PROJECT of the PEGASUS FAMILY

VERIFICATION VALIDATION METHODS

Mid-Term Presentation 15 / 16 March 2022

Dataflow in the VVM Project

Nicolas Wagener, RWTH Aachen University

Kevin Laubis, AVL Deutschland GmbH

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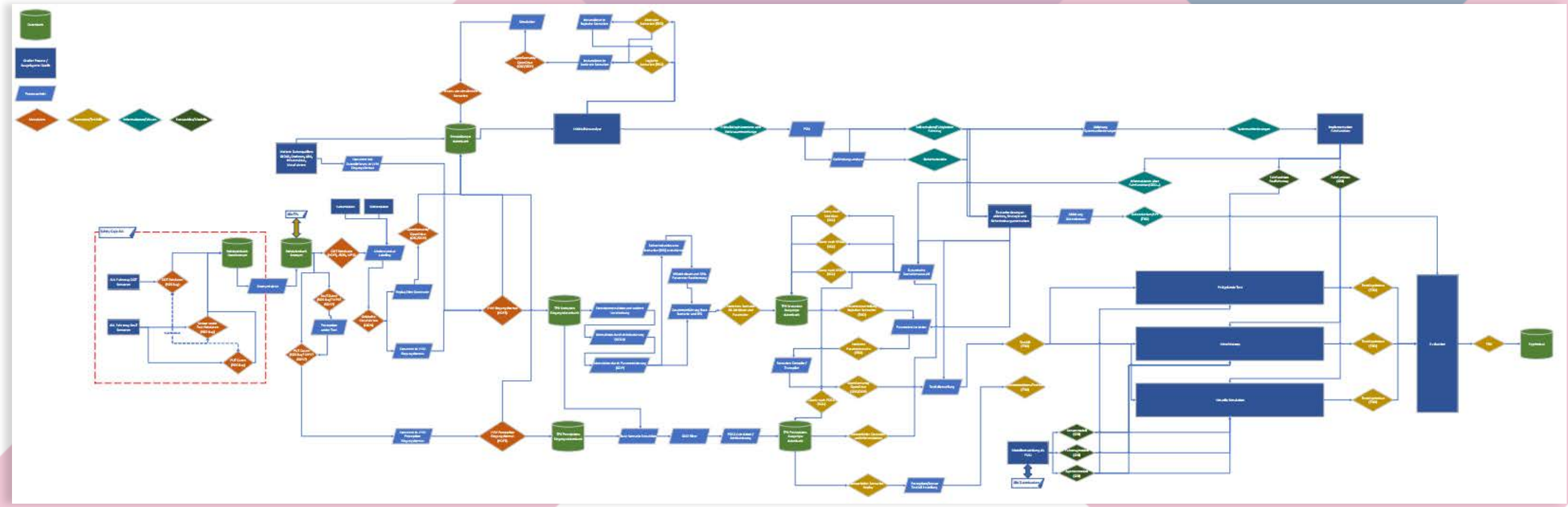
on the basis of a decision by the German Bundestag

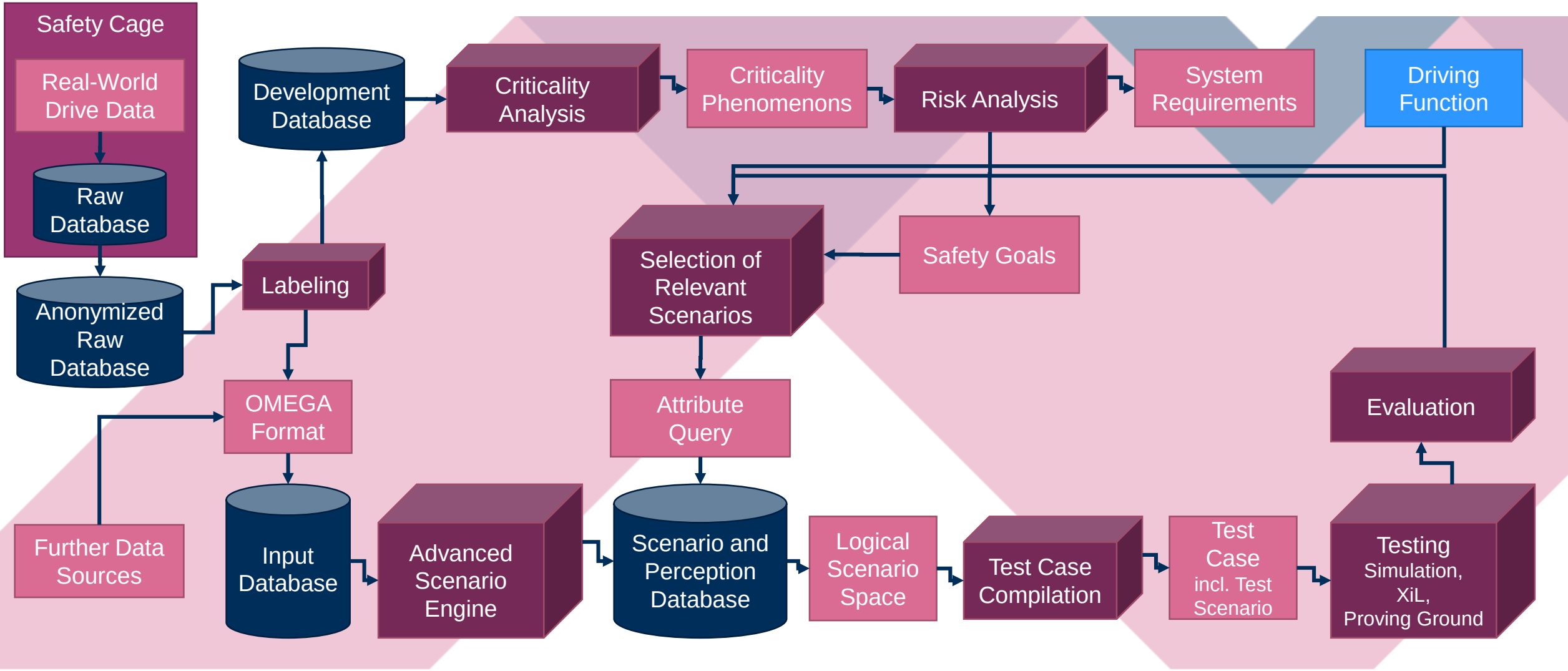
Agenda

- Data Flow Overview
- Data Capturing
- Databases
  - Raw Database
  - Scenario Database
  - Perception Database
  - Development Database

