The MDM (Measurement Data Management) system environment
Audi fast facts

- Brands: Audi and Lamborghini
- 964,151 premium cars delivered to customers 2007
- € 33,600,000,000 turnover 2007
- 53,347 employees worldwide
Overview

- Audi's test environment
- Measurement data management – what users want - and what's behind
- Declaring basic goals - Choosing basic principles
- Integration of heterogeneous processes with MDM
- MDM – a multi domain approach – what's beyond
- The MDM community
Audi’s R&D test environment

- fuel economy
- vehicle performance
- NVH / acoustics
- electronics / HIL
- safety
- durability
- aerodynamics
- power train test
- ...
The MDM (Measurement Data Management) system environment

Audi's R&D test environment

requirements for data management

- shared format
- shared semantic context
- availability
- safety and security
- manageable
- complete

Business data item

Audi's R&D test environment
Audi's R&D test environment

Requirements to be met by a measurement data management solution

• reusable ASAM ODS application model which fits the needs of several domains
• reusable measurement data management applications
• fast deployment of new systems
• increased robustness of the system
• measurement data management development and operation at minimized effort/costs

The Audi MDM Team was and still is convinced, that these requirements can be met.
Measurement data management – what users want - and what's behind

Test Planner
Test Object Conditioner
Test Conditioner
Test Operator
Data Processor
Data Customer
Methods Planner
Methods Administrator
Test Reviewer
Measurement data management – what users want - and what’s behind
Measurement data management – what users want - and what's behind

- plan..
  - describe test context (unit under test, test equipment, test sequence) and measurement quantities), release test order
- store..
  - coherence with context classification
  - consistence, correctness, completeness
- publish..
  - adjust lifecycle parameters: permissions, ownership, lifetime
- use..
  - search
  - navigate
  - retrieve and process
Measurement data management – what users want - and what's behind

ASAM ODS based data centric approach

ASAM ODS is not only the persistence layer for test data, but
- central conversion platform
- configuration control database
- process control database
- application integration platform (by MDM typing concept)
Declaring basic goals - Choosing principles

MDM toolkit

- generic and complete test context description
- native ASAM ODS standard extensible components architecture
Declaring basic goals - **Choosing principles**

**MDM Application Model**
- MDM Object
- MDM Component
- MDM Framework
- OSGi / CCM
- MDM / ODS Driver
- Backend system drivers
- MDM application model
- generated MDM database scheme
- RDBMS
- ASAM ODS Server / CORBA file server

**MDM System Environment**
- Corporate directories
- File space
- ODS API / AvalonAuth
- MDM Framework / MDM API
Declaring basic goals - **Choosing principles**
Declaring basic goals - Choosing principles

MDM Catalogue

MDM component structures

MDM Templates

MDM Measurements

Component

Attribute definition

Attribute definition

Attribute definition

MDM methods administrator

MDM methods administrator

MDM test planner
Integration of heterogeneous processes with MDM

How to create an MDM solution

- build on MDM base environment
- analyze process and requirements
- design description patterns
- design access rules
- connect applications if necessary
- add convenience components
- plan and deploy commercial components (ASAM ODS server, database server)

… ready!
Integration of heterogeneous processes with MDM

3rd party application integration

May 2008
Integration of heterogeneous processes with MDM

- **FLV**
  - fuel economy and vehicle performance

- **MEDAMAK**
  - NVH data management

- **MDM CMP**
  - component test bed

- **HIL test bed data management**
- **electronics / entertainment**
- **temperature management**
- **...**

Recent MDM projects and future MDM project options

May 2008
MDM – a multi domain approach – what´s beyond

So - what’s MDM?

• a generic application model
• a client application core
• an API
• a set of optional generic software components
• a set of methods for
  • test process mapping
  • application development
  • application integration
  • test data storage organization
  • ASAM ODS database scheme development
MDM – a multi domain approach – what's beyond

aggregation of domain knowledge in the MDM component structures throughout system operation time:

- terminology
- test know how
- statistics

description patterns for measurement context description

Enterprise object description for MDM objects

knowledge management technologies

retrieval of process information

data maintenance
The MDM community

Reuse of the MDM toolkit and methodology by other organizations/companies will result in:

- Higher quality of the MDM applications
- Improvement of the MDM design technologies
- New functions for the MDM applications
- Options for users to choose best-in-class tools
- Ad hoc familiarity with systems of similar look & feel
- Efficient implementation of new system instances
- Establishing ASAM ODS know how at multiple sites
- Promoting ASAM ODS as "first choice" for application suppliers
- Development of companies which can provide MDM based system solutions
The MDM community

- MDM is intended to be a collection of ASAM ODS best practices
  The MDM community maintains this collection

Join us at https://www.mdm-community.org
The MDM community

- Membership is for the staff of companies generating test data

  Service suppliers can gain membership if they provide a reference to a project with a client company with the above characteristics, confirmed by this client company.

- Mutual benefit for the MDM community members

- MDM community web site (launched in autumn 2007)
  - Information resources
  - Community forum
  - Contacts
  - https://www.mdm-community.org

- MDM software interchange
  - Members only, No warranty, Permanent source disclosure
  - Modifications have to be published back on source level
  - See MDM community web site for details

- MDM community local meetings and workshops
  - Held until now by Audi, so far open for registration
Thank you!