

FUTURE ENGINEERING DATA MANAGEMENT

Data-driven Product Development with a Single System
for all Engineering Data

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Christopher Woll | 11-13 October 2022

Future Engineering Data Management

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Technical Lead:

Combines Deep Knowledge of Engineering and Digitalization

„ENGINEERING 4.0 WON'T BE POSSIBLE WITHOUT SIMULATION“

GNS Systems

IT for Virtual Engineering

Independent Specialist
for Big Compute and Engineering Data

GNS Group
about 250 IT Specialists and Simulation Experts Worldwide

Broad Partner Network
with Special Cloud Expertise

HPC Infrastructures & Workflows:
Complete Automation of Engineering Processes
- On-premises, Hybrid or in the Cloud

Autonomous Driving:
Reliable Infrastructure, Reliable Software Engineering

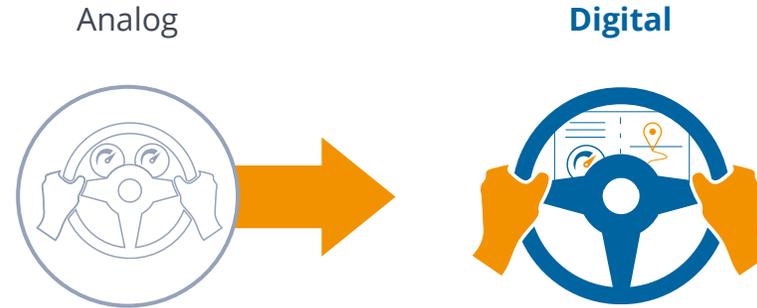
CAE/CAD Data Management & Analytics:
The Intelligent Use of Data and Smart Platforms for Best Practises

Software Engineering:
Enterprise Class, Agile Software Development

The Volume of Data Increases

Today's Vehicle is Becoming More and More Digital

Digital Product



By 2020, the average connected vehicle would

generate **over 280** petabytes of data,

with at least **4 TB** of data being generated in a day.

470 million connected vehicles will hit the roads **by 2025.**

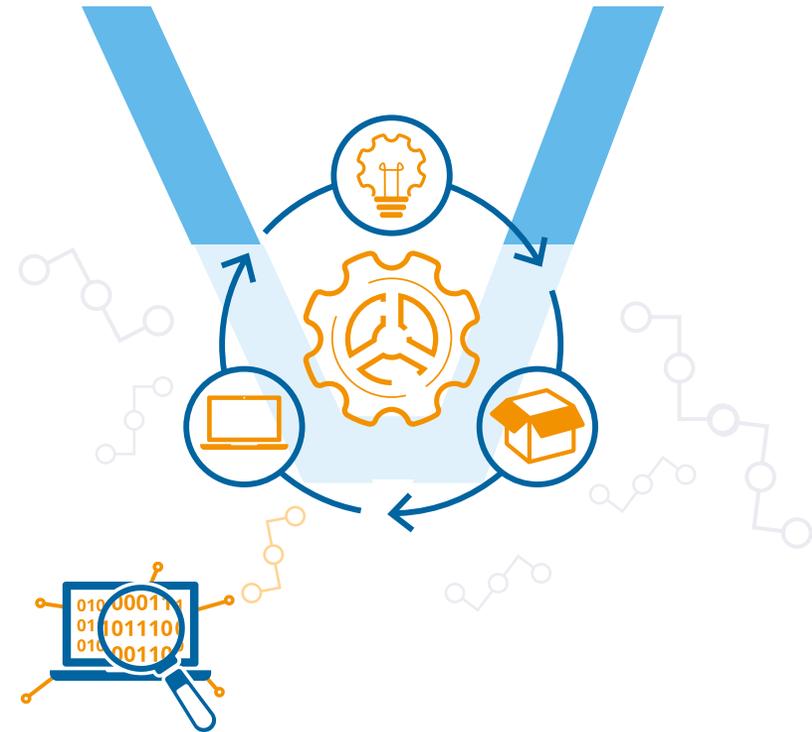
Product Development is Changing

On the Road to Data-Driven Development

Future Product Development

- Agile with continual releases
- More holistic through systems engineering
- Use extensive and complex data from a wide variety of sources