Data Flow Overview



Data Flow Simplified



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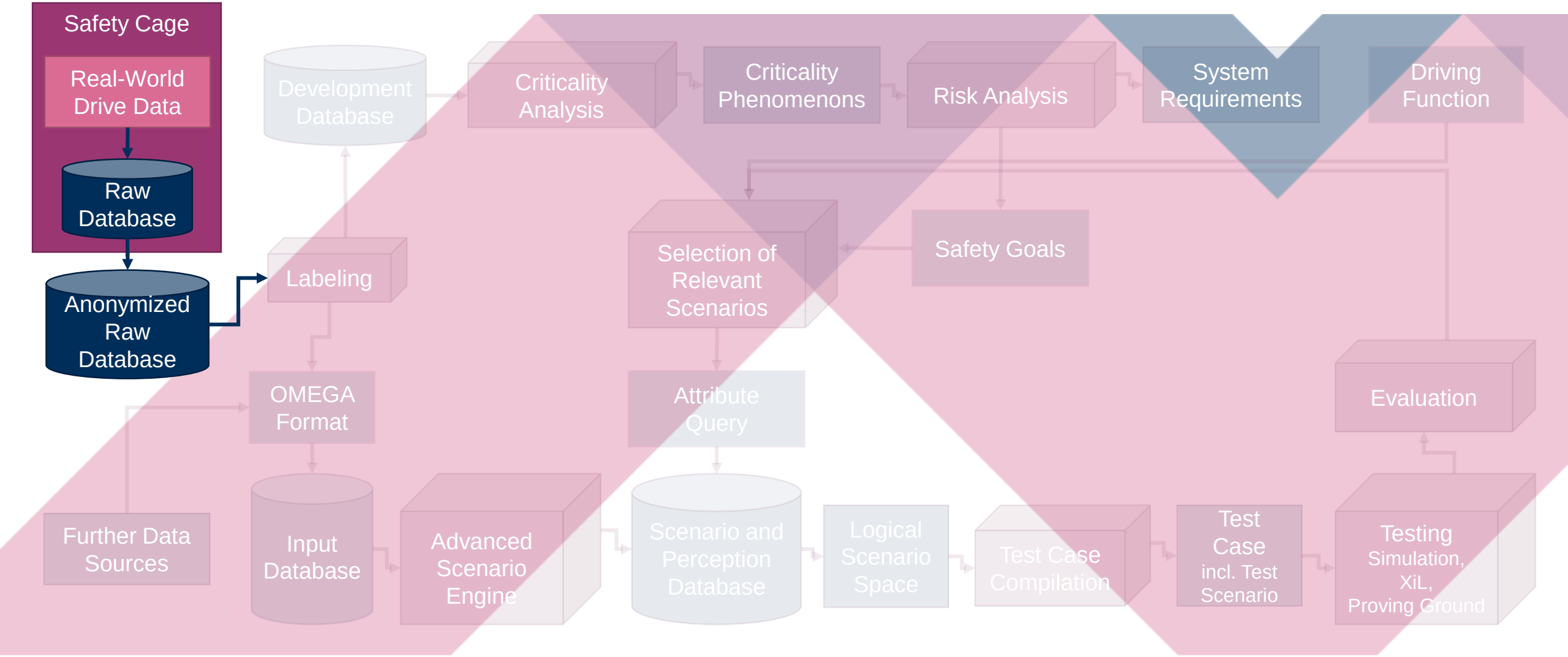


