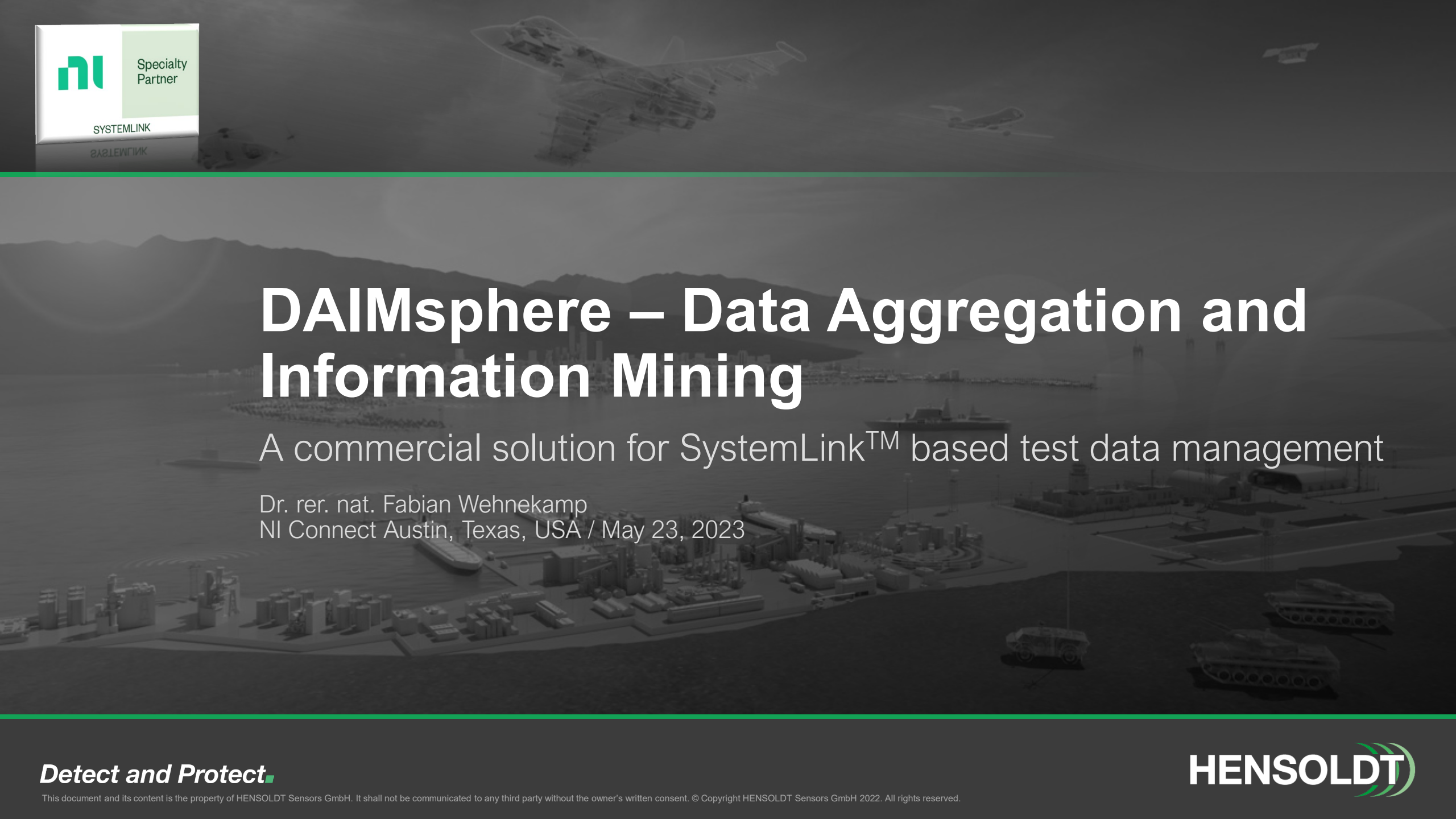

DAIMsphere – Data Aggregation and Information Mining

A commercial solution for SystemLink™ based test data management

Dr. rer. nat. Fabian Wehnekamp
NI Connect Austin, Texas, USA / May 23, 2023

Detect and Protect.

HENSOLDT

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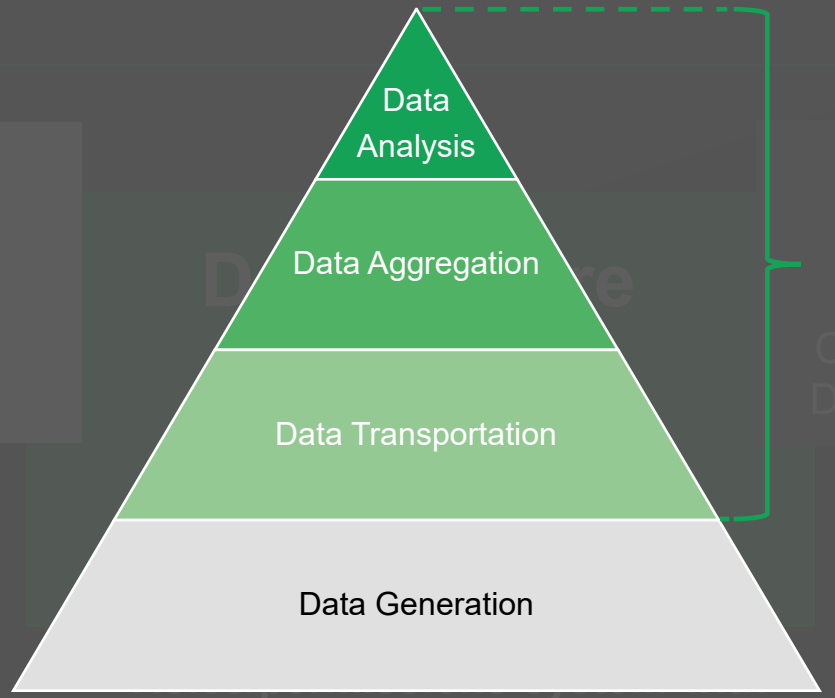
DAIMsphere for Testing Solutions

A commercially available IIoT solution based on SystemLink™



covered by *DAIMsphere*

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DAIMsphere Value Proposition

Test Data Management along the Product Life Cycle

The integration of DAIMsphere leads to valuable benefits:

- ✓ Concurrent engineering through real-time monitoring of test data
- ✓ Business value through reduced cost of non-quality
- ✓ Operational value with process stability, digitalisation and IT security across the board
- ✓ Data export capabilities

"How does DAIMsphere work and how can you benefit from it?!"

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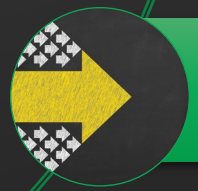
Agenda

About HENSOLDT

The Challenge

Our Solution: DAIMsphere



Summary Value Proposition

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About HENSOLDT

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About HENSOLDT

Pure-play and platform independent provider of sensor solutions for defence and security applications

Addressing multiple attractive markets with state-of-the-art technology in the fields of radar, electronic warfare, avionics, and optronics

European roots, international footprint with production facilities in Germany, France, UK and South Africa as well as sales offices on six continents

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Key figures

Based on the fiscal year 2022

6,463
Employees worldwide

152
Years of heritage

1,707
Revenues in € m

5,366
Order backlog in € m

1,993
Order intake in € m

292
Adjusted EBITDA in € m

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Global footprint

More than 6,400 employees across the globe

Norway
Oslo

Netherlands
Rotterdam

France
Toulouse, Plaisir, Massy, La Couronne, Epreville

United Kingdom
Enfield

Spain
Madrid

Canada
Ottawa, Toronto

USA
Vienna, VA
Sarasota, FL

Mexico
Mexico City

Algeria
Sidi Bel Abbès

Brazil
São Paulo

South Africa
Pretoria, Irene, Cape Town

NI Connect Austin, Texas

Industrial site in Ulm, Germany

Germany
Taufkirchen, Oberkochen, Aalen, Friedrichshafen, Ulm, Pforzheim, Cologne, Berlin, Wetzlar, Koblenz, Kiel, Wilhelmshaven

