ELEM
 - ✓ PART
 - ✓ RIGID BODY
 - ✓ TIED
- 💡 Gruppen - Definiert/Referenziert

LoCo: *Workbench for Simulation Engineers*

LoCo2

Datei Bearbeiten Ansicht Extra

Browser

Active pool: AU49

Pool Preview Assemblies

Name

AU491

Konzept 1

M. Liebscher

T. Landschoff

M. Thiele

Dach

Front

3

8

36

37

38

40

41

43

45

46

47

US-NCAP 56

EU-NCAP 56

Heck

Seite

Tuer

DM421

Konzept 1

lep

vuv65u

vuv65u

Image Name Short description Attributes Pool version Short owner

Material ownmaterial 46 M. Thiele

Material K1 46 M. Thiele

V40 Barriere ODB v40 Defoelem 46 M. Thiele

Barriere ODB v40 Master 46 M. Thiele

Fahrbahn Boden FZG FC SC HC 46 M. Thiele

Fahrbahn Pos Frontcrash 17Zoll 46 M. Thiele

Abgas

Abgas

Getrie

Getrie

Getrie

Antrie

Photo

Batterie Batterie 46 M. Thiele

Package esp hydroaggregat 46 M. Thiele

Package package Wasserkasten 46 M. Thiele

Package 48V Batterie 46 M. Thiele

Package Elo EPB 46 M. Thiele

Package Elo Infotainment NSM 46 M. Thiele

Package notrad 18 zoll 46 M. Thiele

Bill of Materials

- Overview of all parts and their properties (mass, materials...)
- E.g. „on the fly“-modification of gauge thicknesses

Pool View History Properties

V40 **Barriere**

ODB v40 Defoelem

Component Images Comments Reports BOM

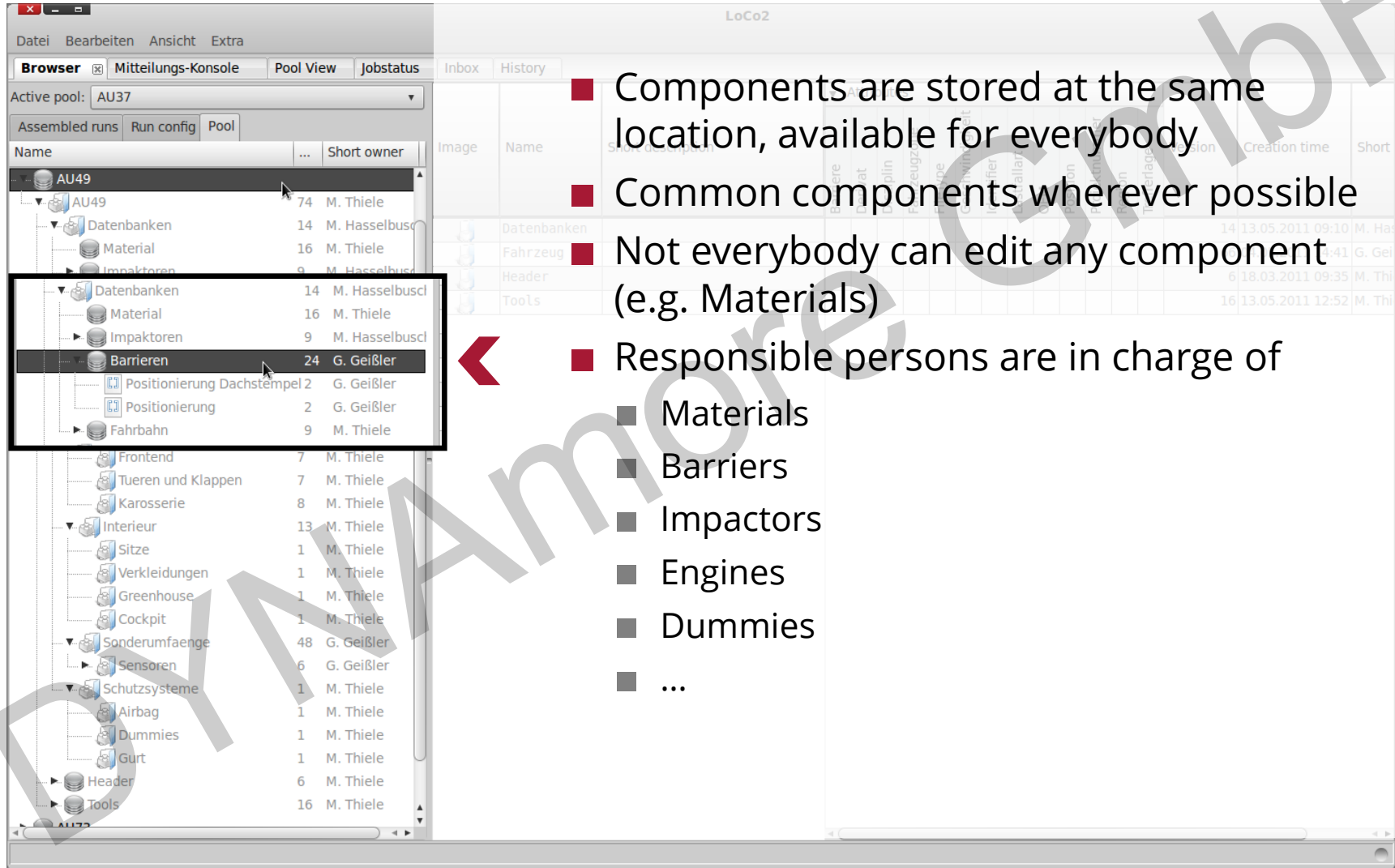
S	D	PID	PName	Thickr	TotalMas
✓		9807001	Deckplatte Stahl	...	20.00 125.600
✓		9807999	RIGIDWALL	1.00	68.688
✓	↑	9807002	Anschlussplatte Stahl	...	1.20 7.536
✓		9999000	Part Versionsnummer	1.00	3.915
✓		9808001	STAHL BAR Messbalken mit...	-	2.779
✓		9805001	DECKBLECH VORN	...	0.81 1.319
✓		9805002	DECKBLECH OBEN	...	0.81 1.040
✓		9805003	DECKBLECH UNTEN	...	0.81 1.040
✓		9806001	BUMPER-DECKBLECH	...	0.81 0.720
✓		9899003	TIED Part Klebekontakt Barr...	-	0.000
✓		9899002	TIED Part Klebekontakt Bu...	-	0.000
✓		9899001	TIED Part Klebekontakt Bu...	-	0.000
✗		9801001	BLOCK	...	- -
✗		9802001	BUMPER	...	- -

Number of parts: 14
Total: ?
Total (Selection): 1.3 kg (S: 1.319 kg / N: 0.000 kg), dM: +0.000 kg

Search apply BOM reset BOM

LoCo: *Modeling Aspects*

■ Uniform model structure for all departments



LoCo2

Browser | Mitteilungs-Konsole | Pool View | Jobstatus | Inbox | History

Active pool: AU37

Assembled runs | Run config | Pool

Name	...	Short owner
AU49		74 M. Thiele
AU49		
Datenbanken		14 M. Hasselbusch
Material		16 M. Thiele
Impaktoren		9 M. Hasselbusch
Datenbanken		14 M. Hasselbusch
Material		16 M. Thiele
Impaktoren		9 M. Hasselbusch
Barrieren		24 G. Geißler
Positionierung Dachstempel		2 G. Geißler
Positionierung		2 G. Geißler
Fahrbahn		9 M. Thiele
Frontend		7 M. Thiele
Türen und Klappen		7 M. Thiele
Karosserie		8 M. Thiele
Interieur		13 M. Thiele
Sitze		1 M. Thiele
Verkleidungen		1 M. Thiele
Greenhouse		1 M. Thiele
Cockpit		1 M. Thiele
Sonderumfaenge		48 G. Geißler
Sensoren		6 G. Geißler
Schutzsysteme		1 M. Thiele
Airbag		1 M. Thiele
Dummies		1 M. Thiele
Gurt		1 M. Thiele
Header		6 M. Thiele
Tools		16 M. Thiele