Data Capturing Vehicle

Parallel capturing of …

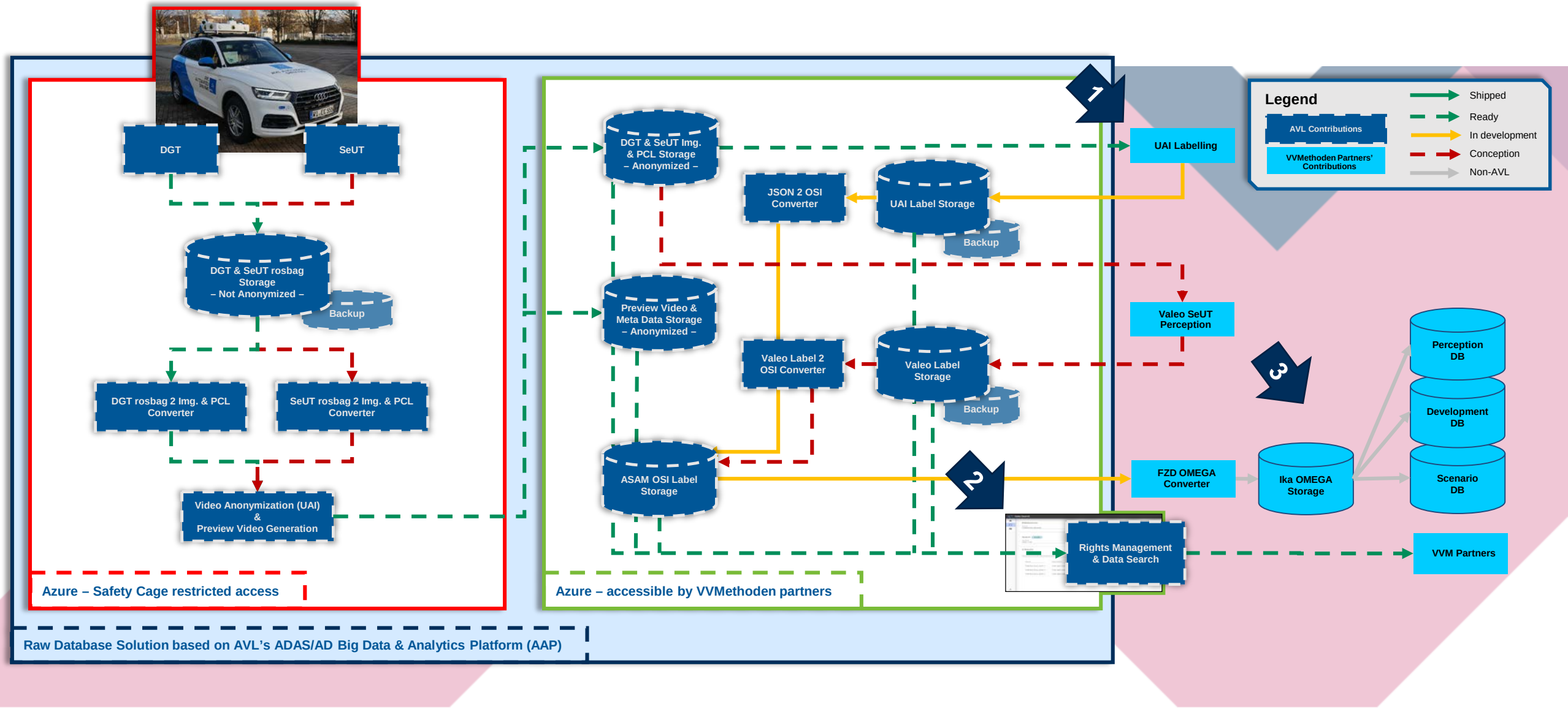
… **Dynamic Ground Truth (DGT)**

Reference sensor system on the roof rack

… **Sensor under Test (SeUT)**

Extended sensor suite in the vehicle

Raw Database Solution – Architecture



Raw Database Solution – Rights Management

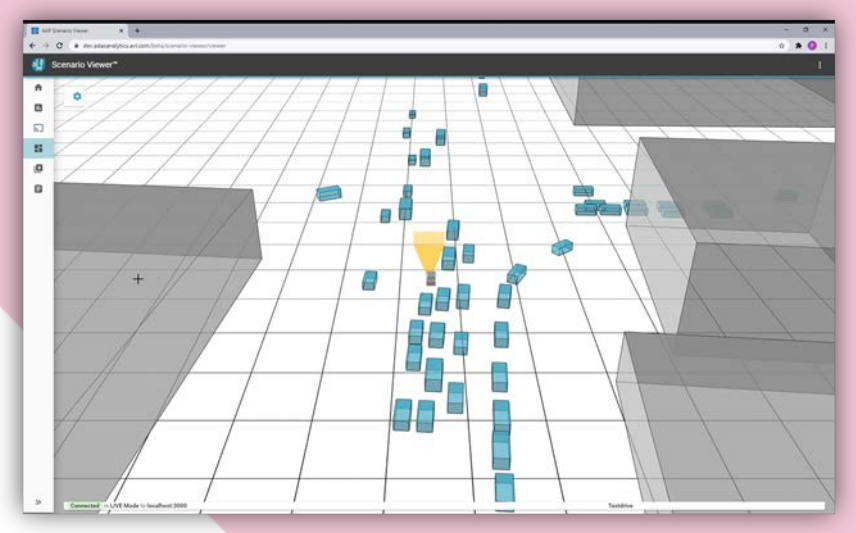
Use case diagram

Raw Database Solution – Labeling Interface

- Anonymized raw **data can be accessed by UAI**, and labels can be returned
- SAS tokens have been provided to automate **access via REST API**
- **Format alignments** are about to be finalized
- First labeling tests produce **promising results**

Anonymized camera images (and point clouds)
(pulled from raw database by UAI)

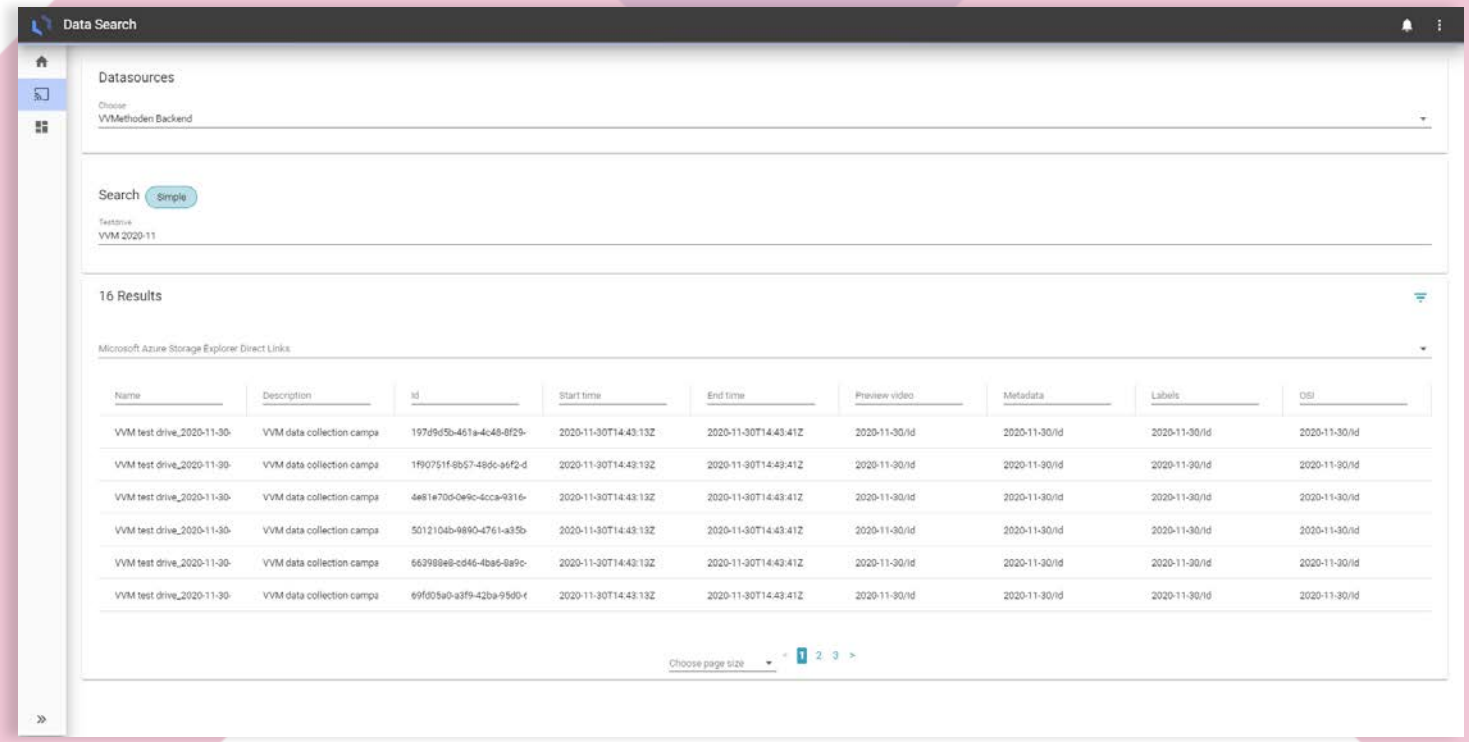
Labeling by UAI



Object lists
(pushed to raw database by UAI)

Raw Database Solution – Data Search Demo

- Unique access to **all raw data related to a test drive** (meta data, preview videos, labels, OSI files)
- **Filtering** of the trips using tags
- Realization of **access rights**