Denmark
Ballerup

Austria
Vienna

Turkey
Ankara

South Korea
Seoul

India
Bangalore

Singapore
Singapore

Australia

Hobart, Canberra, Newcastle, Adelaide

United Arab Emirates
Abu Dhabi

Saudi Arabia
Riyadh

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Our business

Solutions

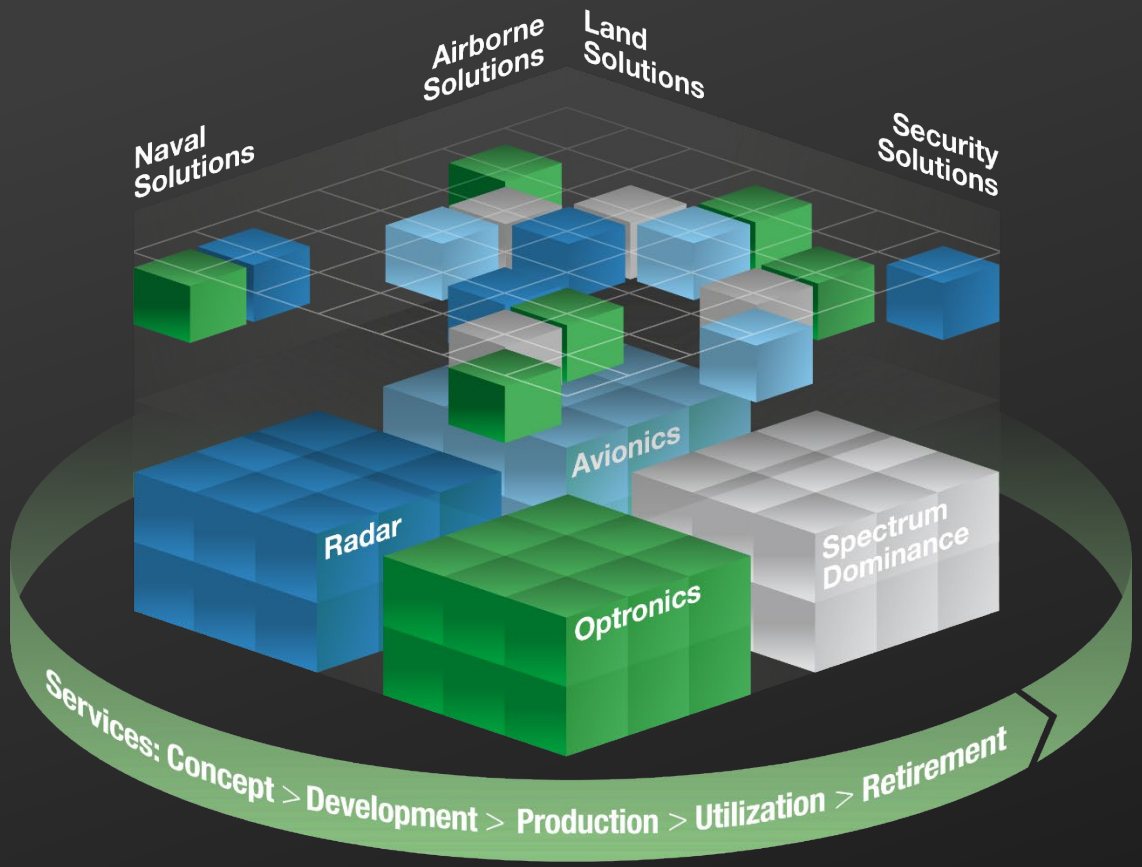
Networked, pre-integrated sensor solutions

Products

Premium sensor systems and electronics

Services

Services for the entire product life-cycle



Testing Solutions…

…along the entire life cycle of our products are part of our HENSOLDT DNA with 30+ years of experience in testing

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The Challenge

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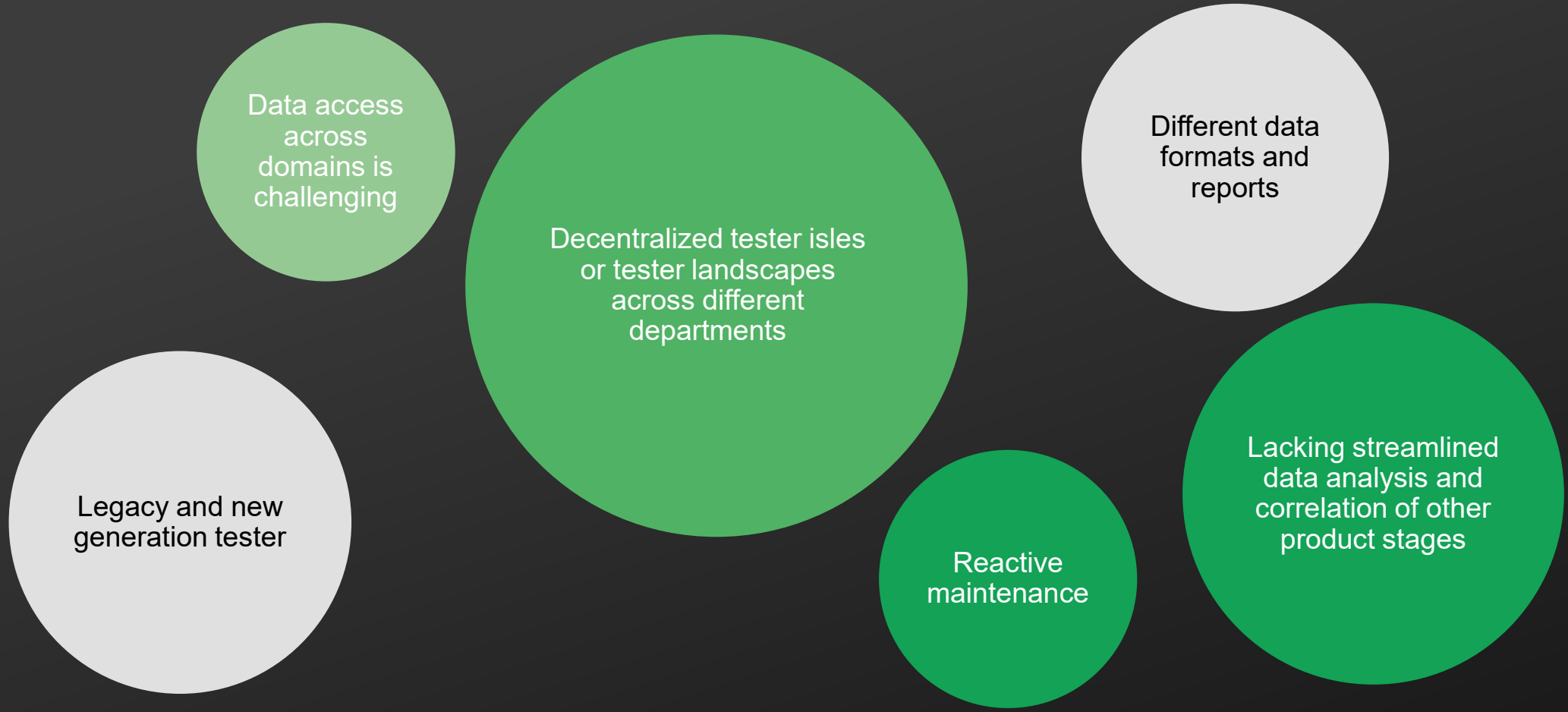
Where we started