■ Components are stored at the same location, available for everybody

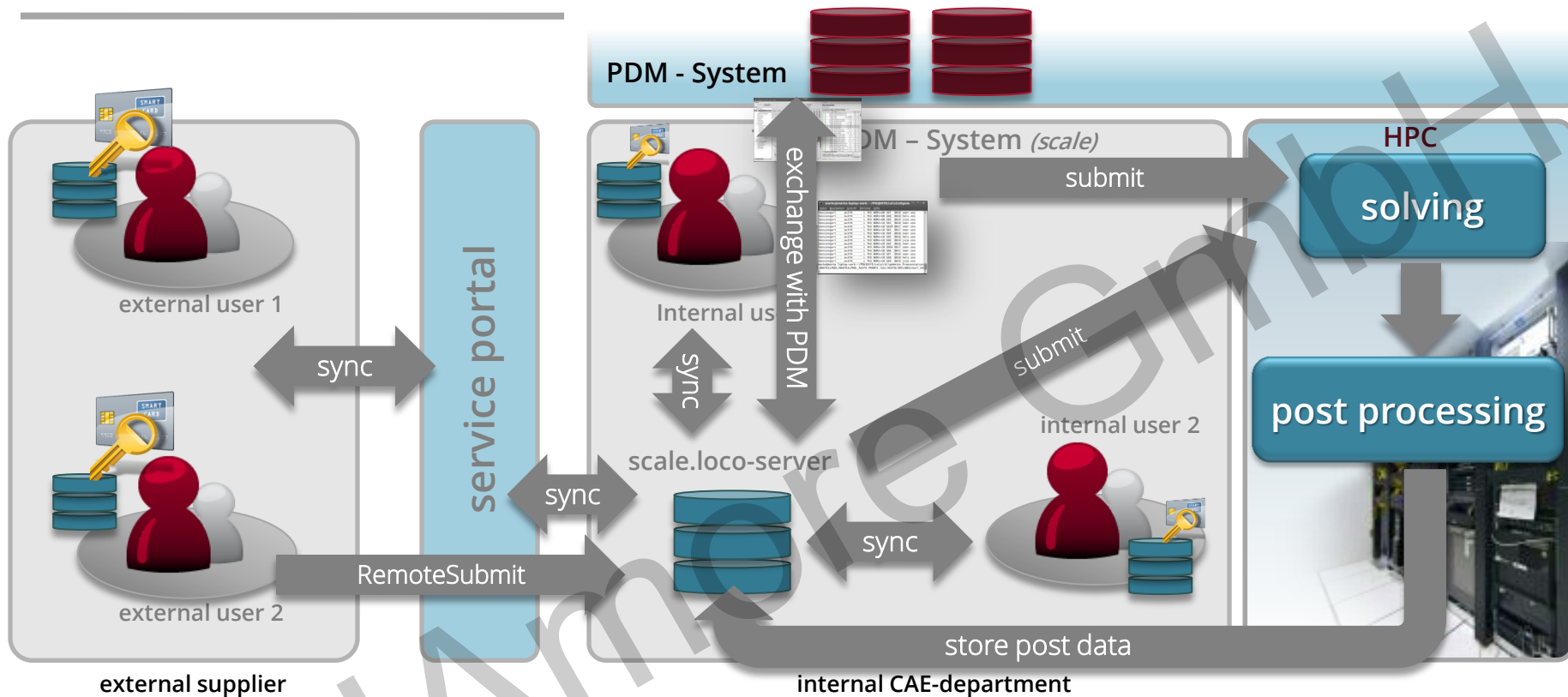
■ Common components wherever possible

■ Not everybody can edit any component (e.g. Materials)

■ Responsible persons are in charge of

- Materials
- Barriers
- Impactors
- Engines
- Dummies
- ...

LoCo: *Workflow, Teamwork and Synchronization*



Sync

decentralized

Offline / Online

performance

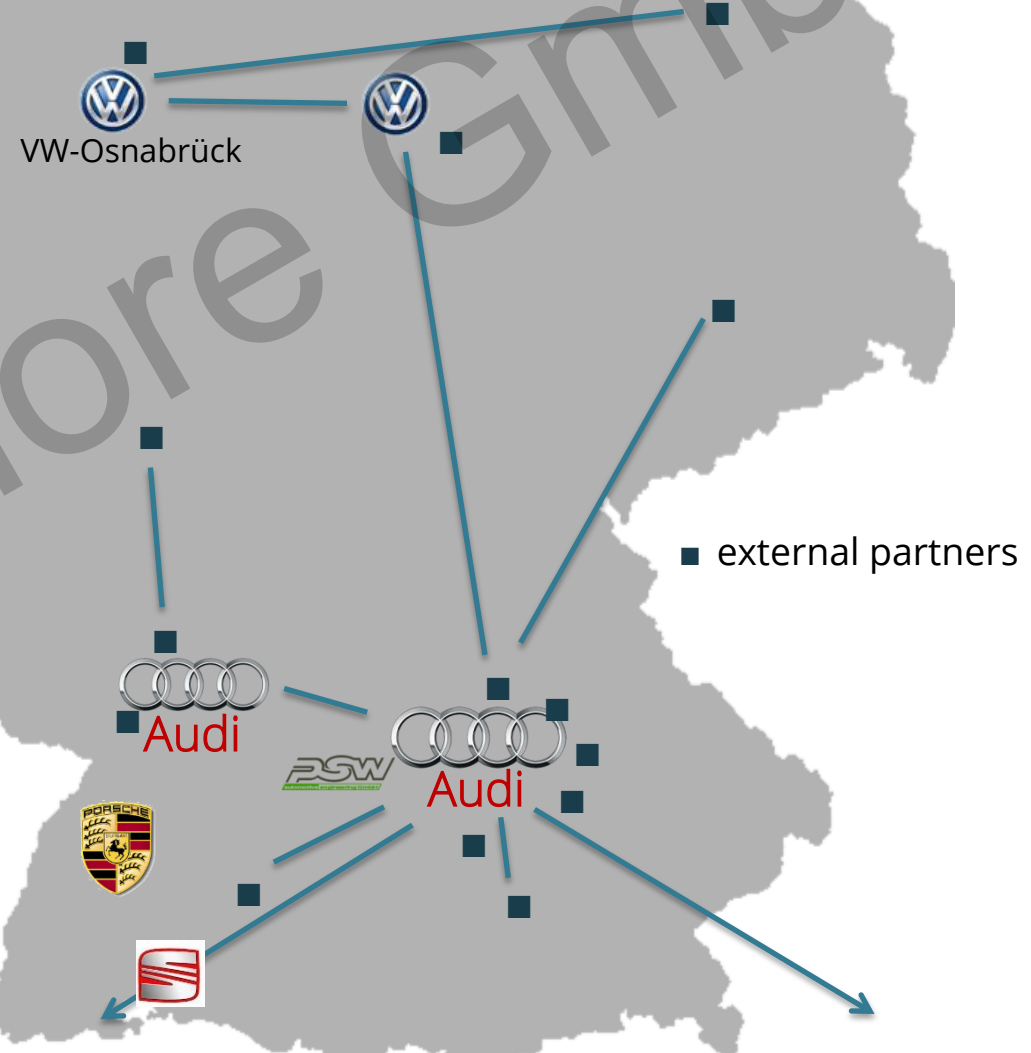
Integration

- Central data storage, synchronization with local workstations (*cloud like infrastructure*)
- Encrypted transfer, encrypted storage (*two factor authentication and encryption*)
- Offline handling of components (*RichClient*)
 - Users/Teams are independent of servers and infrastructure
 - Users work with local data
 - Good performance while application of preprocessing tools
- Integration with existing PDM Infrastructure as TDM-System (*Team Data Management*)

Example: *Decentralized Development with LoCo at VW-Group*

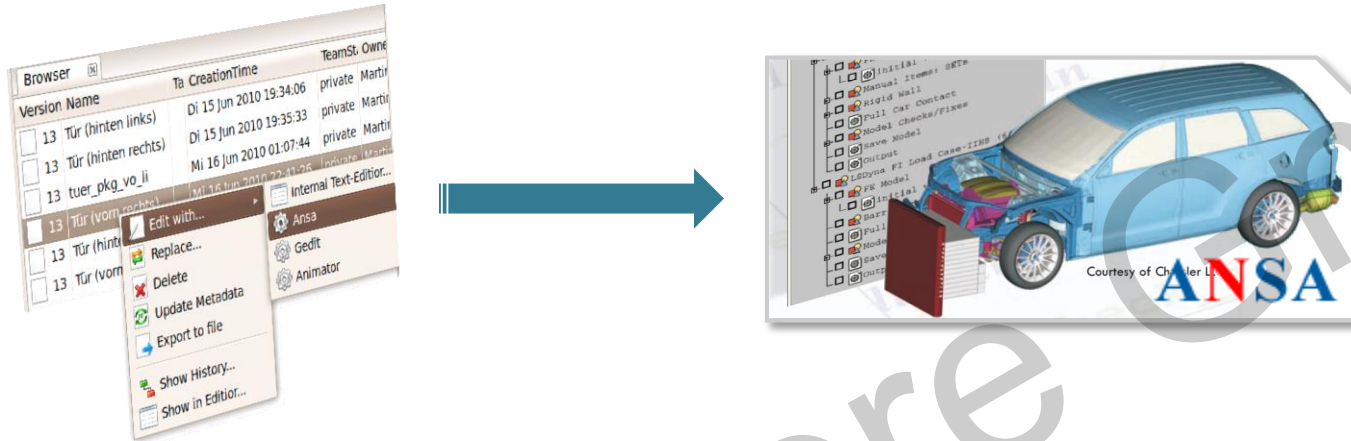
■ Suppliers and Service Partners

- Direct integration in CAE development process
- Uniform working environment
- Automatic synchronization of relevant data
- Good performance even for poor network bandwidth
- Complying with high security requirements
 - encrypted storage
 - encrypted transfer
 - two factor authentication and encryption

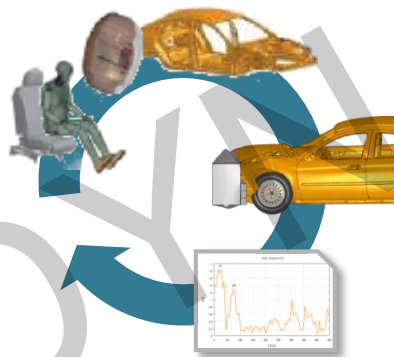


LoCo: *Open System / Integration of Software*

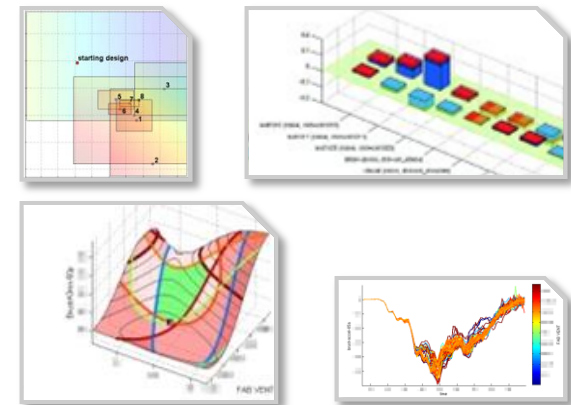
Direct application of external tools (*Ansa, Animator, nedit, vi, user scripts, etc...*)