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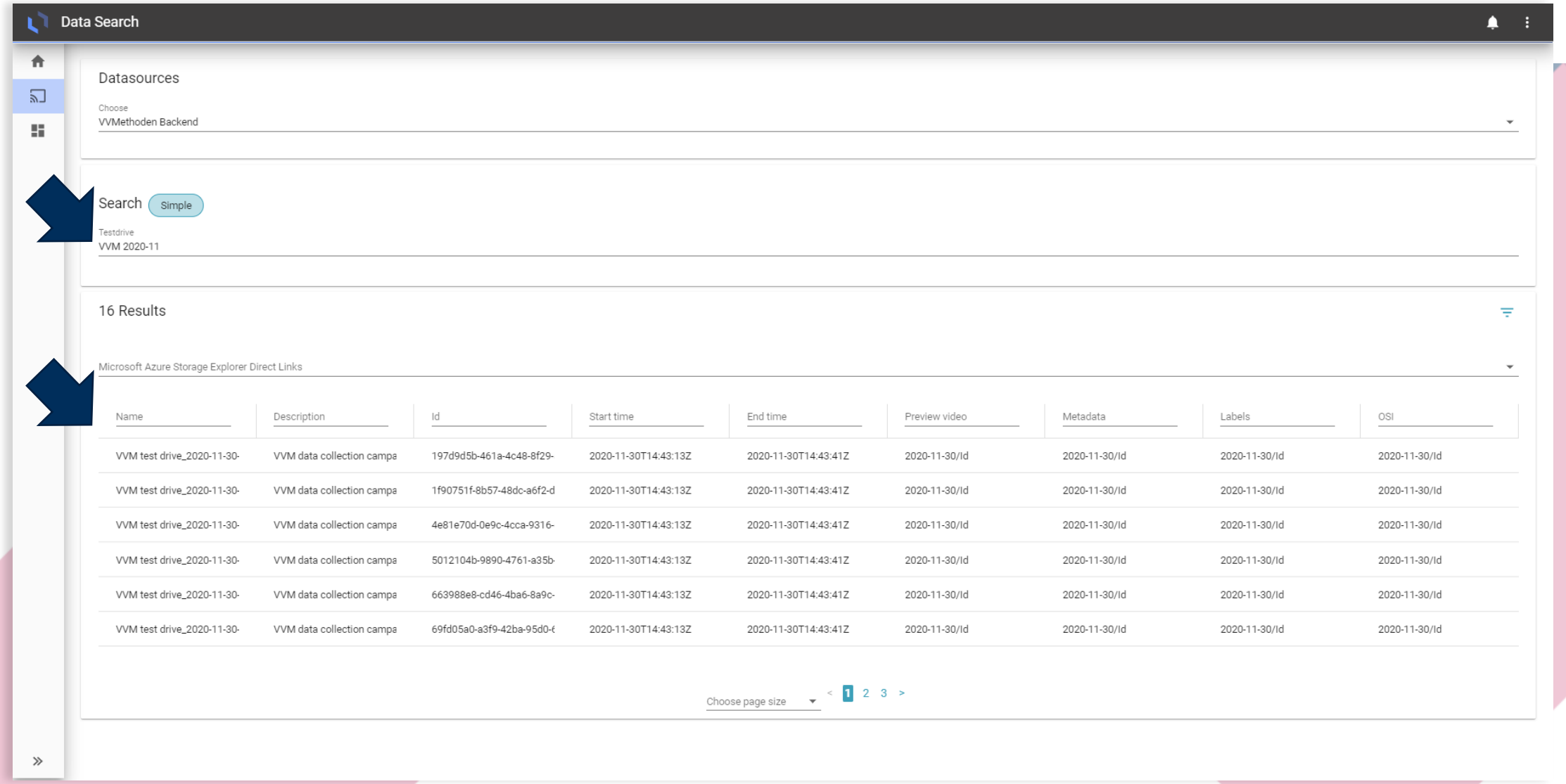

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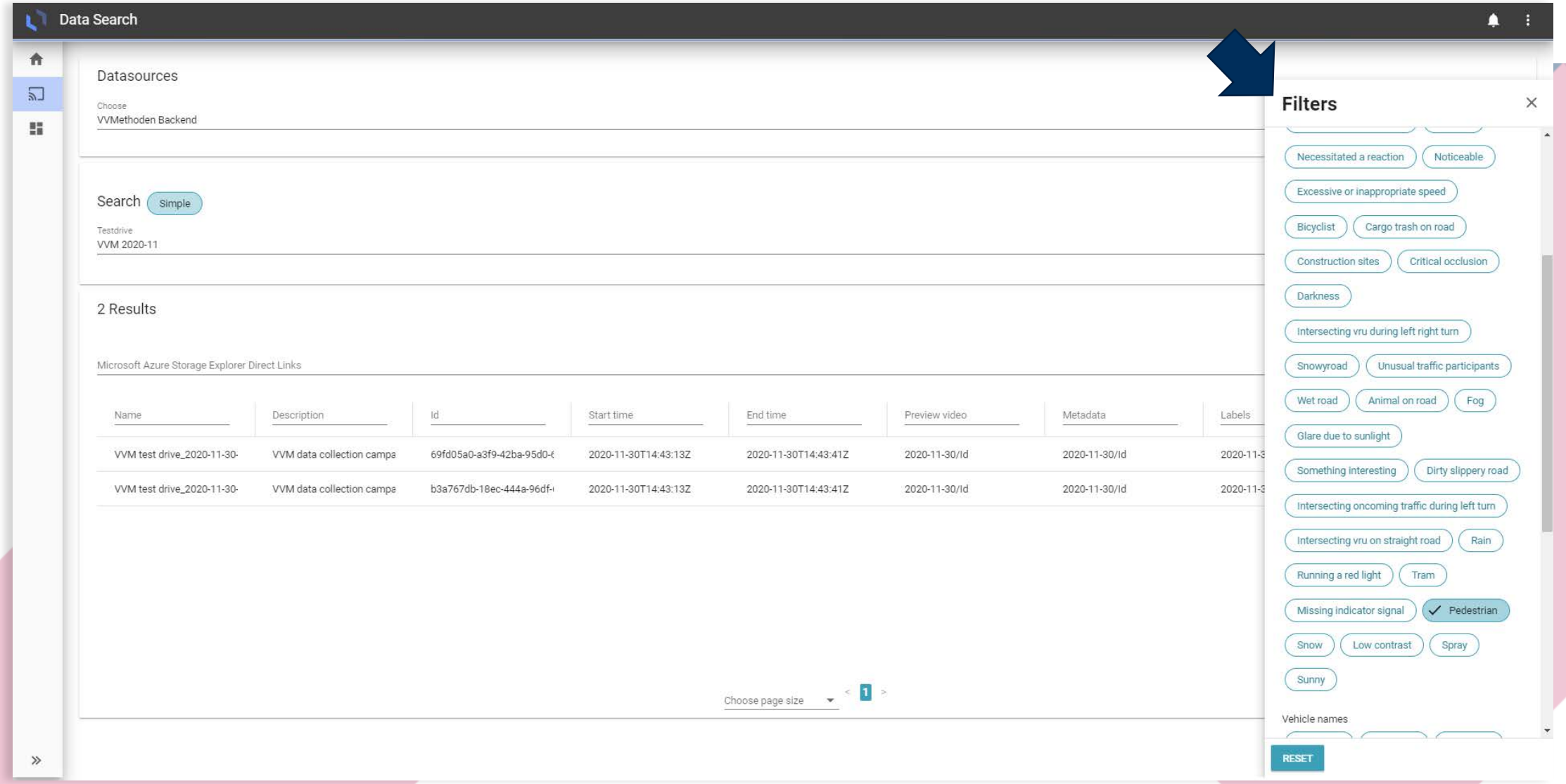