Pain points: More complex systems, shrinking time & budgets, managing data remains the real challenge



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Where we are

Goal: To cover the whole test data life cycle within the enterprise

Multi-disciplinary data correlation

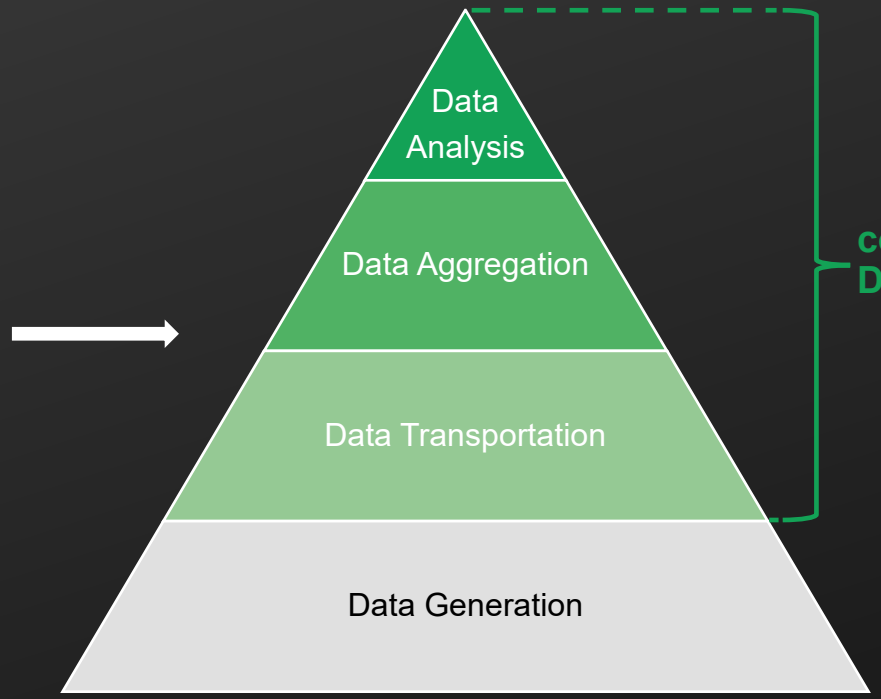
Centralized data storage “Authoritative Source of Truth” with different access levels

Standardized data structure in correlating formats

Conversion of legacy tester data and reports

Analysis tools on multiple product levels

Predictive maintenance



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Our Solution: DAIMsphere

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DAIMsphere software layer structure

Layered approach allows extensions for specific enterprise requirements

DAIMsphere Enterprise Layer:

- Database integration
- Data lake Integration
- Custom extensive analysis capabilities

DAIMsphere
Product Layer

DAIMsphere Product Layer:

- DAIM abstraction layer
- DAIM analysis components
- GDPR conformity & rights management
- Deployment tools

COTS NI SystemLink™

NI SystemLink™ Layer:

- Commercial of the shelf
  Components provided by NI

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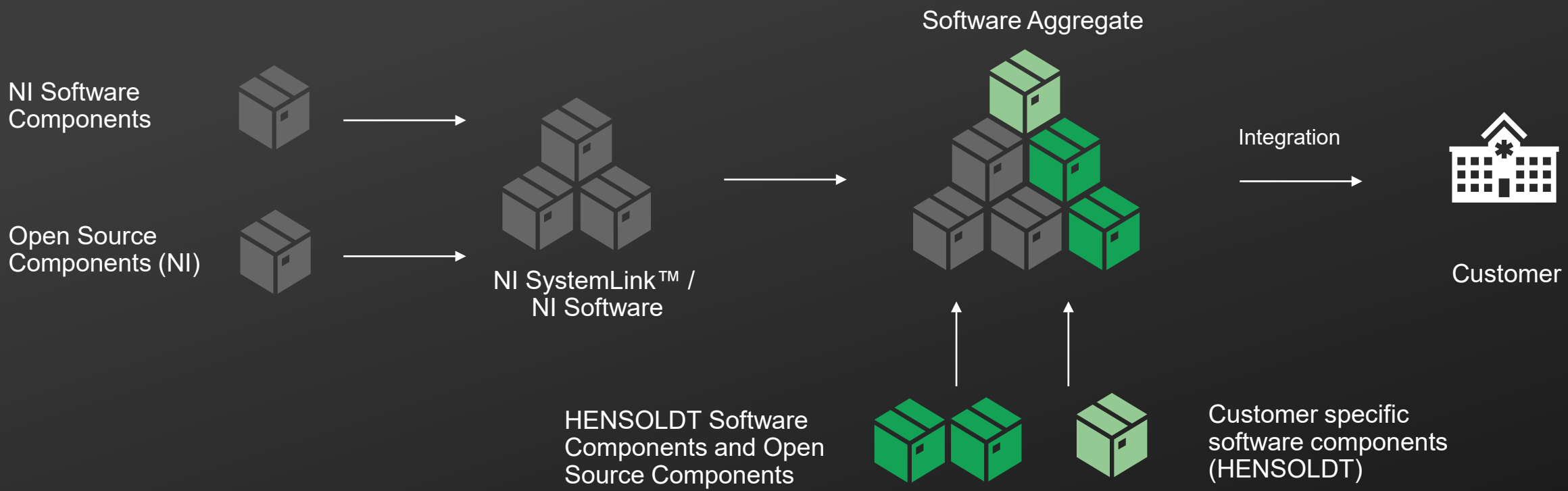
From NI SystemLink™ to DAIMsphere

Extending the COTS base functionality with custom software components



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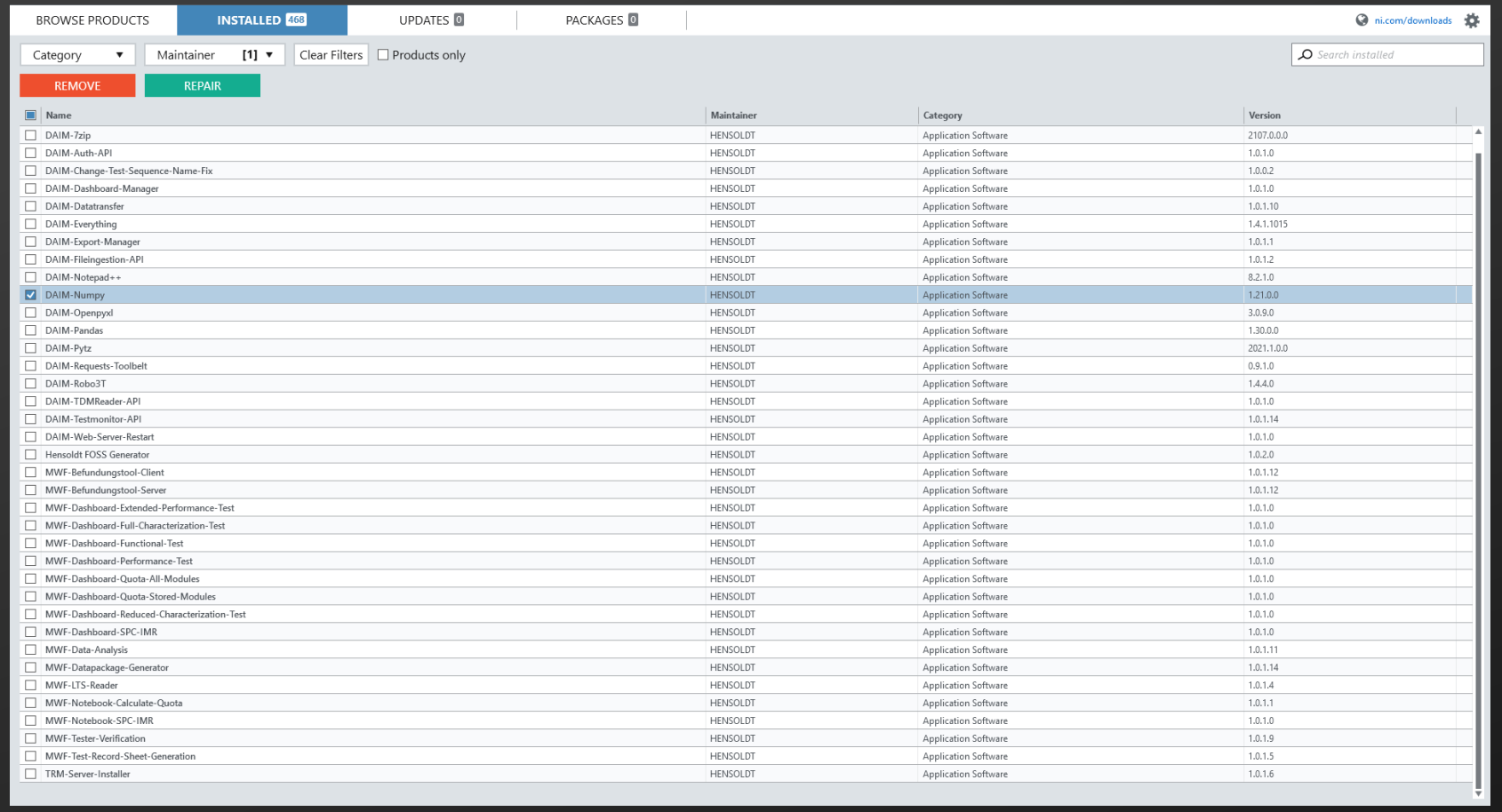
DAIM Package Deployment