Data-driven development becomes a core competence in engineering



Simulation Data is not like any Other

Challenges in Simulation Data Management (SDM) will be Exacerbated in the Future

General Challenges

- Amount of data
- Variety of data types
- Complexity of data relations
- Complexity of tool and solver environment
- Special volume, bandwidth and performance requirements
- Mapping the simulation process (data model)



Annual data growth between 31 and 60 percent

at every 3rd company in Germany

(source: IDC Germany, Data Driven Intelligence 2021)

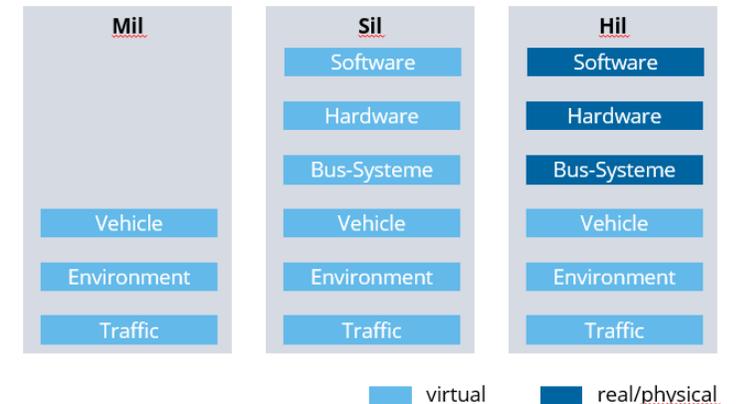


Higher variety of data types

through Multiphysics, co-simulations, hybrid simulations



Even more **Increasing complexity** through the introduction of XiL simulations, systems engineering and data-driven engineering



The Data Landscape Must Cover Various Needs

Mitigate Tensions between Stakeholder Requirements

Variety of Data



3D



1D



Hardware in the Loop (HiL)



Software in the Loop (SiL)



Test



Sensors



Field Data

meets

Stakeholder Needs

CAE Engineer

Efficient work, specific tools, direct data access

Software Developer

Code repositories, development environment, SiL

Data Analysts / Data Engineers

Access to all data

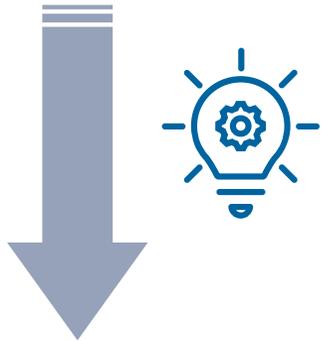


The data environment must offer both:
uniform access and the seamless
integration of specific tools

Cross-system Data Access via a Data Integration Platform (DIP)