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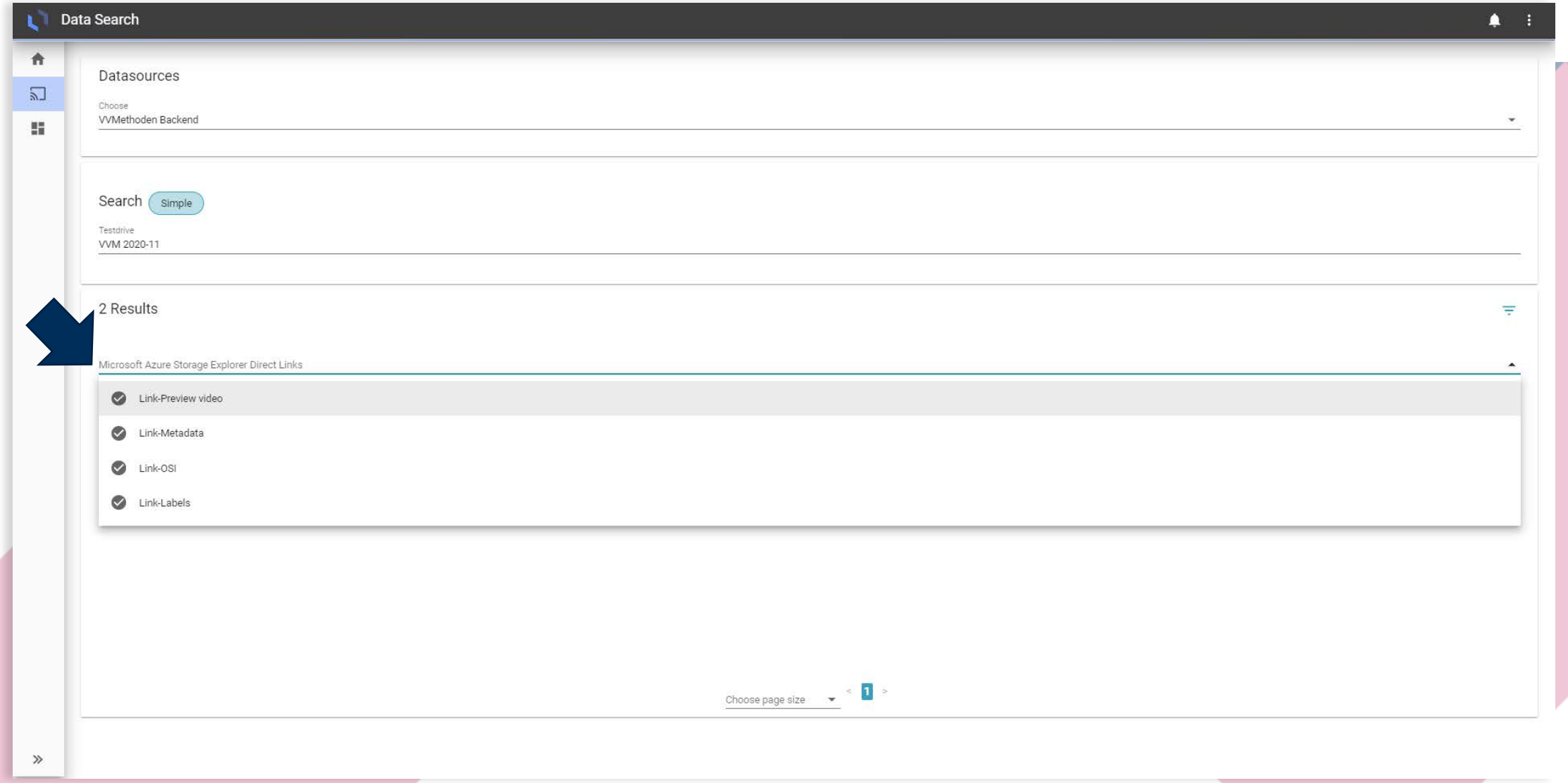

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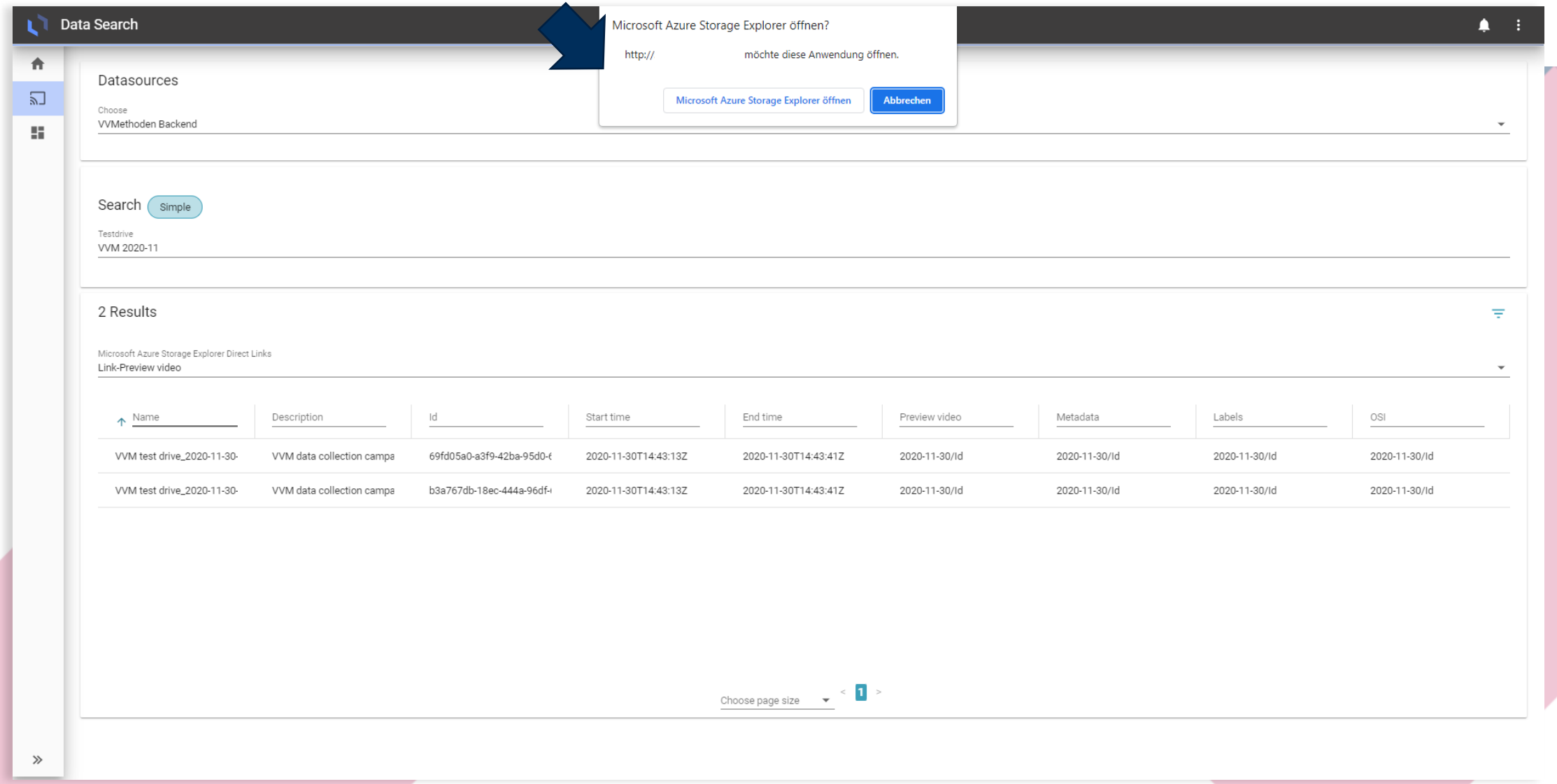