Name	Maintainer	Category	Version
DAIM-7zip	HENSOLDT	Application Software	2107.0.0.0
DAIM-Auth-API	HENSOLDT	Application Software	1.0.1.0
DAIM-Change-Test-Sequence-Name-Fix	HENSOLDT	Application Software	1.0.0.2
DAIM-Dashboard-Manager	HENSOLDT	Application Software	1.0.1.0
DAIM-Datatransfer	HENSOLDT	Application Software	1.0.1.10
DAIM-Everything	HENSOLDT	Application Software	1.4.1.1015
DAIM-Export-Manager	HENSOLDT	Application Software	1.0.1.1
DAIM-Fileingestion-API	HENSOLDT	Application Software	1.0.1.2
DAIM-Notepad++	HENSOLDT	Application Software	8.2.1.0
DAIM-Numpy	HENSOLDT	Application Software	1.21.0.0
DAIM-Openpyxl	HENSOLDT	Application Software	3.0.9.0
DAIM-Pandas	HENSOLDT	Application Software	1.30.0.0
DAIM-Pytz	HENSOLDT	Application Software	2021.1.0.0
DAIM-Requests-Toolbelt	HENSOLDT	Application Software	0.9.1.0
DAIM-Robo3T	HENSOLDT	Application Software	1.4.4.0
DAIM-TDMReader-API	HENSOLDT	Application Software	1.0.1.0
DAIM-Testmonitor-API	HENSOLDT	Application Software	1.0.1.14
DAIM-Web-Server-Restart	HENSOLDT	Application Software	1.0.1.0
Hensoldt FOSS Generator	HENSOLDT	Application Software	1.0.2.0
MWF-Befundungstool-Client	HENSOLDT	Application Software	1.0.1.12
MWF-Befundungstool-Server	HENSOLDT	Application Software	1.0.1.12
MWF-Dashboard-Extended-Performance-Test	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-Full-Characterization-Test	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-Functional-Test	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-Performance-Test	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-Quota-All-Modules	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-Quota-Stored-Modules	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-Reduced-Characterization-Test	HENSOLDT	Application Software	1.0.1.0
MWF-Dashboard-SPC-IMR	HENSOLDT	Application Software	1.0.1.0
MWF-Data-Analysis	HENSOLDT	Application Software	1.0.1.11
MWF-Datapackage-Generator	HENSOLDT	Application Software	1.0.1.14
MWF-LTS-Reader	HENSOLDT	Application Software	1.0.1.4
MWF-Notebook-Calculate-Quota	HENSOLDT	Application Software	1.0.1.1
MWF-Notebook-SPC-IMR	HENSOLDT	Application Software	1.0.1.0
MWF-Tester-Verification	HENSOLDT	Application Software	1.0.1.9
MWF-Test-Record-Sheet-Generation	HENSOLDT	Application Software	1.0.1.5
TRM-Server-Installer	HENSOLDT	Application Software	1.0.1.6

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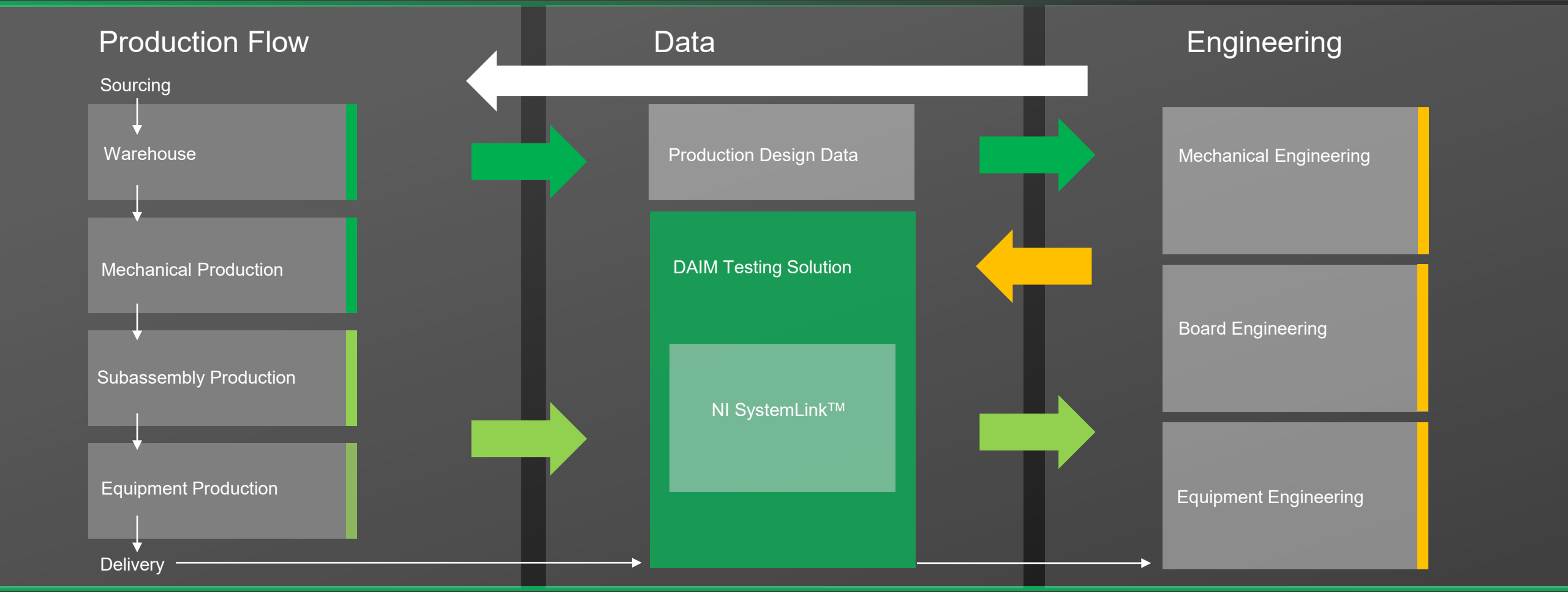
Integration of DAIMsphere within the production stage