Going Beyond the System Boundaries

 **The data environment must offer both:
uniform access and the seamless
integration of specific tools**



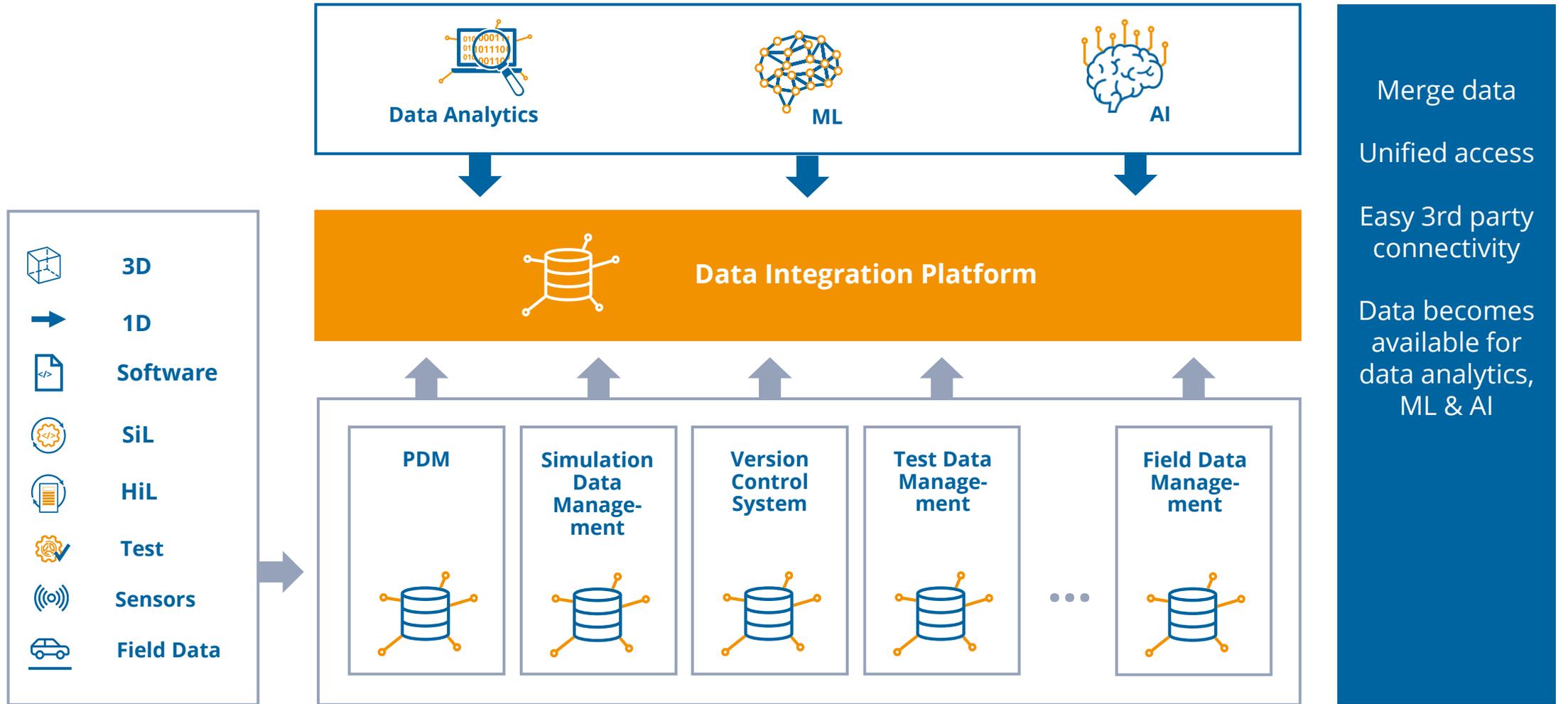
**A Digital Integration Platform is a must
- even for Simulation Data, Test Data
and Field Data**

Benefits:

- ✓ Access to all integrated data
- ✓ Future-proof: covers upcoming data requirements
- ✓ Traceability across system boundaries using the possibilities of DIP
- ✓ Democratization of CAE simulation

Data Integration Platform + AI

Accelerator and Optimizer



Use Cases for the Data Integration Platform

Analysis of Data in its Entirety

Who?

Any Company in their industries

- Automotive
- Life Science
- Manufacturing
- Chemistry
- ...

How?

Make simulation and test data usable on a data integration platform and introduce the necessary methods for efficient workflows.

- Breaking down data silos
- Identification and consideration of relationships
- Optimized analysis options
- Cross-system search for data

What?

Establish a unified, future-proof platform for engineering data for

- Efficient data management
- Higher data integrity
- Increased development speed

Why?

Let future-oriented data driven development become reality.

- Optimization of processes based on new insights
- Increase in efficiency
- Maximum time savings and cost reductions

Consistent Single Source of Truth for engineering data
– Avoid duplication and redundancy in simulation processes and workflows.

TAKING ENGINEERING TO THE NEXT LEVEL

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