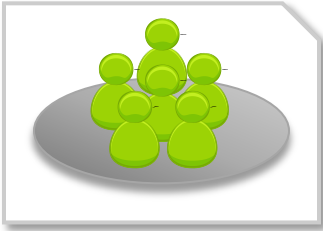
Integration of DOE Studies / Optimization



- Models are parameterized within the data management system
- Simulation models are assembled automatically
- Access to optimization software such as LS-OPT



LoCo: *Key Features - Summary*



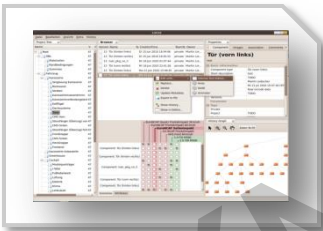
Customizable Rich Client

- Adaption to customer requirements
- Structured / standardized work flow
- Continuous documentation of components and sub-models



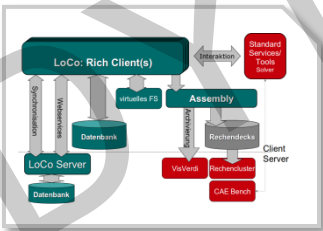
Modul Strategy for Simulation

- Simple cross-disciplinary reusability of components
- Rights and role management for exchange with suppliers or other teams



Intuitive Usage

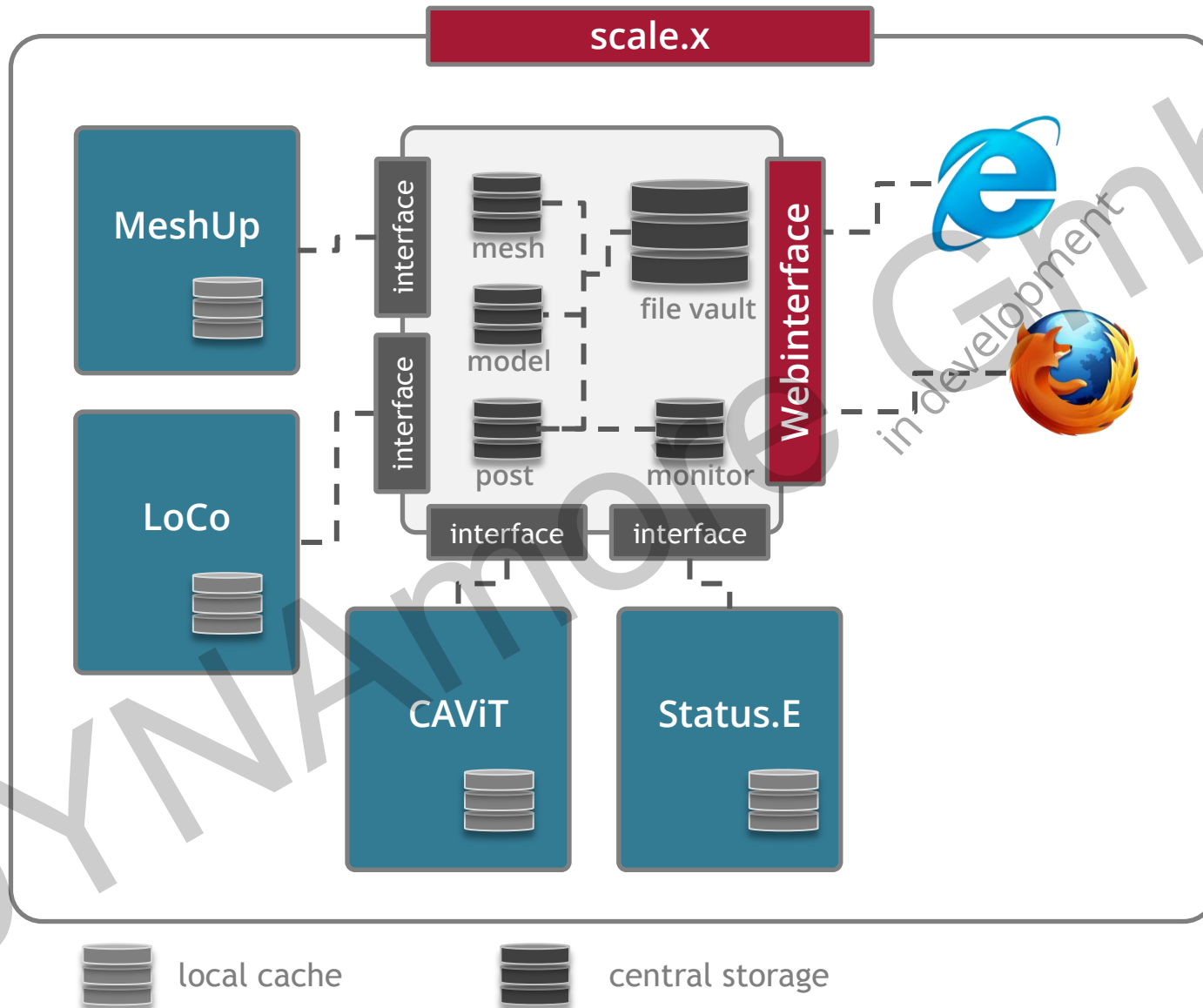
- Report of simulation model status on demand
- Interface focus on established work processes
- Tailored to the needs of simulation engineers



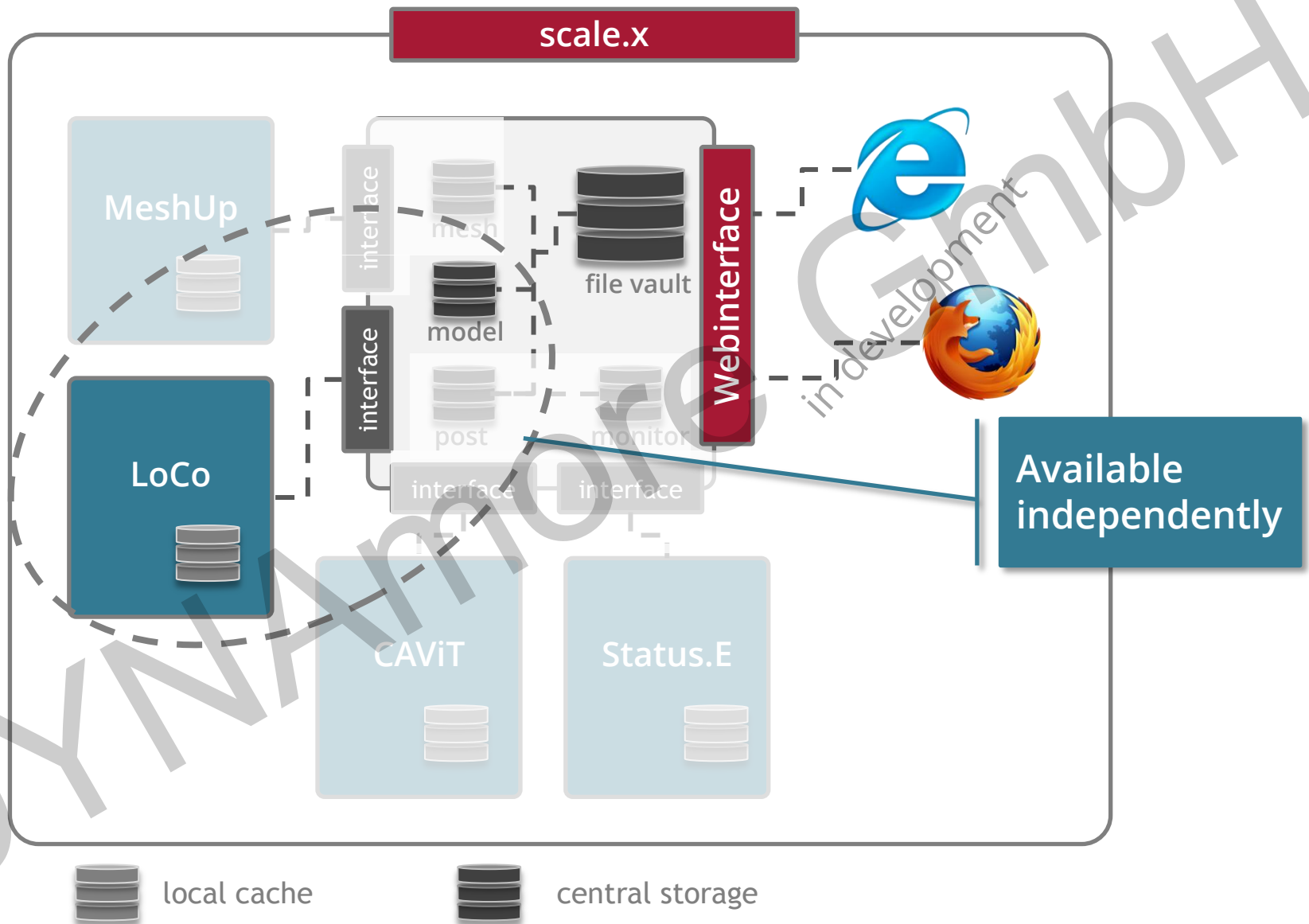
Good Performance

- Largely independent of the performance of the network infrastructure
- Synchronization automatically in the background
- Use of efficient mechanisms for data reduction

scale.x – Framework Architecture



scale.x – Framework Architecture



Vielen Dank!