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The Data Flow Layers

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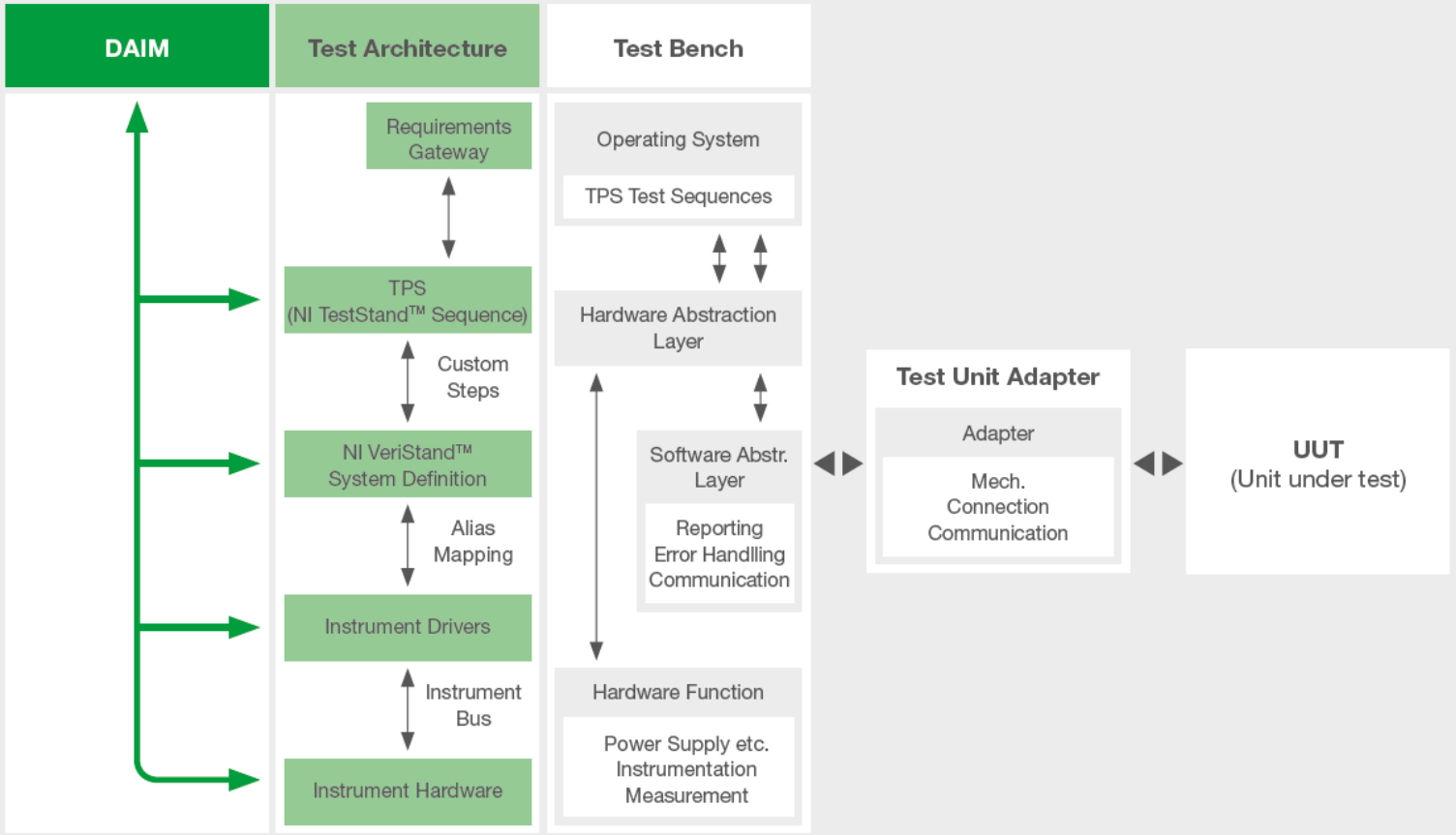
Data Generation: Exemplary @ HENSOLDT

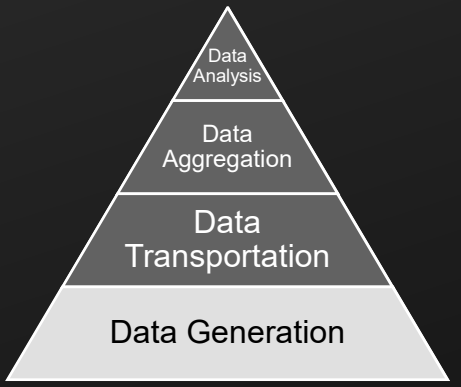
Multiple data sources lead to multiple data formats



- Inhouse developed tester with standard test framework TAC (Test Automation Center)
- Legacy Tester
- Test systems developed from other companies and integrated in production landscape

  → Multiple file formats

  → Multiple report formats



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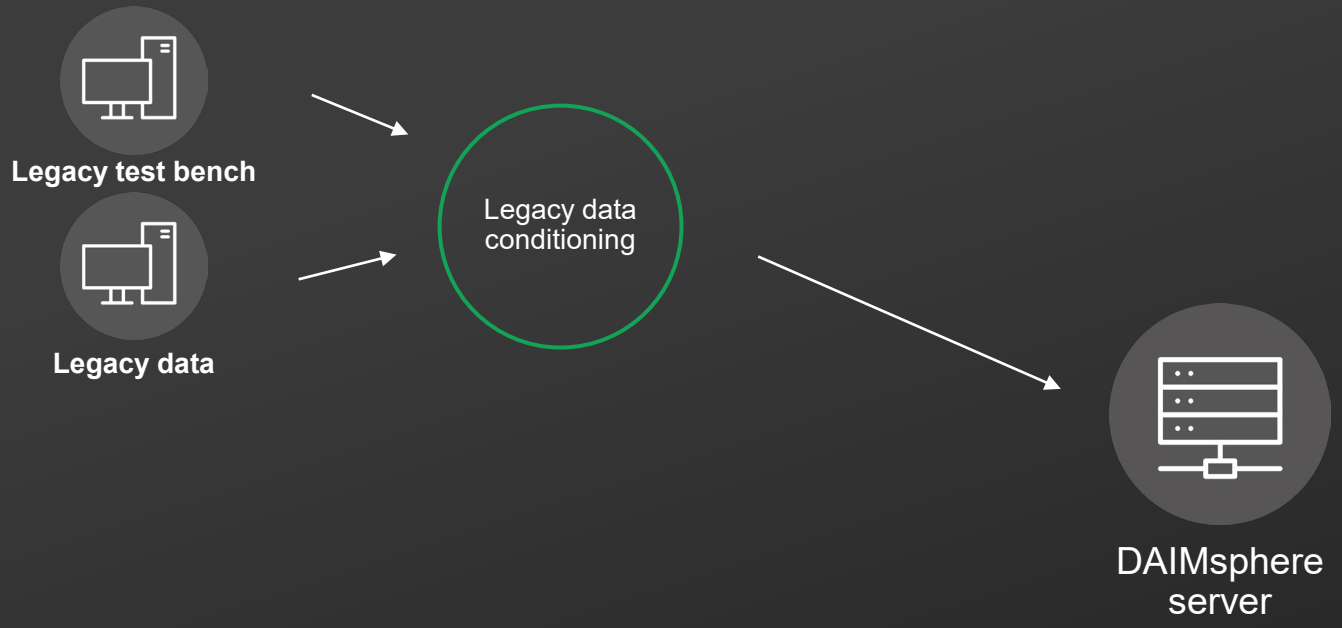
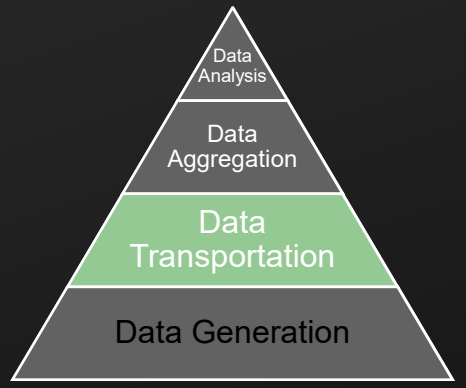
Data Transportation