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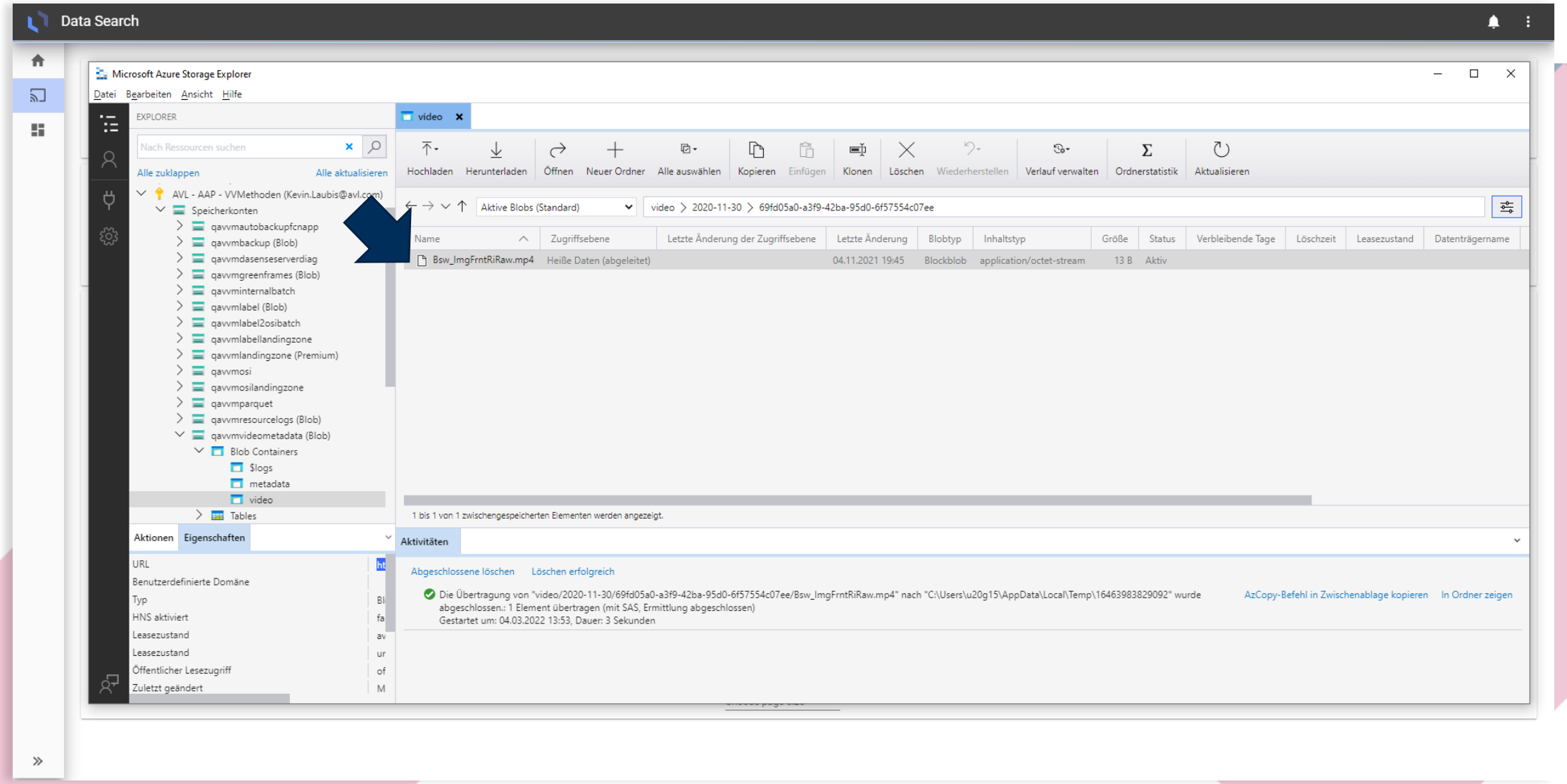