SCALE 

Status.E

Software Solution for Project Monitoring

October 2014

Copyright SCALE GmbH; Disclosure to third parties only in consultation with SCALE

Status.E – Project Monitoring

■ Project status

- Assembly of assessments on different organizational levels
- Mapping on project mile stones
- Monitoring of project status
- Report generation

■ Project documentation

- Integrated document management system
- Documents are available offline (local cache)

■ Offline clients

- Windows
- iOS



Status.E – GUI Overview






Status.E trunk - g6gaf3w (DD/AST-241) @ Entwicklungs-System


Projekt Admin Ansicht Extra

Projektauswahl X AU312 Lastfallpool

Neues Projekt... Alle Projekte laden

Filtern nach
Projekt-Erweiterung: keine, 0, 1, 2, 3, 4, 5, 6, 7, 8, ... CUI PA PHEV

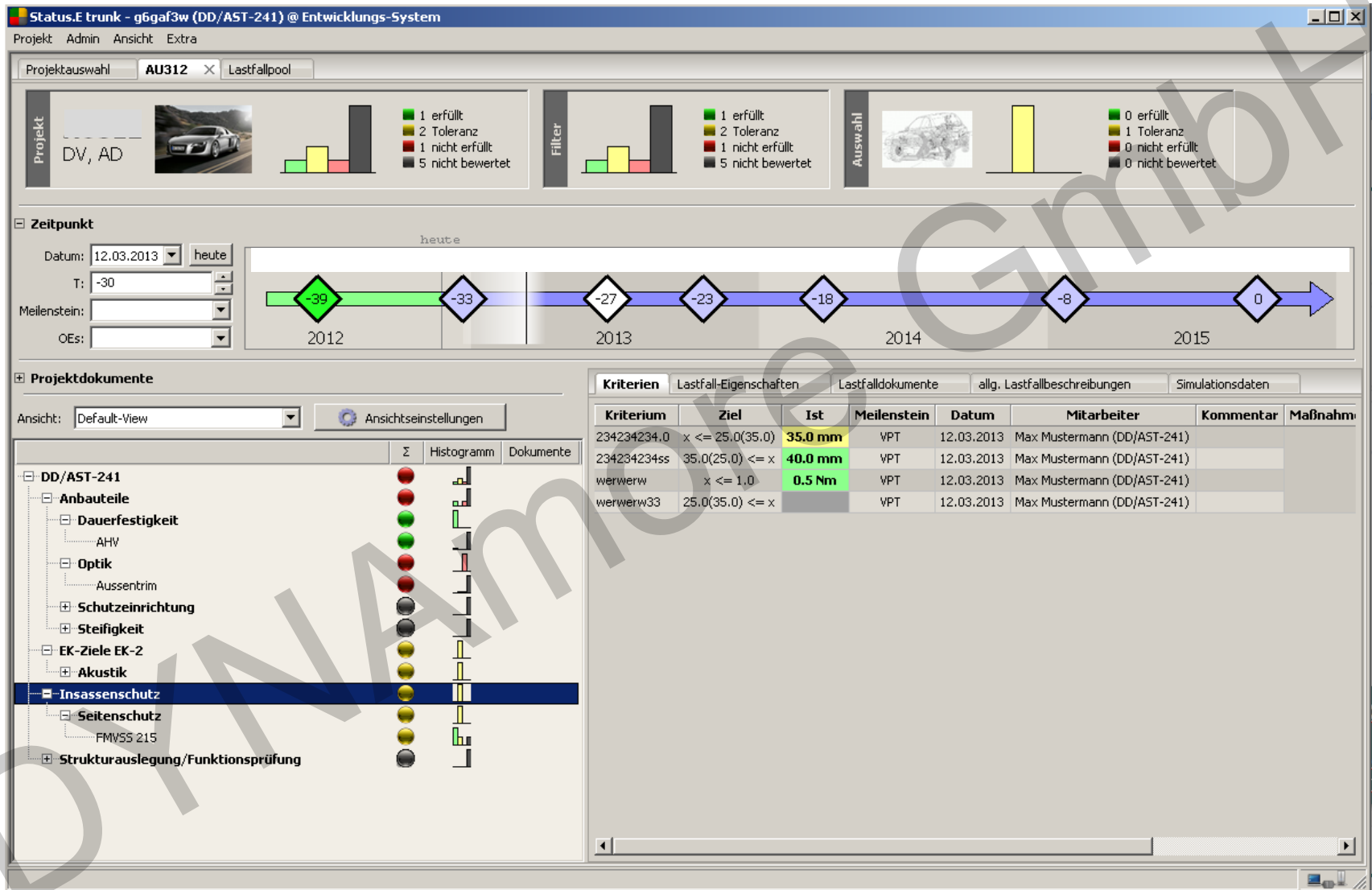
Derivat Klasse	0 (Steilheck)	1 (Stufenheck)	2 (Avant)	3 (Sportback)	4 (Coupé...)	5 (Cabrio...)	6 (SUV...)	7 (Cityvan...)
2 (A0)								
3 (A)								
4 (B)								
5 (C)								
6 (D)								
7 (E)								

Modulprojekte:

Sitzmodul

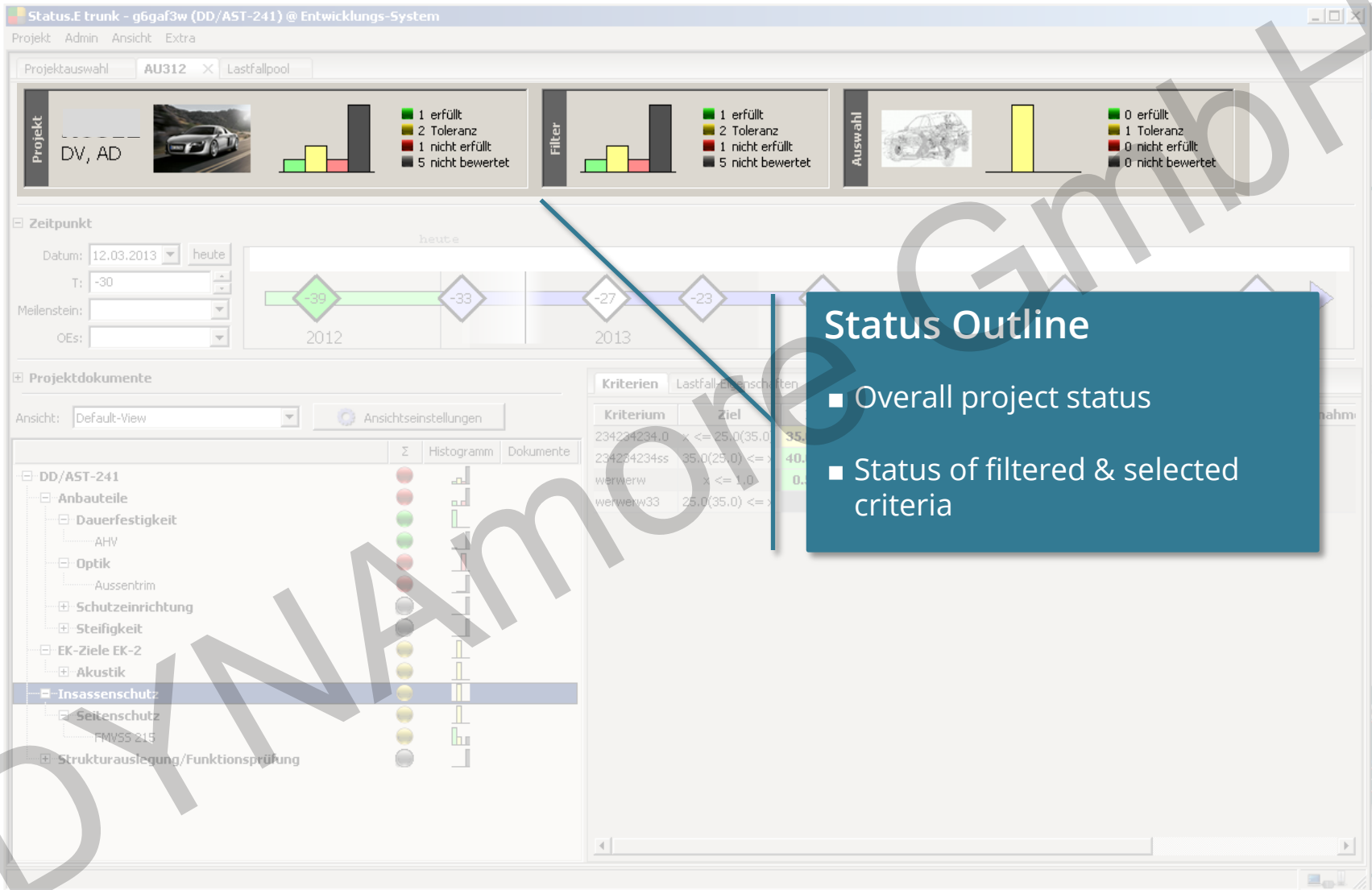
Product portfolio

- Display of projects
- Exposed by car classification and model type

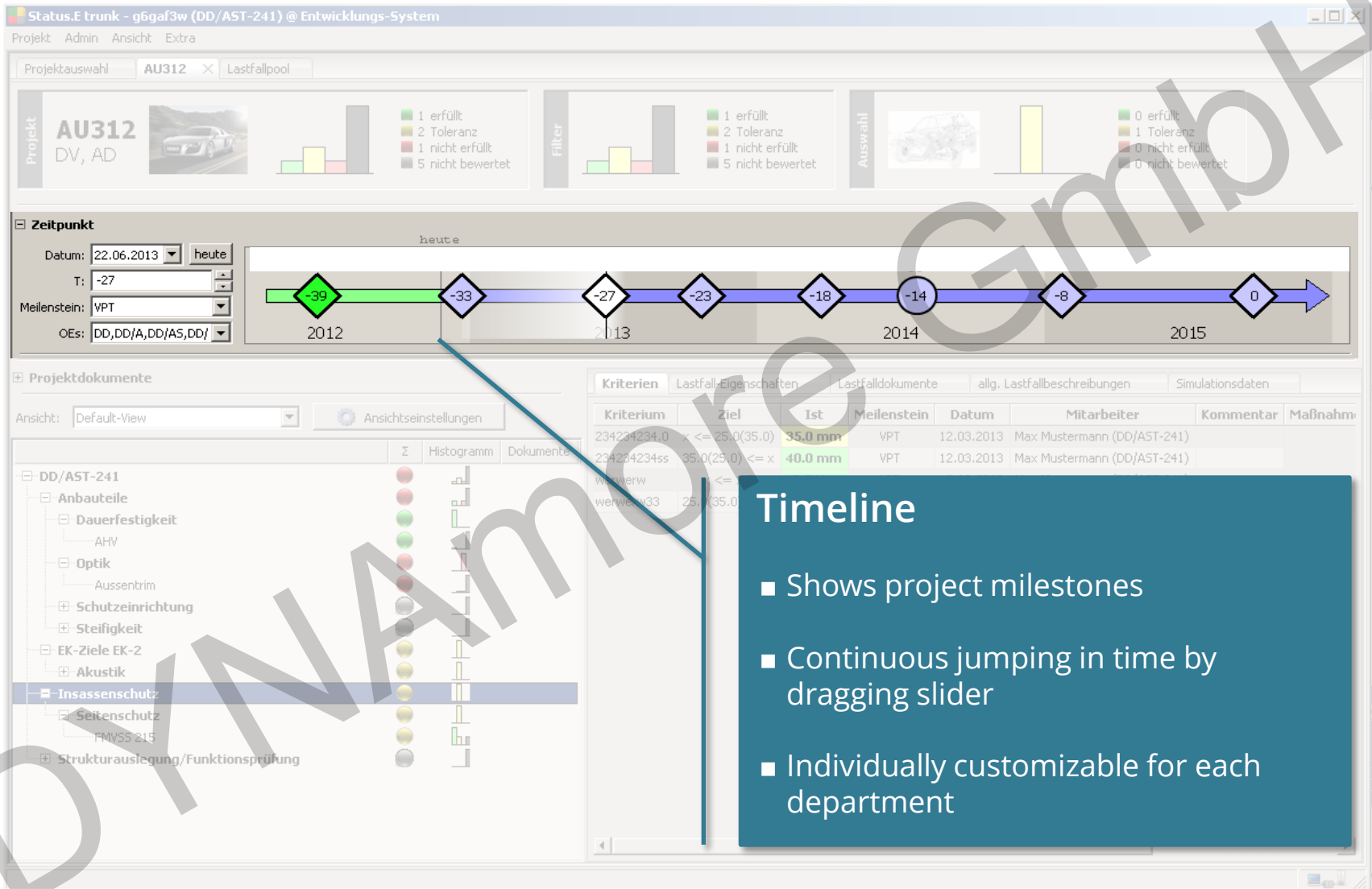
Status.E – GUI Overview



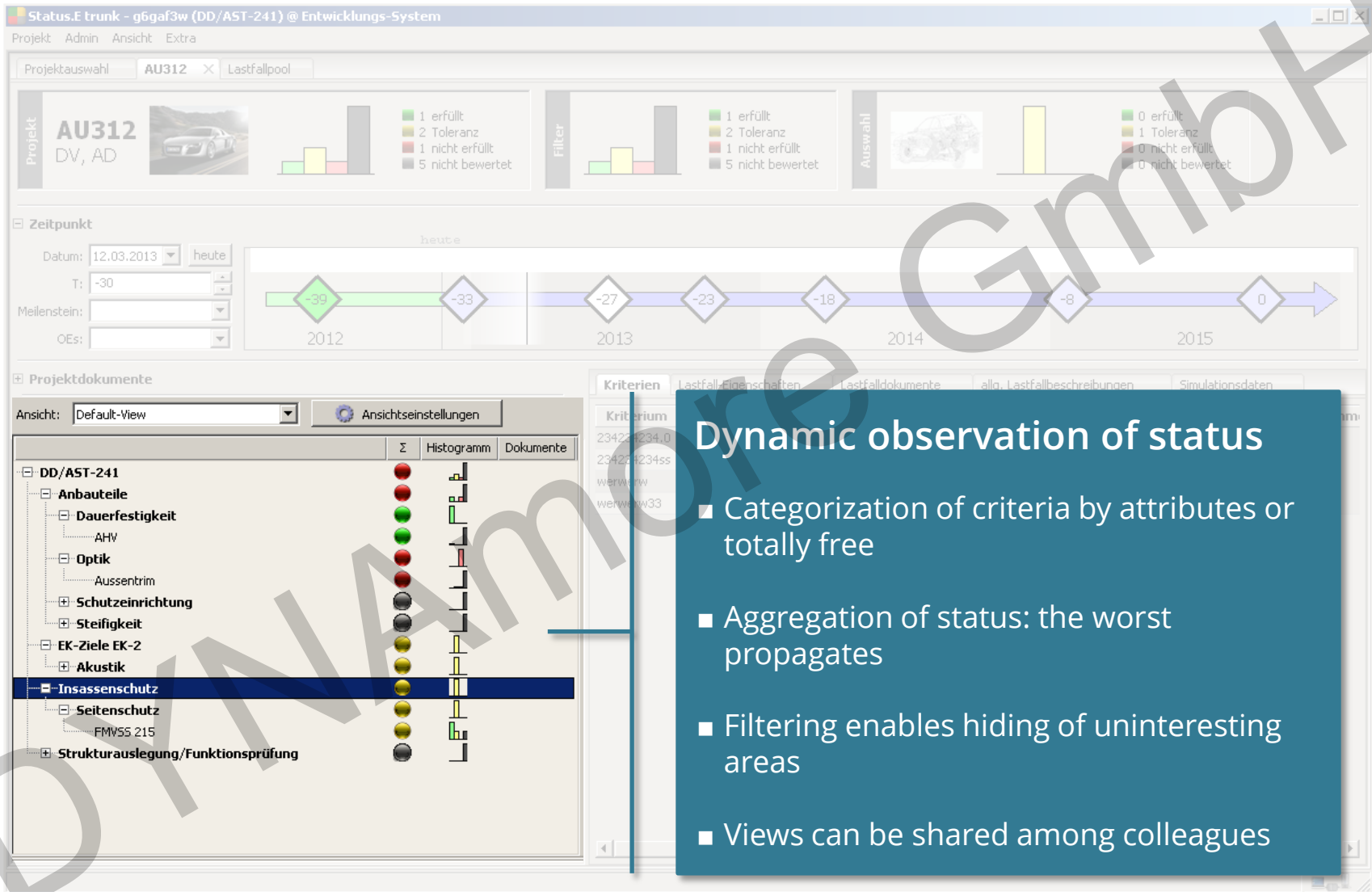
Status.E – GUI Overview



Status.E – GUI Overview