Infrastructure to collect data from multiple sources



Data Transportation includes:

- Tools to collect asset and configuration relevant data on data generation level
- Connection to the DAIMsphere server
- Infrastructure to facilitate the transfer of data from data source to the server in areas without direct network access or sensitive data handling areas including export, sanitization and upload tools



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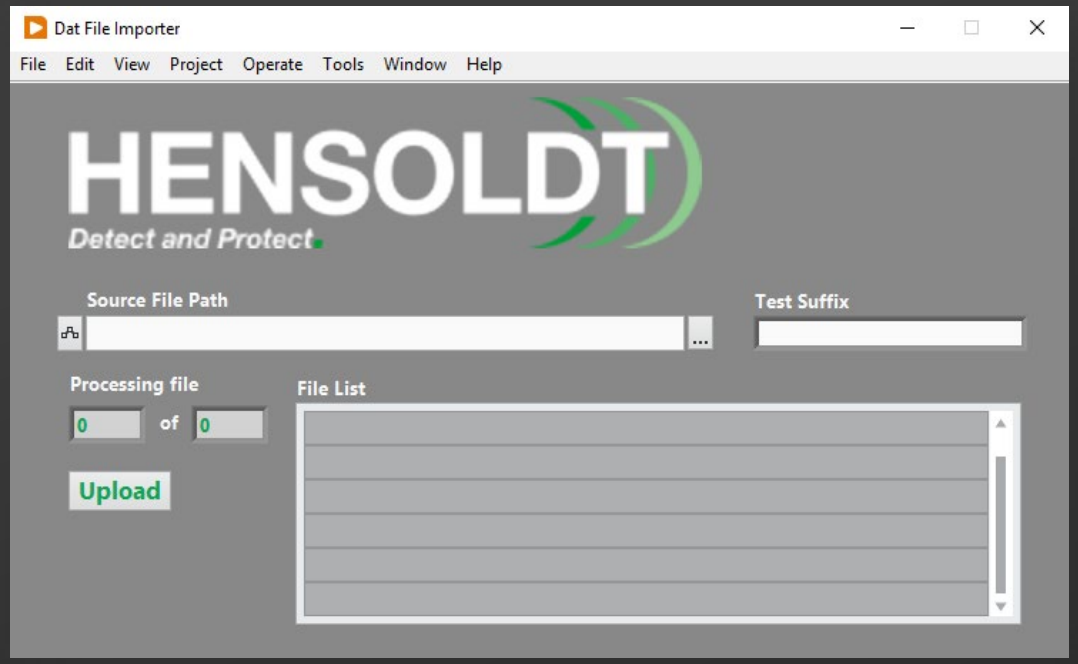
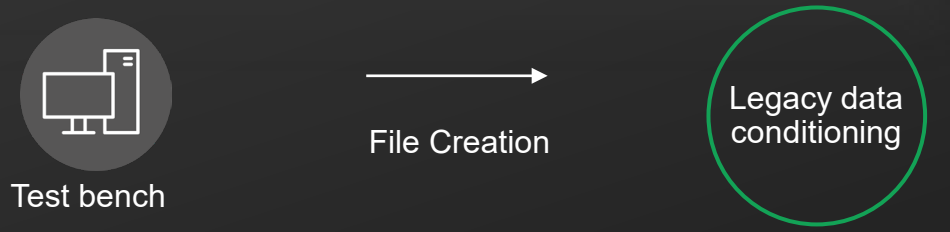
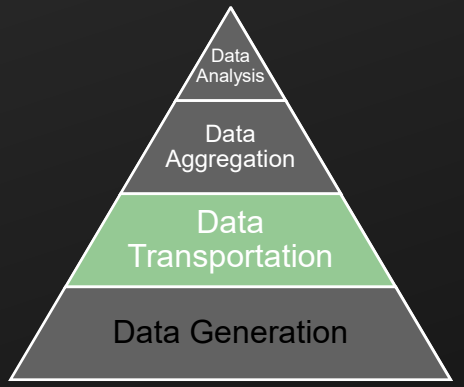
Data Transportation: Legacy data conditioning tool

Example: .dat file conversion and server upload @ HENSOLDT



- .dat files are a legacy file format used @ HENSOLDT
- Test data is parsed and uploaded using the REST API interface
- Test data is in a standardized and correlating format





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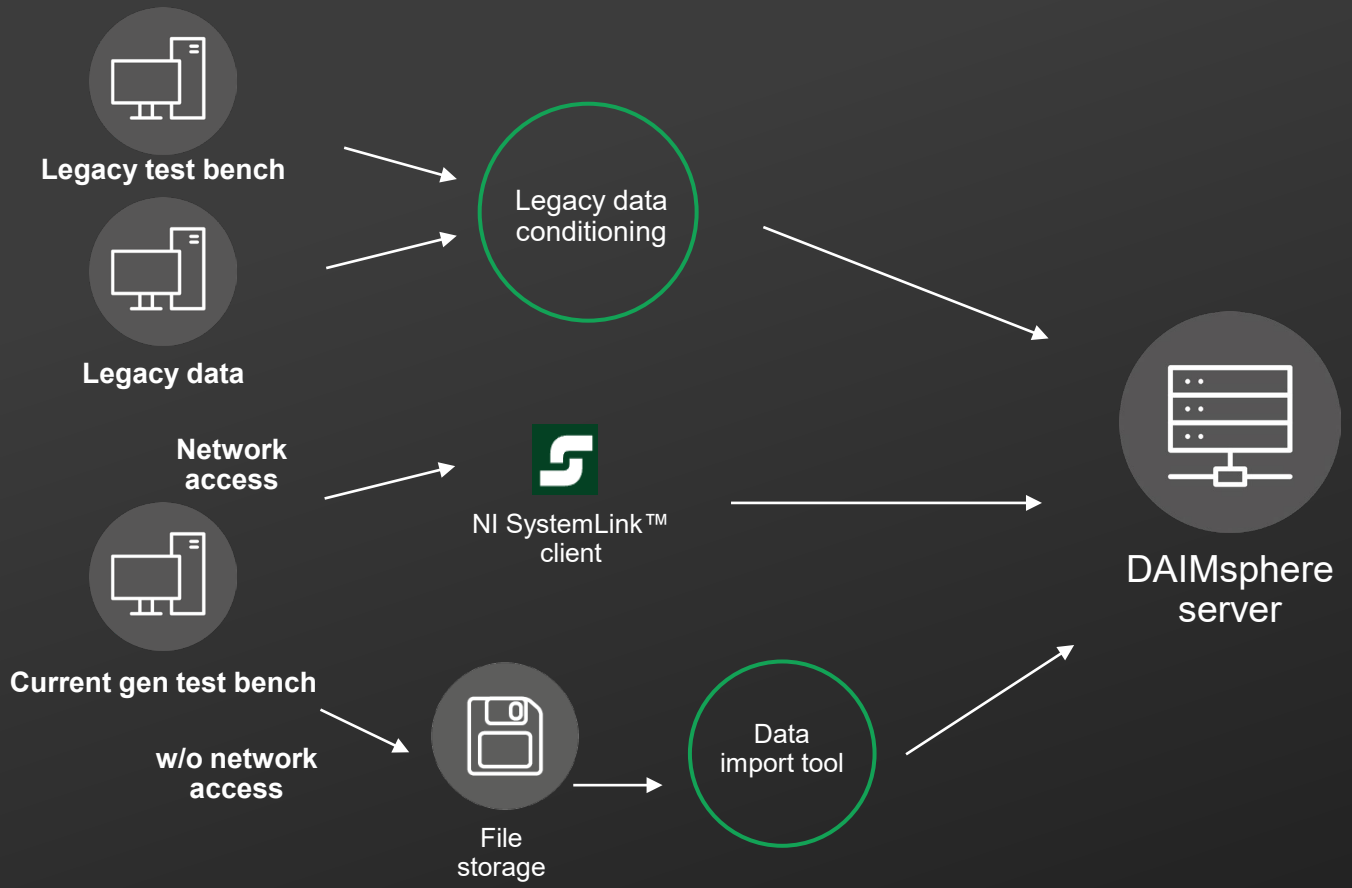
Data Transportation