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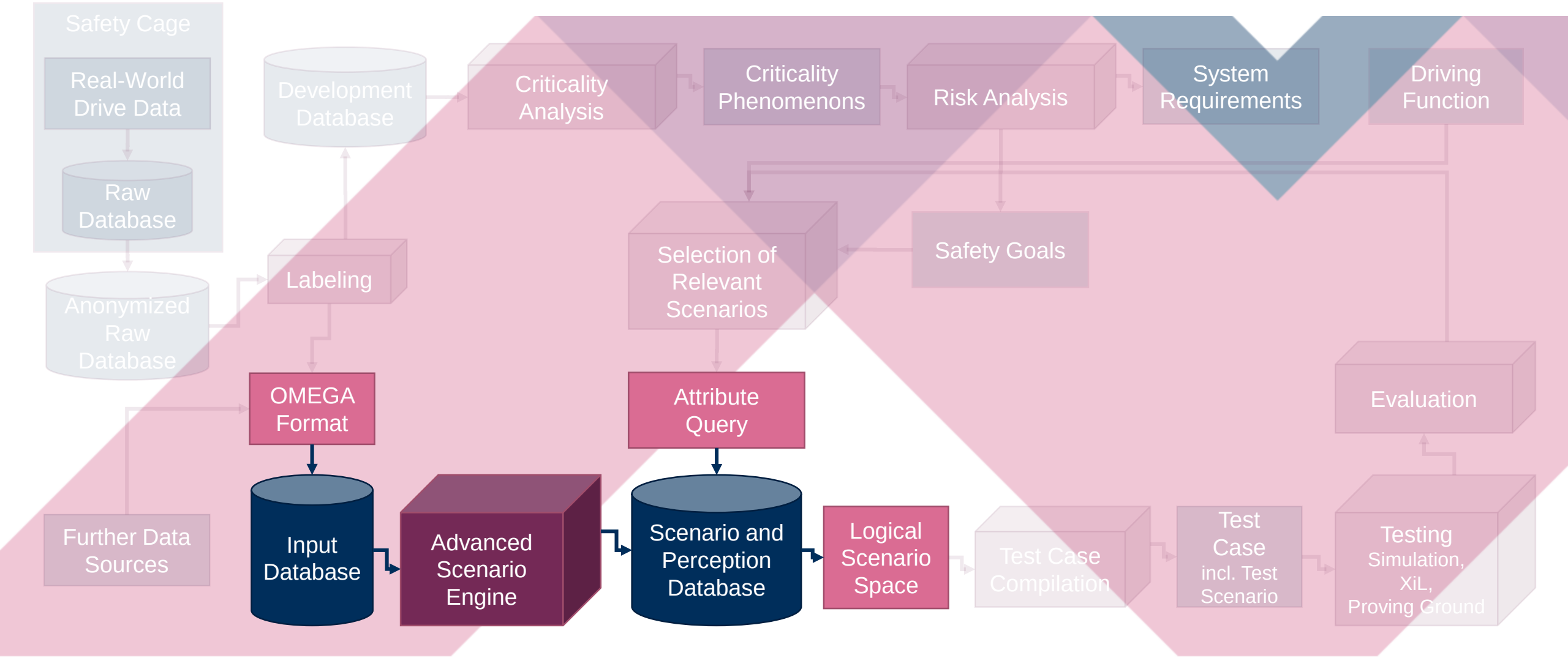
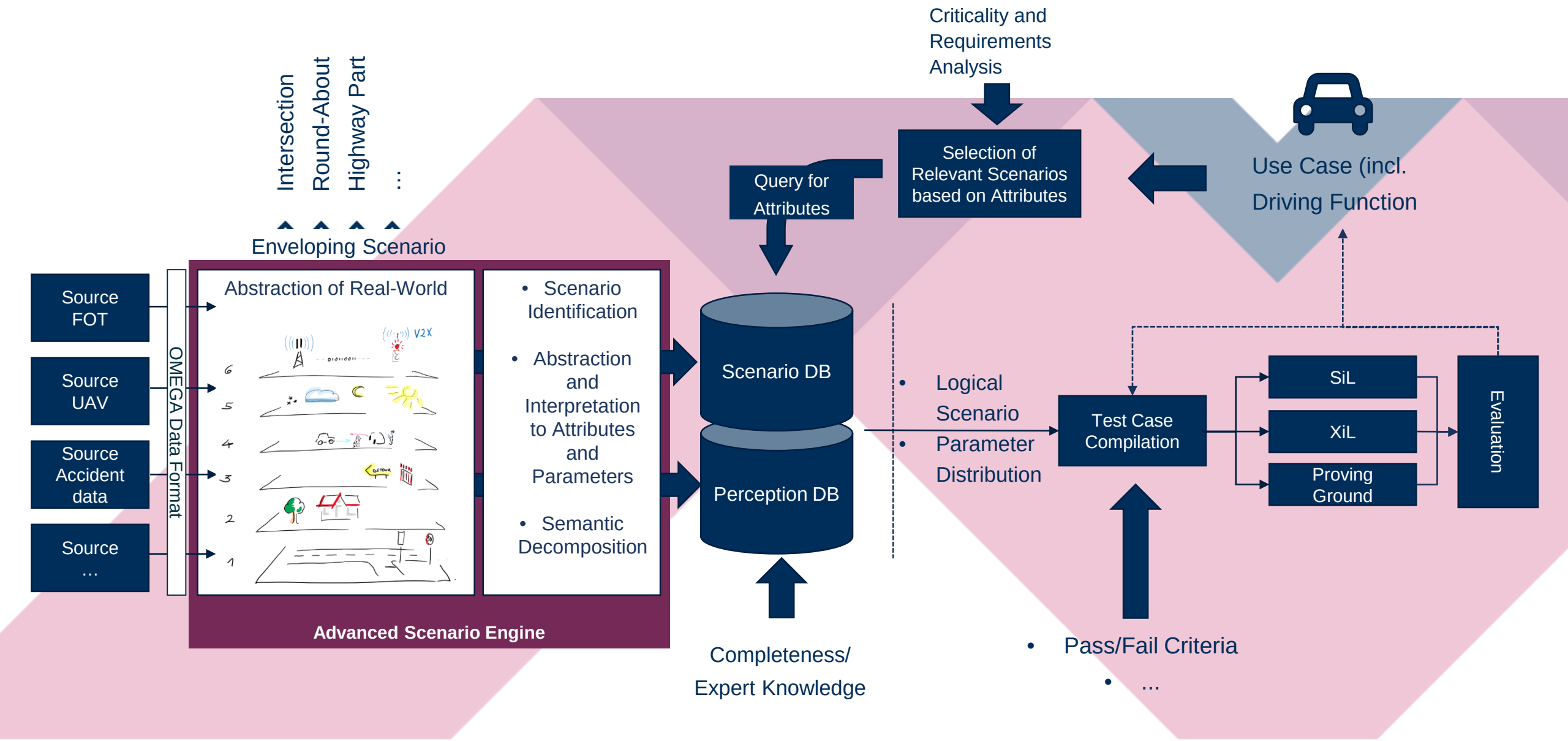
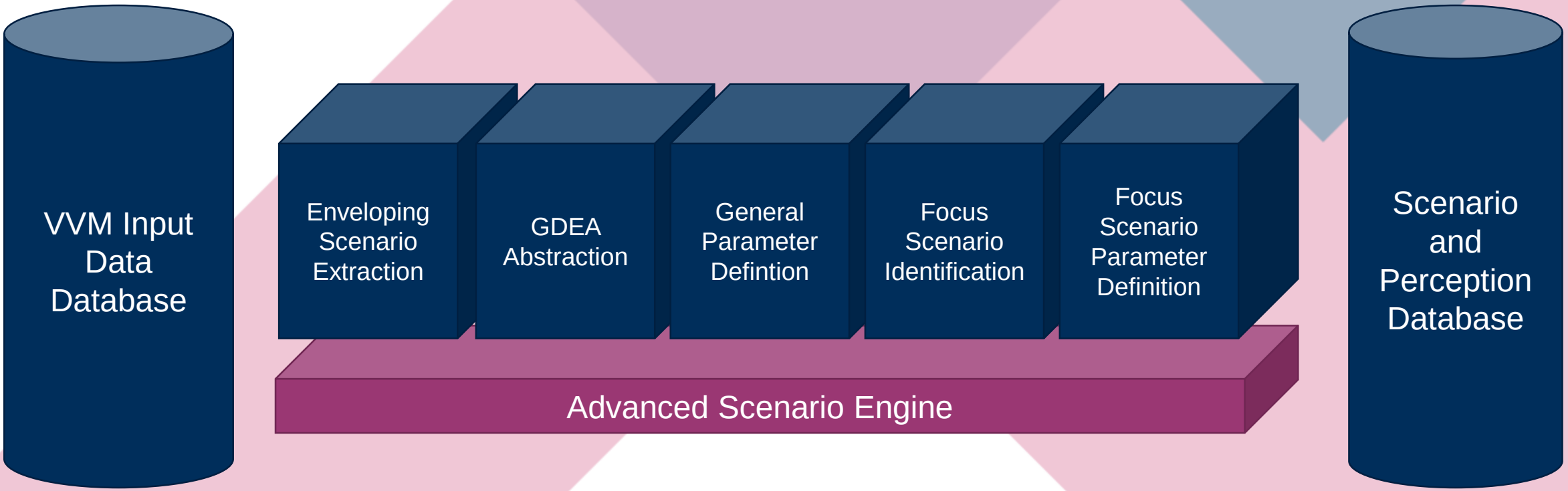