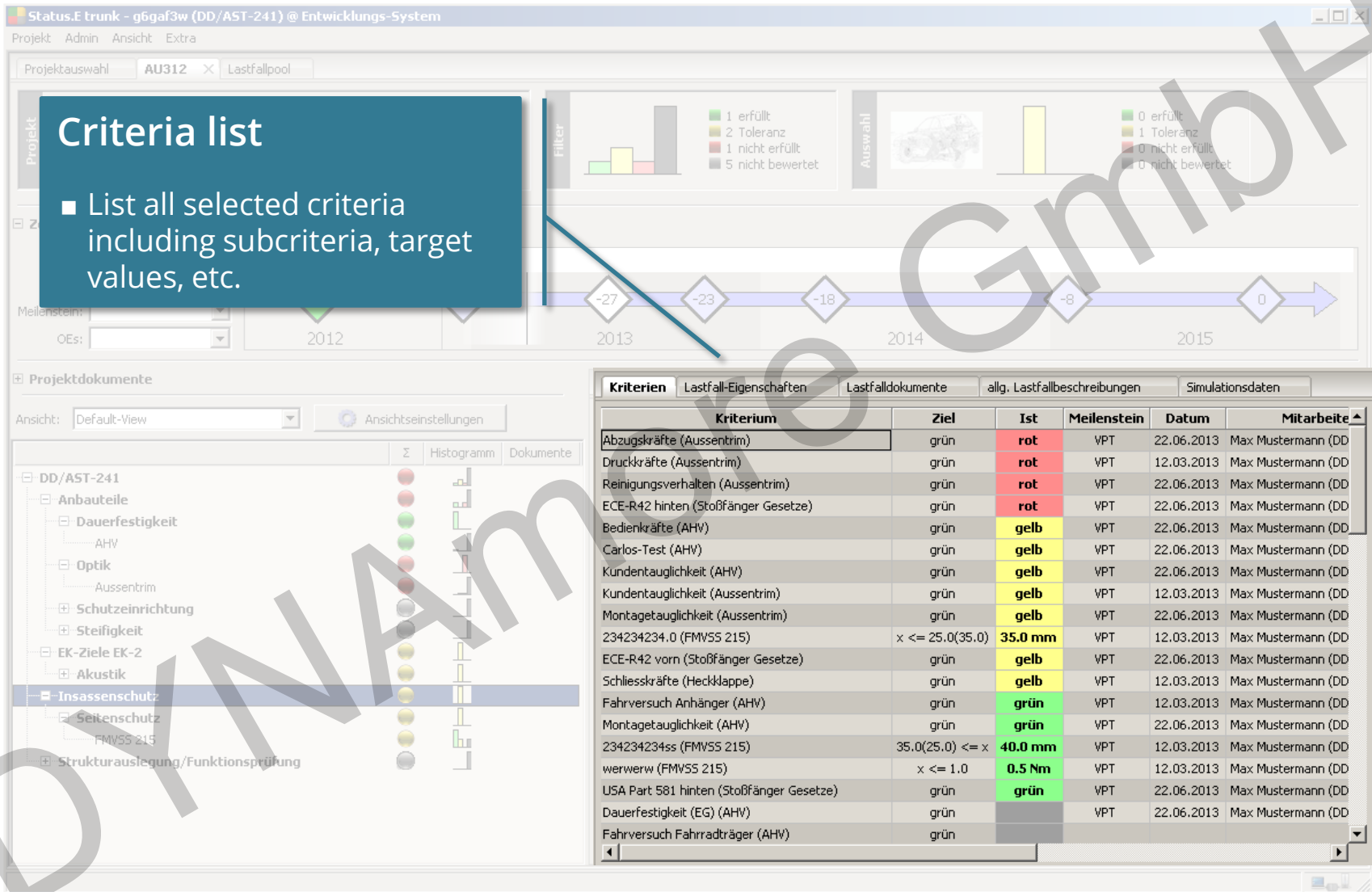
Status.E – GUI Overview



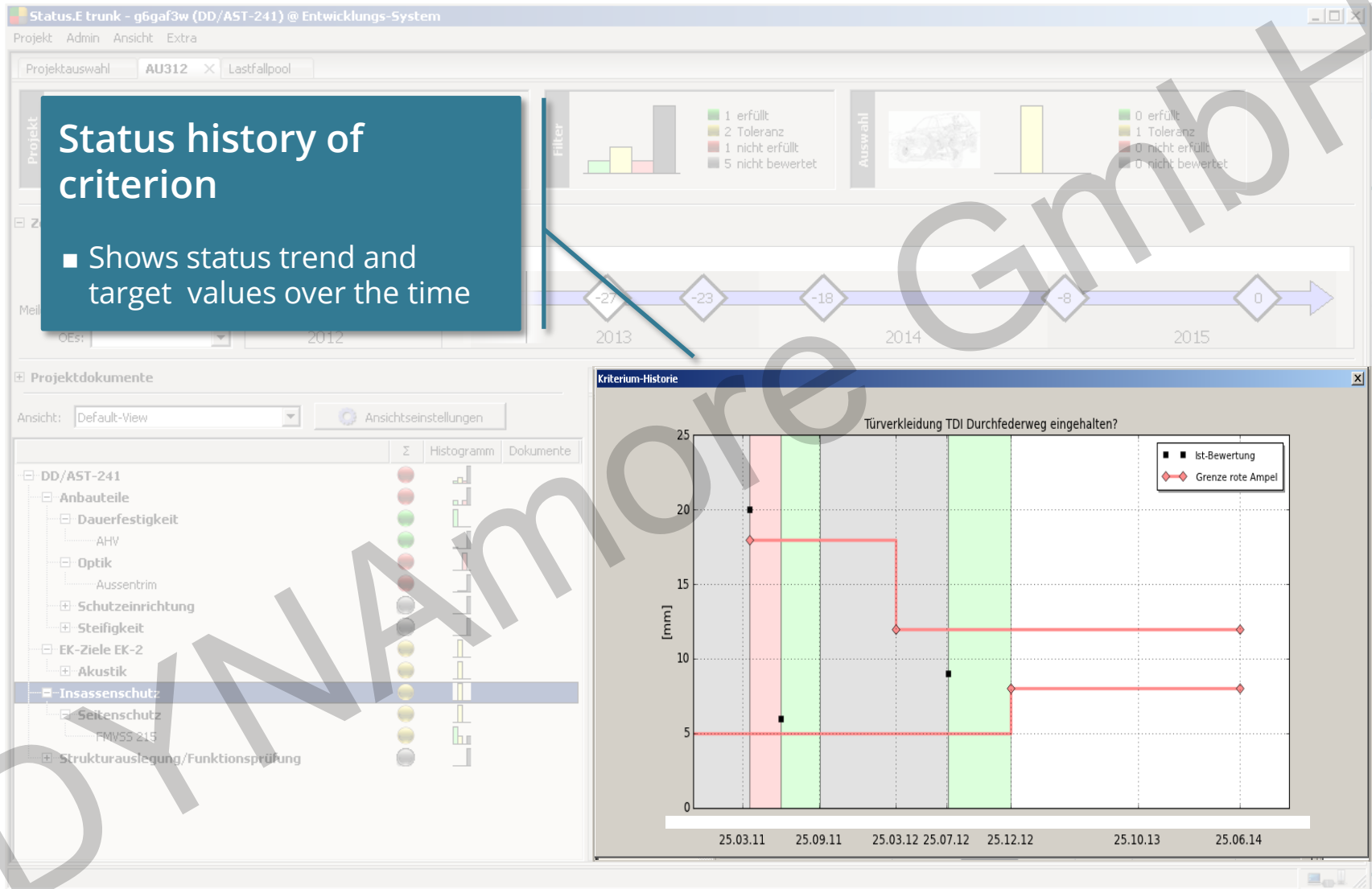
Dynamic observation of status

- Categorization of criteria by attributes or totally free
- Aggregation of status: the worst propagates
- Filtering enables hiding of uninteresting areas
- Views can be shared among colleagues

