New Concepts in CAE Data and Process Management in Car Development

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Case Study 1

CAE data and variant management, administration of data, collaborative work, integrated documentation

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Case Study 2

Automation of result extraction, reporting, comparison simulation/testing



Case Study 3

Monitoring of development status











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Case Study 1

CAE data- and variant management, administration of data, collaborative work, integrated documentation



Case Study 2

Automation of result extraction, reporting, comparison simulation/testing



Case Study 3

Monitoring of development status



Software System for Management of Simulation Input Data

- Target Group
 - CAE-engineers
 - Leader of simulation projects



Motivation

- Synergy Sharing of common parts
- Transparency Integrated documentation
 - **Consistency** Synchronisation within all project members
 - **Time Savings** Automation of processes
- Homogeneity Unif
 - Unification of the simulation data and enforce standards



Case Study 1: Workflow, Teamwork and Synchronization









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Case Study 1: Open System / Integration of Software

Direct application of external tools (Ansa, Animator, nedit, vi, Userskrips, 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









Summary - Case Study 1



Customizable Rich Client

- Adaptation to customer requirements
- Structuring / standardizing of 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

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Intuitive Usage

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

Very Good Performance

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



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Case Study 1

CAE data- and variant management, administration of data, collaborative work, integrated documentation



Case Study 2

Automation of result extraction, reporting, comparison simulation/testing



Case Study 3

Monitoring of development status



Case Study 2: Analysis and Evaluation of CAx Data





Case Study 2: Analysis and Evaluation of CAx Data

Software System for Data Collection and Evaluation of Test- and Simulation Data

- Target Group
 - Test and simulation engineers
 - Component responsible people



Motivation

Integration	Merging experimental and simulation data
Evaluation	Support for automatic creation of standardized documentation / reports
Assessment	Semi-automated evaluation and acquisition of key evaluations of individual experiments / simulations
Comparison	Identification of differences between experiment and simulation



Case Study 2: Analysis and Evaluation of CAx Data



Characterization

- Data collection from several backend systems
- Cache of data for fast local access, particularly important for bulk data
- Uniform handling of test and simulation data
- Agglomerated view of data [configurable] Pedigree representation



Visualization Features

- Graph / pedigree
- Table view
- Matrix representation
- User Configurable View
- Automated color based assessment of results
- Representation of team project status

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Case Study 2: Scripting Extension - Open System

- Functionalities can be extended by user through "Scripting Extensions"
- Arbitrary script languages can be applied
- Template technology is cross platform available (Windows and Linux)
- Application
 - Automation of report generation
 - Interface to other applications





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Classification Motivation

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Case Study 2

Automation of result extraction, reporting, comparison simulation/testing



Case Study 3

Monitoring of development status





Project Monitoring & Reporting

- Aggregation of assessments within CAE- team/department
- Mapping on project mile stones
- Monitoring of project status
- Report generation



Case Study 3: Project- and Status Monitoring

Monitoring - Project status at a milestone



- Temporal allocation of simulation and experimental results on milestones
- Input of assessment data by
 - Interactive, GUI
 - Excel lists
 - Interfaces to other software applications





Case Study 3: Project- and Status Monitoring

Assessment of a single status at a specific date

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More features

Project Overview

- Assessment of development state on demand
- Who is responsible?
- Statistics (feasible/infeasible design properties)



- Rights management to secure visibility and modifications
- Identification of critical project situations, comparison of projects



Reporting - automated generation of *.ppt project reports



- Selection of scope and layout of reports
- Reports can contain links to more detailed information
- Integration of additional more detailed report documents



overview of assessment Date brothelen gracht Dirligen Format, Egnes Status: Statusbericht 1 4 Überblick ehnt an Gesetze RdW: 64km/h 40% ODB * • MVSS208 Phase 2 56km/h 100% starr akti 8 H ase 2 40km/h 100% starr passiv - 0 Econternal H 4mlh 100% starr passiv - 30 EuroNCAP 64kmlh 40% ODB ----NDOB4030 4-2-A-========

all load cases of a discipline

Image: Section of the section of t

specific load case





Case Study 3: Management of Documents

Dedicated assessment documents and reports

Attachment of documents to load cases, disciplines, projects



Allocation of final reports to mile stones





Summary

- Innovative software products increase efficiency, reliability and sustainability in the vehicle development
- Introduced software systems have been developed with AUDI and VW in very close cooperation with engineering departments
- Increasing acceptance for data and process management systems in simulation departments



Thanks for your attention!