Context of the Advanced Scenario Engine in VVM

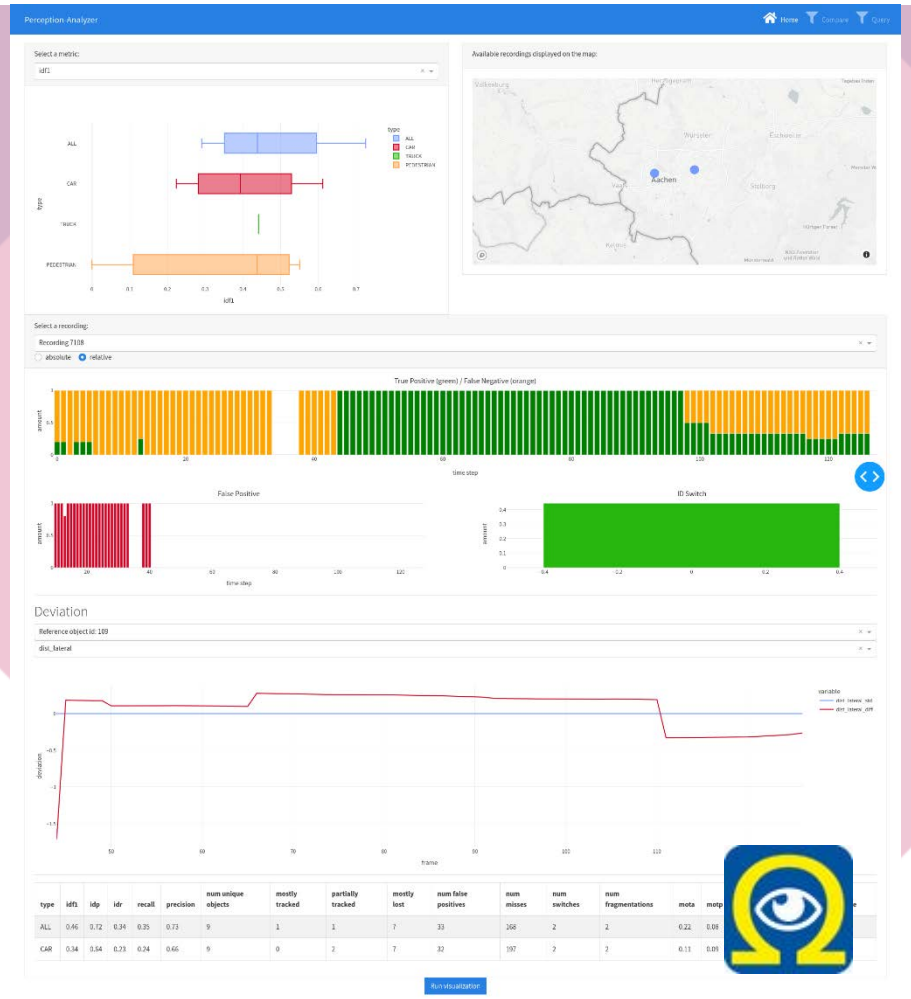


Advanced Scenario Engine



Perception Database

- Perception Data-Format tied to Omega Format
  - Easy interoperability
  - Object-list-based
- Analyze Sensor and Perception failures
  - Synergy with Scenario Database
- Many Precalculated Perception Metrics
  - Detection
  - Tracking
- Web interface for data exploration



Upload Interface to AES

- OpenAPI
  - Free Code Generation for any Programming Language
- User Management
- Upload → Update → Automated Extraction

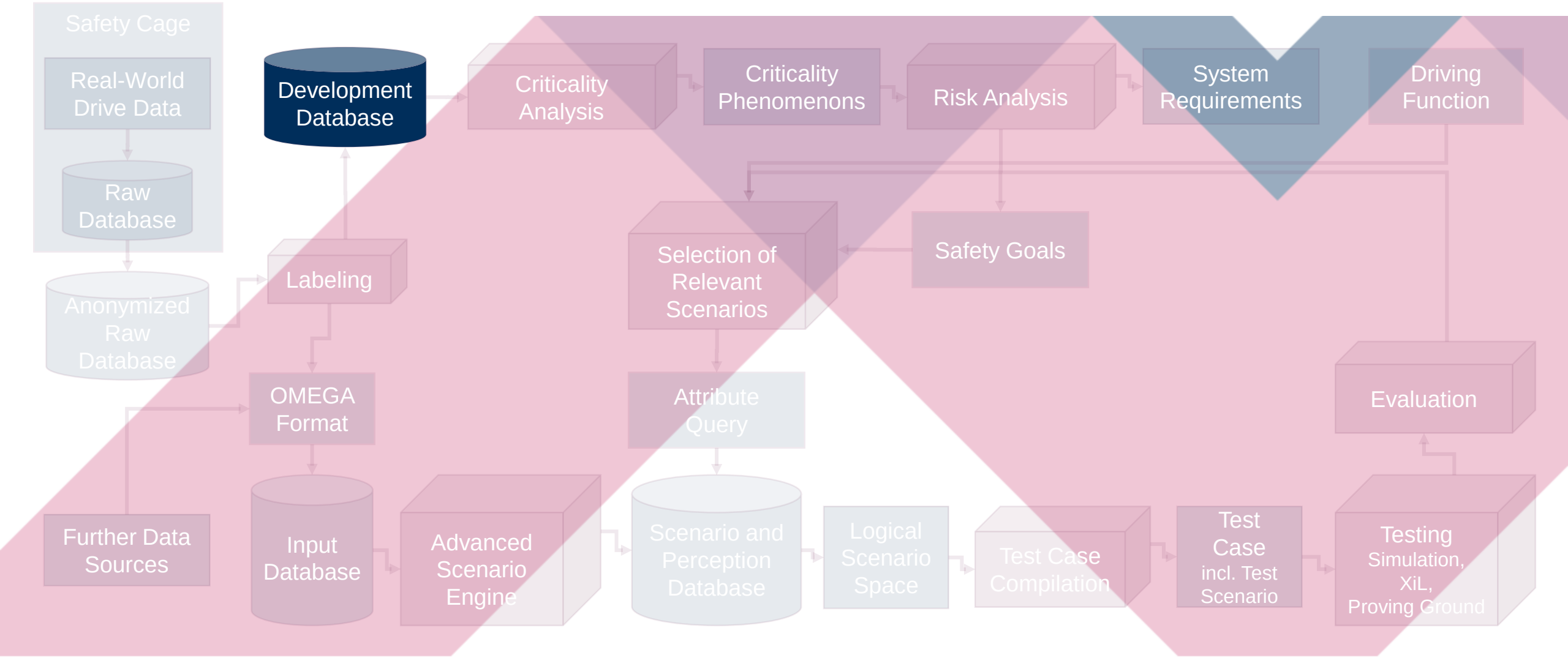
captures

GET	/api/v1/captures/list	List Captures
GET	/api/v1/captures	Get Capture
POST	/api/v1/captures	Upload Capture
PATCH	/api/v1/captures	Update Captures Info
POST	/api/v1/captures/reference	Upload Reference
PATCH	/api/v1/captures/reference	Add Reference
PATCH	/api/v1/captures/perception	Add Perception
PATCH	/api/v1/captures/video	Add Video

me

GET	/api/v1/me	Get Me
DELETE	/api/v1/me	Delete Me
PATCH	/api/v1/me	Change Me
POST	/api/v1/me/activate	Activate Me

Data Flow Simplified



Development Database

- Collaborative Scientific Integration Environment
- FDM Integrationsystem
  - WebS3, GitLab, Archive
  - Web Interface with DFN-AAI Sign-On
- Support for FDM Basis-Processes
  - Project and Member Administration
  - Flexible Metadatascheme
  - Source Independent Search
- Organisationstructure and Access Schemes
  - Adminstrators, Managers, Researchers
- Open-Source Platform
  - Central Host

VERIFICATION
VALIDATION
METHODS

Thank you!

Nicolas Wagener | RWTH Aachen University | wagener@ika.rwth-aachen.de

Kevin Laubis | AVL Deutschland GmbH | kevin.laubis@avl.com

PROJECT of the PEGASUS FAMILY

A project developed by the
VDA Leitinitiative
autonomous and connected driving

Supported by:

Federal Ministry
for Economic Affairs
and Climate Action

on the basis of a decision
by the German Bundestag