Infrastructure to collect data from multiple sources



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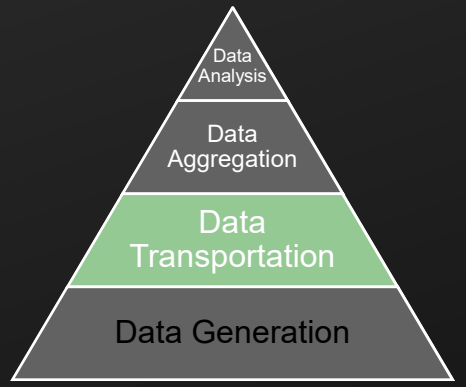

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Live Demonstration – Data Transportation

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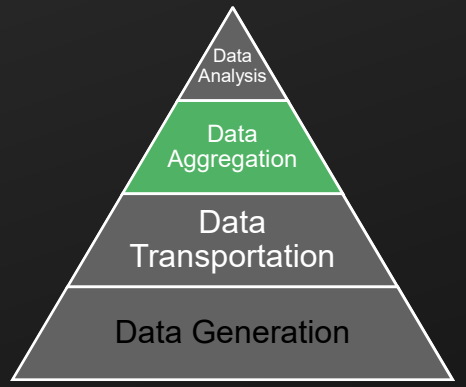
Data Aggregation

Creation of a centralized secure test data infrastructure

- Precondition to enable data correlation
- Traceability of test system configurations
- Data correlation feasibly across multiple product hierarchies
- Separation of data into workspaces with role based access and rights management to be compliant with the need to know principle
- Asset management



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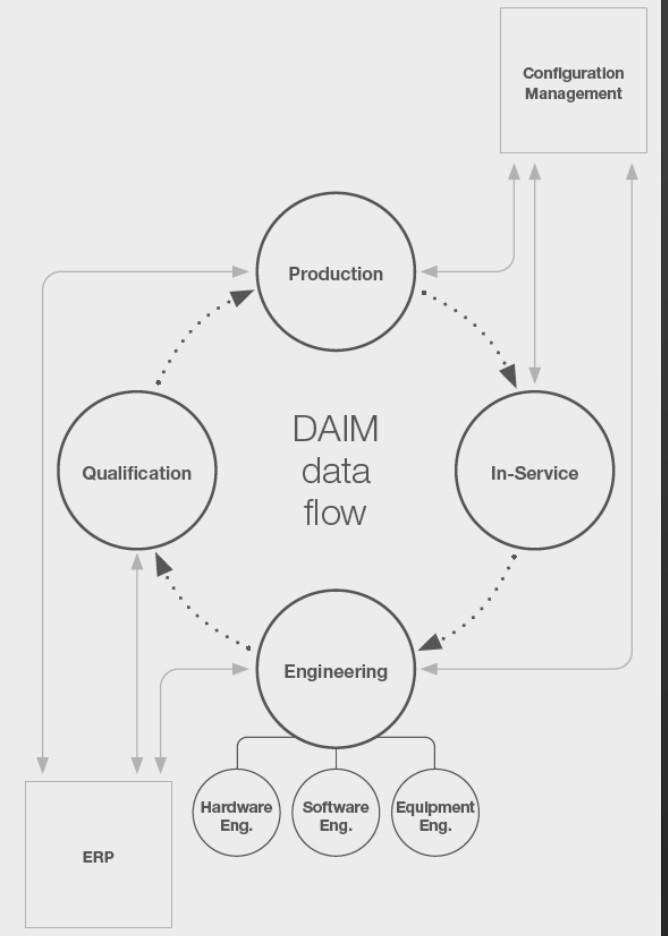
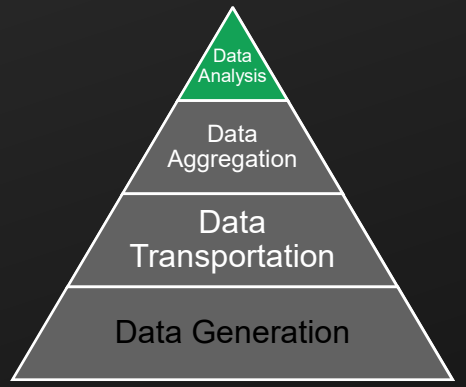
Data Analysis

Real data driven decisions



- Custom analysis routines covering the entire data lifecycle
- Instantaneous automated analysis e.g. automated tester verification, limit verification & detection of failure clusters
- Real-time monitoring and reporting of test data
- Statistical verification of testing parameters during production ramp up using limit simulation
- Monitoring of process stability (SPC)
- Support in planning obsolescence removal



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Live Demonstration – Data Analysis

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Real Data

Example 1 for Limit Prediction

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Real Data

Example 2 for Limit Prediction

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Real Data

Example 3 for Limit Prediction

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DAIMsphere: The Value Proposition

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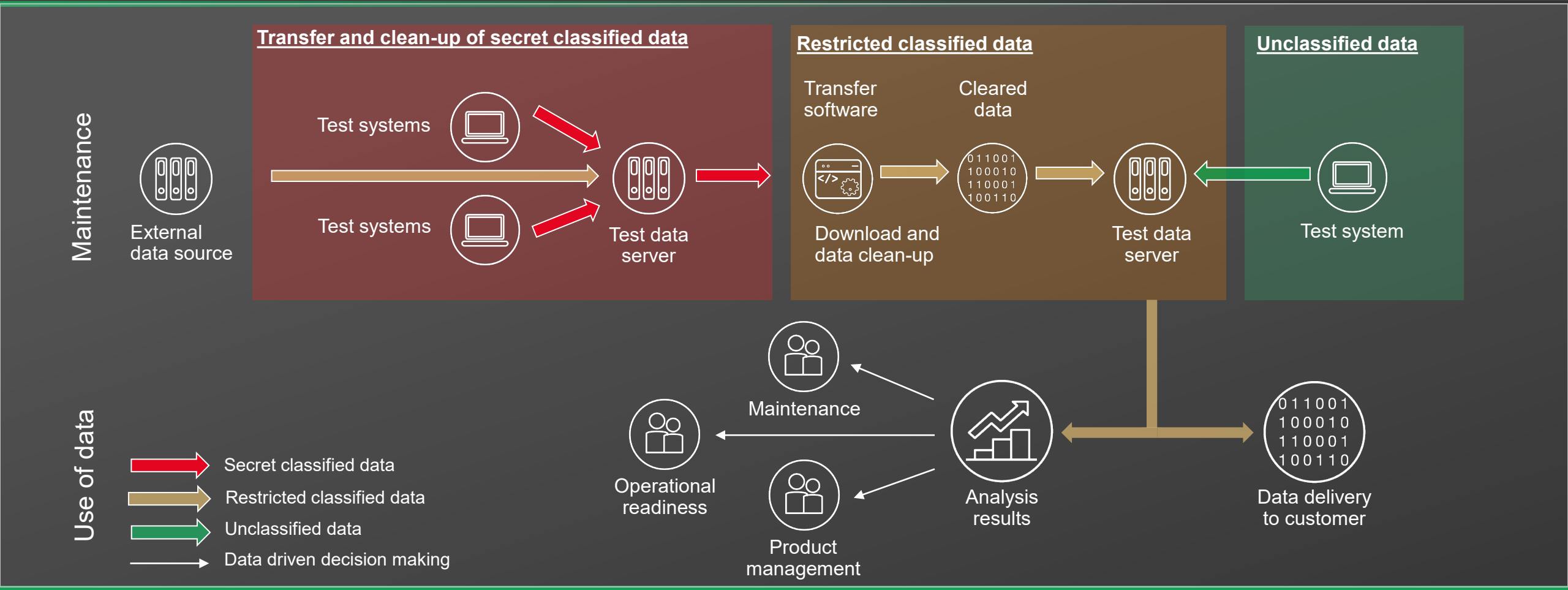
Test Data Management along the Product Life Cycle