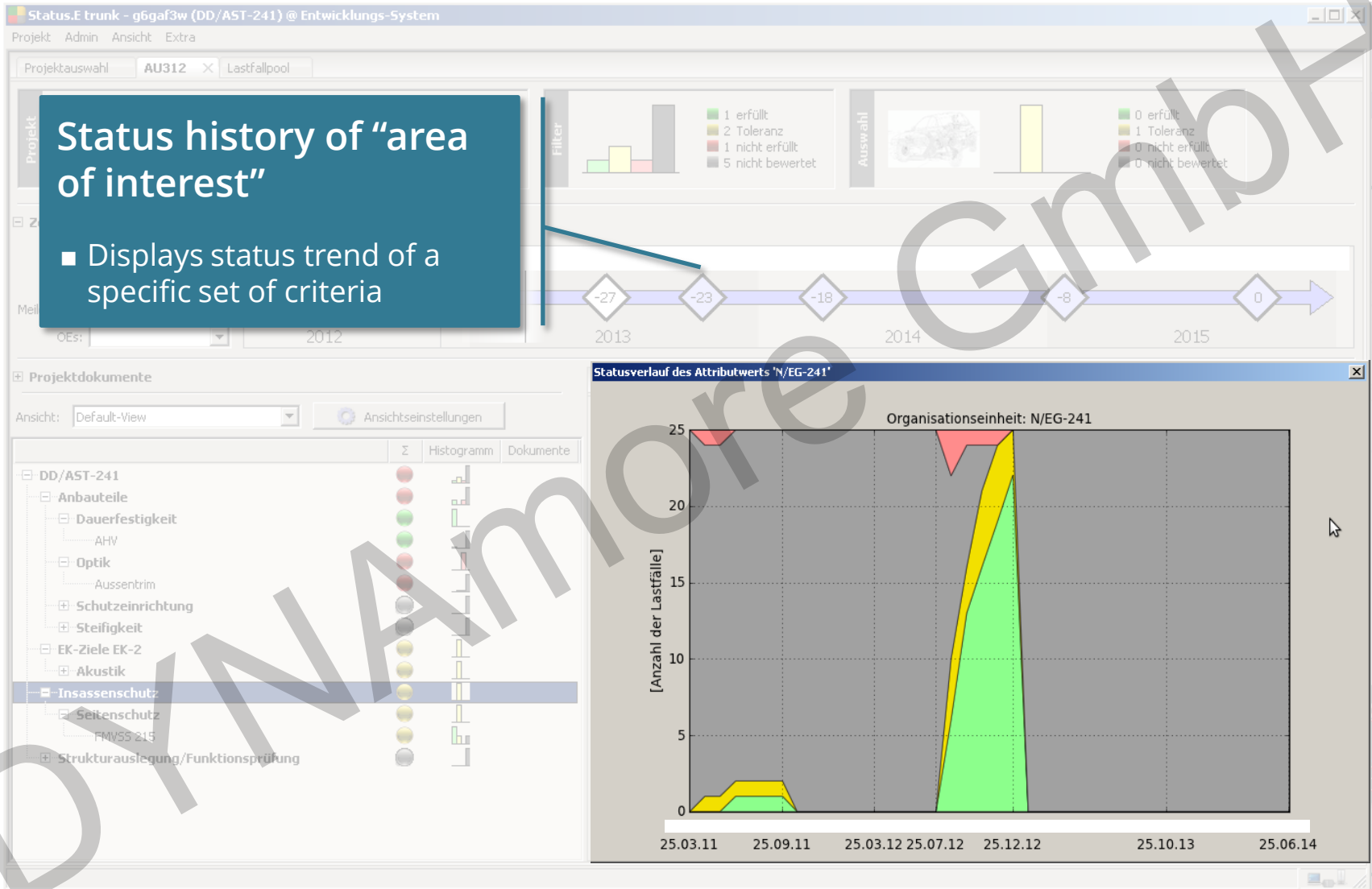
Status.E – GUI Overview



Status.E – GUI Overview



Status.E – GUI Overview



Status.E – GUI Overview

Status.E trunk - g6gaf3w (DD/AST-241) @ Entwicklungs-System

Projekt: Admin Ansicht Extra

Projektauswahl: AU312 x Lastfallpool

Detailed history of criterion

- All changes on a criterion can be listed and manipulated

Filter: 1 erfüllt, 2 Toleranz, 1 nicht erfüllt, 5 nicht bewertet

Auswahl: 0 erfüllt, 1 Toleranz, 0 nicht erfüllt, 0 nicht bewertet

Zeitpunkt: 2013, 2014, 2015

Projektdokumente: Ansicht: Default-View, Ansichtseinstellungen

DD/AST-241

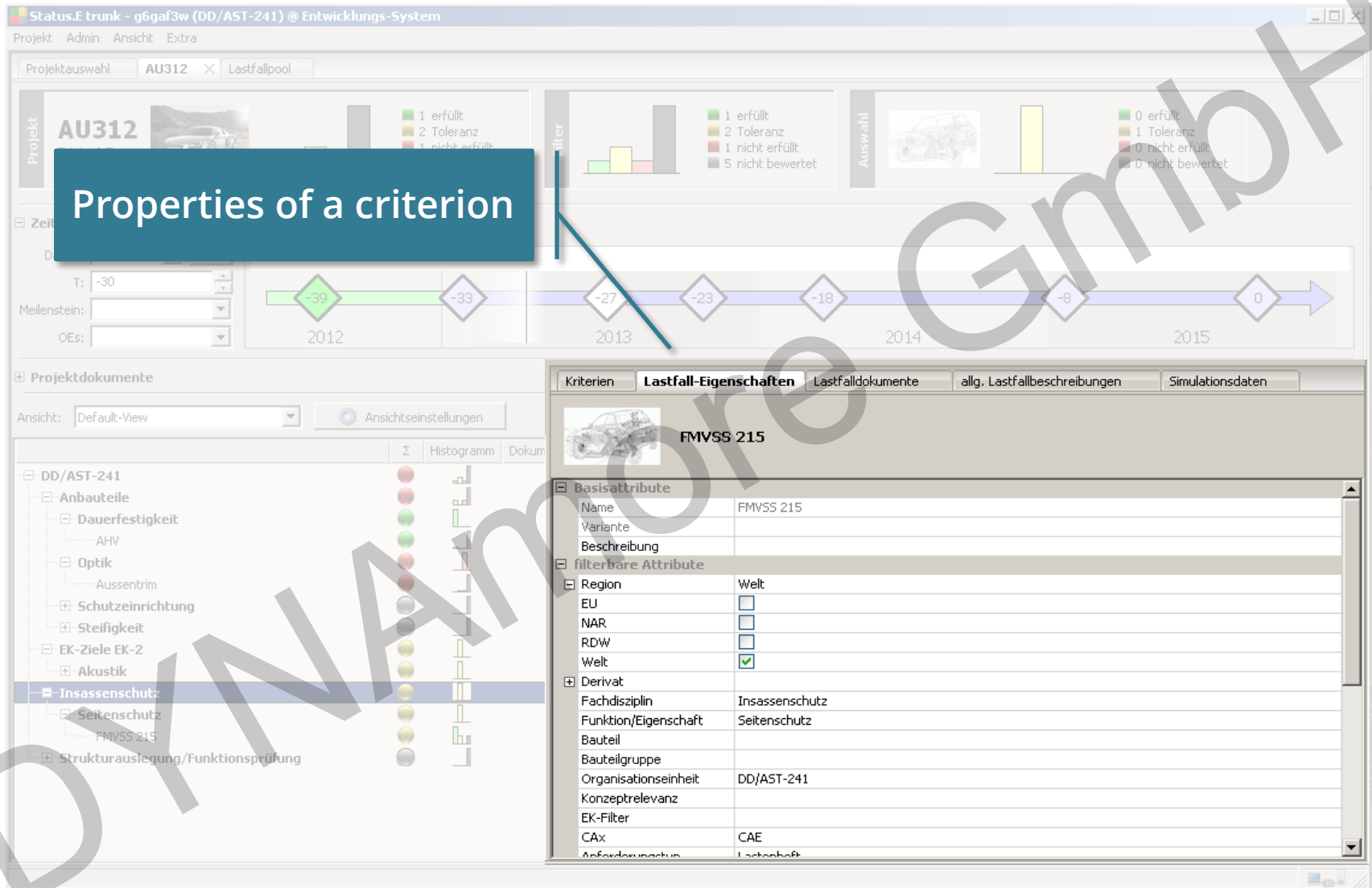
- Anbauteile
 - Dauerfestigkeit
 - AHV
 - Optik
 - Aussentrim
 - Schutzeinrichtung
 - Steifigkeit
 - EK-Ziele EK-2
 - Akustik
 - Insassenschutz
 - Seitenschutz
 - FMVSS 215
 - Strukturauslegung/Funktionsprüfung

Historie des Lastfalls AHV

Zeitpunkt	Art der Änderung	Wert	Nutzer	Eingabezeitpunkt
1.VKF				
2.VKF				
X5X5X				
14.Mar.2011				
Carlos-Test: Ist-Bewertung	gelb		Max Mustermann (N/EG-241)	14.03.2011, 09:29 Uhr
Carlos-Test: Ist-Bewertung	gelb		Max Mustermann (N/EG-241)	14.03.2011, 09:29 Uhr
Kundentauglichkeit: Ist-Bewertung	gelb		Max Mustermann (N/EG-241)	14.03.2011, 09:31 Uhr
Dauerfestigkeit (EG): Ist-Bewertung	gelb		Max Mustermann (N/EG-241)	14.03.2011, 09:35 Uhr
Dauerfestigkeit (EG): Ist-Bewertung	grau		Max Mustermann (N/EG-241)	14.03.2011, 09:49 Uhr
Dauerfestigkeit (EG): Ist-Bewertung	grau		Max Mustermann (N/EG-241)	14.03.2011, 09:53 Uhr
Fahrversuch Fahrradträger: Ist-Bewertung	grau		Max Mustermann (N/EG-241)	14.03.2011, 09:53 Uhr
Fahrversuch Anhänger: Ist-Bewertung	grau		Max Mustermann (N/EG-241)	14.03.2011, 10:08 Uhr
Bedienkräfte: Ist-Bewertung	gelb		Max Mustermann (N/EG-241)	14.03.2011, 10:12 Uhr
15.Mar.2011				
Carlos-Test: Ist-Bewertung	grün		Max Mustermann (N/EG-241)	15.03.2011, 14:19 Uhr
17.Mar.2011				
manuelle Statusüberschreibung	grün		Max Mustermann (N/EG-241)	-
Lastfallkommentar	Bemerkung		Max Mustermann (N/EG-241)	-
Maßnahme	Maßnahme		Max Mustermann (N/EG-241)	-
VPT				
P-frei				
B-frei				
Vorserie				
SOP				

Ansichtsfiler: Rücksetzen, Abbruch, OK

Status.E – GUI Overview



Status.E – GUI Overview

Status.E trunk - g6gaf3w (DD/AST-241) @ Entwicklungs-System

Projekt Admin Ansicht Extra

Projektauswahl AU312 Lastfallpool

Documents and links attached to

- Project
- Criterion
- Set of criteria
- Simulation

Filter

Auswahl

Zeitplan

Daten

Meilenstein

Projekttdokumente

Ansicht: Default-View

Ansichtseinstellungen

DD/AST-241

- Anbauteile
- Dauerfestigkeit
- AHV
- Optik
- Aussentrim
- Schutzeinrichtung
- Steifigkeit
- EK-Ziele EK-2
- Akustik
- Insassenschutz**
- Seitenschutz
- FMVSS 215
- Strukturauslegung/Funktionsprüfung

1 erfüllt
2 Toleranz
1 nicht erfüllt
5 nicht bewertet

0 erfüllt
1 Toleranz
0 nicht erfüllt
0 nicht bewertet

2013 2014 2015

Kriterien Lastfall-Eigenschaften Lastfalldokumente

Name	Größe	Typ	Zuletzt geänd...	Meilen...
dummsitz.png	104.7kB	Bild	25.11.12	VPT
A03511203.xlsx	10.9kB	Excel-Tabelle	25.11.12	VPT
sequence.png	41.7kB	Bild	25.11.12	VPT
status.e.eap	5.6MB	Dokument	25.11.12	VPT

allg. Lastfallbeschreibungen

Name	Größe	Typ	Zuletzt geänd...
admin_icon.png	584B	Bild	25.11.12
print.pdf	25.1kB	PDF-Dokument	25.11.12

Simulationsdaten

Name
db.a3db
archive.tar.bz2

Status.E – GUI Overview

Generation of reports (*.pptx) of “areas of interest” is just one click...

The screenshot displays the Status.E software interface. At the top, the title bar reads 'Status.E trunk - g6gaf3w (DD/AST-241) @ Entwicklungs-System'. Below it, a menu bar includes 'Projekt', 'Admin', 'Ansicht', and 'Extra'. The main window is divided into several sections. On the left, a tree view shows the project structure under 'DD/AST-241', including 'Anbauteile', 'Dauerfestigkeit', 'Optik', 'Aussentrim', 'Schutzeinrichtung', 'Steifigkeit', 'EK-Ziele EK-2', 'Akustik', 'Insassenschutz', 'Seitenschutz', 'FMVSS 215', 'Strukturauslegung/Funktionsprüfung', 'Schutzeinrichtung', 'Stoßfänger Gesetze', 'Typschaden', and 'Typschaden'. A vertical bar with colored circles (green, yellow, red) is next to this tree. In the center, a table titled 'Manuelle Statusüberschreibung' lists various criteria and their status. A small dialog box titled 'Erstellen eines Powerpoint-Reports' is open, showing 'Lastfallfolien: AHV' and a progress bar. The table has columns for 'Kriterium', 'Ziel', 'Ist', 'Meilenstein', 'Datum', and 'Mitarbeiter'. The 'Ist' column contains status indicators like 'rot', 'gelb', and 'grün'. The 'Meilenstein' column contains values like 'VPT' and '35.0 mm'. The 'Datum' column contains dates like '22.06.2013' and '12.03.2013'. The 'Mitarbeiter' column contains the name 'Max Mustermann (DD)'. A large 'DYNAMORE GmbH' watermark is visible across the center of the image.