Provision and interpretation of data across departments and security levels



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Live Demonstration – Data Transfer between Security Levels

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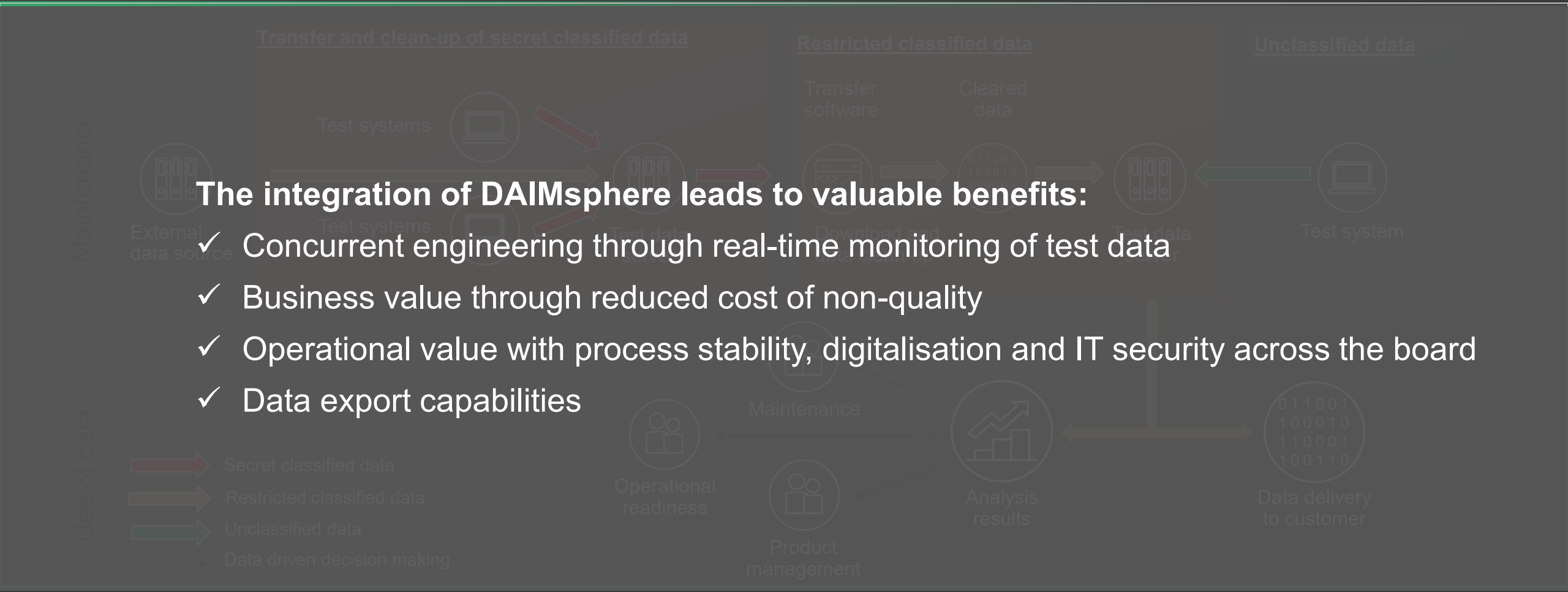
Test Data Management along the Product Life Cycle

Provision and interpretation of data across departments and security levels



The integration of DAIMsphere leads to valuable benefits:

- ✓ Concurrent engineering through real-time monitoring of test data
- ✓ Business value through reduced cost of non-quality
- ✓ Operational value with process stability, digitalisation and IT security across the board
- ✓ Data export capabilities

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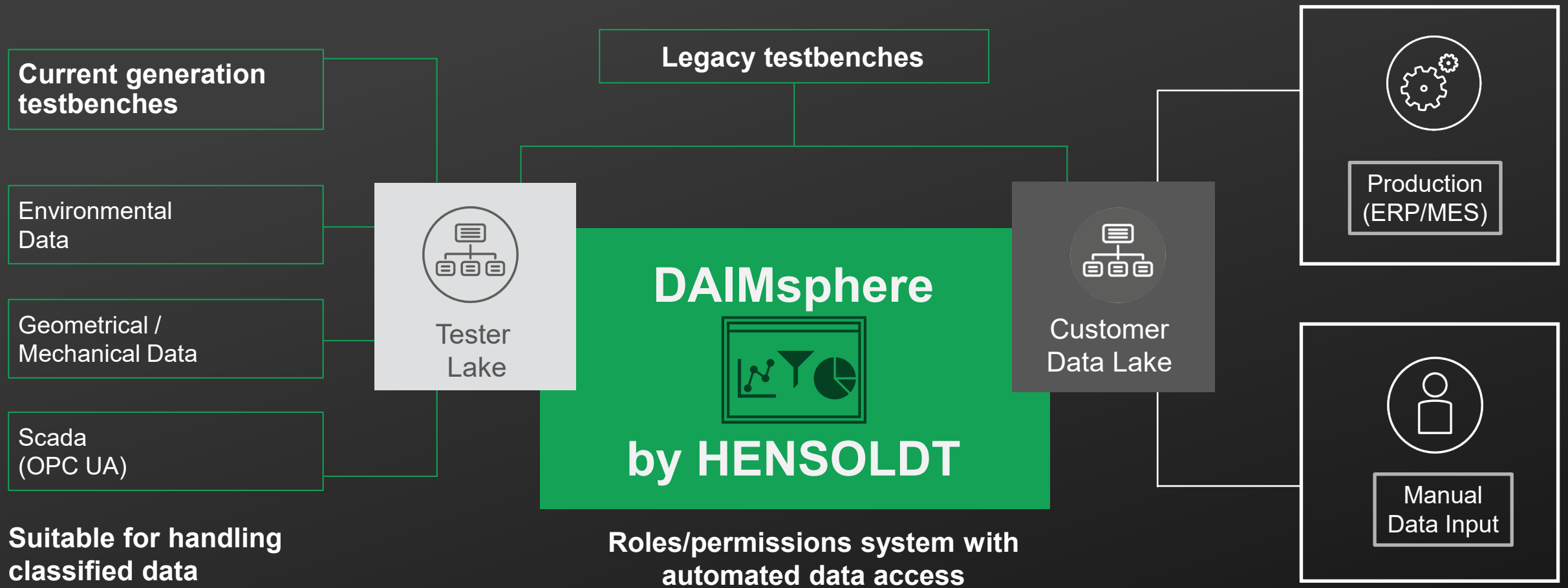
DAIMsphere for Testing Solutions

A commercially available IIoT solution based on SystemLink™



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Thank you for your interest!

For more information please feel to contact:

services@hensoldt.net

https://www.hensoldt.net/services/special-services/testing-solutions/

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