Kriterium	Ziel	Ist	Meilenstein	Datum	Mitarbeiter
Reinigungsverhalten (Aussentrim)	grün	rot	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	rot	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	gelb	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	gelb	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	gelb	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	gelb	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	35.0 mm	VPT	12.03.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	gelb	VPT	22.06.2013	Max Mustermann (DD)
Reinigungsverhalten (Aussentrim)	grün	gelb	VPT	12.03.2013	Max Mustermann (DD)
Fahrversuch Anhänger (AHV)	grün	grün	VPT	12.03.2013	Max Mustermann (DD)
Montagetauglichkeit (AHV)	grün	grün	VPT	22.06.2013	Max Mustermann (DD)
Abzugskräfte (Aussentrim)	grün	grün	VPT	22.06.2013	Max Mustermann (DD)
Druckkräfte (Aussentrim)	grün	grün	VPT	22.06.2013	Max Mustermann (DD)
Kundentauglichkeit (Aussentrim)	grün	grün	VPT	22.06.2013	Max Mustermann (DD)
234234234ss (FMVSS 215)	35.0(25.0) <= x	40.0 mm	VPT	12.03.2013	Max Mustermann (DD)
werwerw (FMVSS 215)	x <= 1.0	0.5 Nm	VPT	12.03.2013	Max Mustermann (DD)
USA Part 581 hinten (Stoßfänger Gesetze)	grün	grün	VPT	22.06.2013	Max Mustermann (DD)
Dauerfestigkeit (EG) (AHV)	grün		VPT	22.06.2013	Max Mustermann (DD)
Fahrversuch Fahrradträger (AHV)	grün				
Montage-/Demontage (AHV)	grün				
Formstabilität (Aussentrim)	grün				
Montage-/Demontage am Band (Aussentrim)	grün				
RKD (Aussentrim)	grün				

Status.E – Data Import

- Type in manually
- Excel interface

Microsoft Excel - lastest.senpaul.de

DateiEinfügenFormatE

Interface with 3rd party systems (e.g. CAViT, CAE-Bench) possible

Status.E - Summary



Criteria assessment

Simulation and test driven criteria can be assessed. Integration of 3rd-party systems allows automatic assessment.



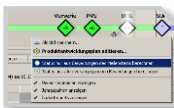
Individual observation of project status

Areas of interest can be focused based on criteria attributes.



Reporting

Monitoring reports can be generated as PPT-slides or shown as live demonstration



Versioning

Criteria assessment is never lost or overwritten. An optical time line enables the user to jump in time intuitively.



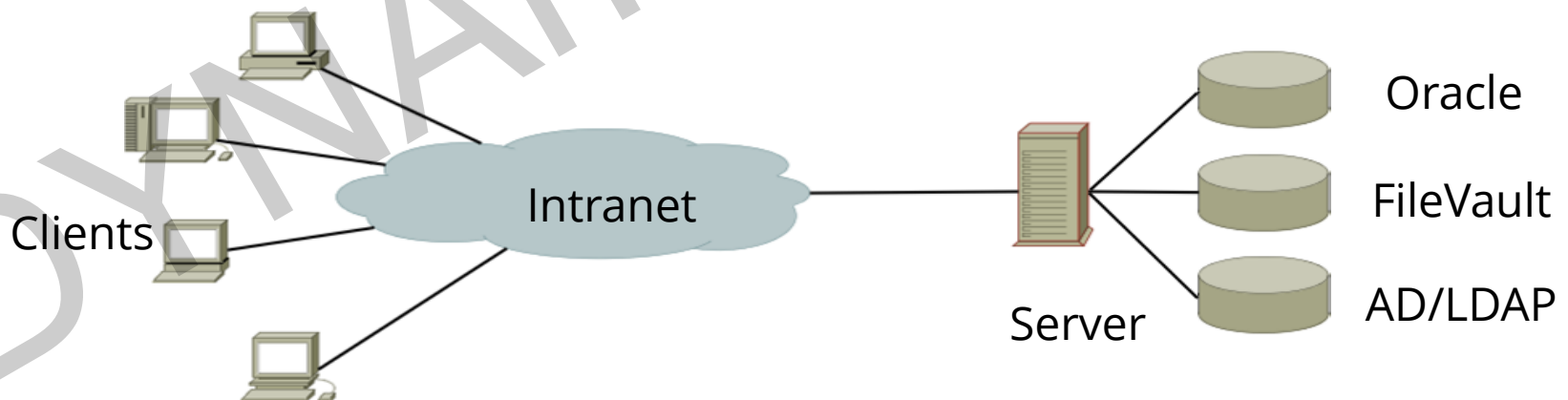
Documentation

Arbitrary documents can be attached to assessments and become globally accessible (document management system)

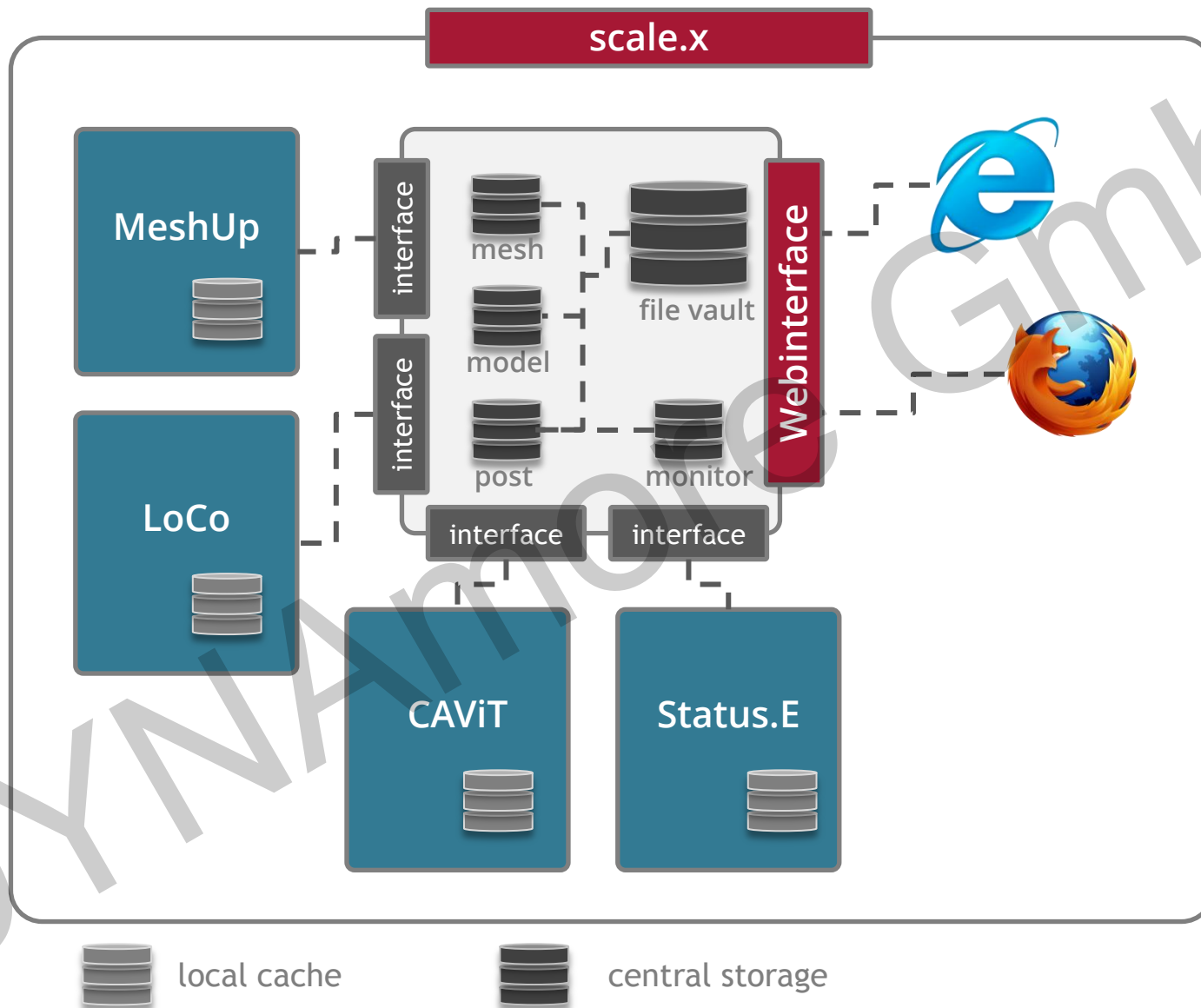
Status.E – IT Aspects

■ Client-Server Architecture

- RichClients available for all Windows versions without any dependencies
- RichClient-Distribution via Java Webstart
- WebClient in development
- Server-Application based on Java Enterprise; Server Database, e.g. Oracle
- Comprehensive role right management (configurable)
- Central document storage in secure FileVault
- Extensive protection of sensitive data by various security methods
 - Encrypted data storage and transfer
 - two-factor authentication, ...



scale.x – Framework Architecture



scale.x – Framework Architecture

