ASAM

CASE STUDY

Audi MDM toolkit and the MDM community

"With the MDM strategy Audi can maintain a safe and agile product life cycle. We have the flexibility to apply leading technologies for the development of our premium products, taking control of the costs for the system environment at the same time."

Dr. U. Knaust
Audi Research and Development
Manager CAx Methods

I Summary

Challenge: The generation of test data is an expensive business - be it in the crash tests, in the wind tunnel or any other of the various test beds of the Audi research and development department.

Therefore, test data is a resource that is considered to be of high worth for reuse and enterprise-wide publication. Process safety and reproducibility in the product development process requires a commonly readable and transferable description, both of test contexts and results.

ASAM ODS provides the basic framework for the persistent storage of test context descriptions and test data itself. Unfortunately, the wide variety of disciplines covered by ASAM ODS has lead to a high complexity of the standard. As a result, a native, "from scratch" ASAM ODS system implementation requires high effort and definitive expertise both at the IT and application level.

Solution: The MDM toolkit published by Audi, as public domain free software, shrinks down the ASAM ODS complexity by defining common application patterns for almost all measuring data management use cases. Generic approaches (catalogues, templates, generic system descriptors, MDM component model) are applied to provide the necessary degrees of freedom for customizing the MDM toolkit to a wide range of application scenarios.

The MDM toolkit is now available for free under the conditions of the MDM community software exchange. Companies which operate testing equipment themselves are invited to join the community.

Key Benefits: The MDM community provides a platform for the exchange of components for measuring data management, cutting down costs for in-house software development. As a result of the complete compliance to the ASAM ODS standard, plus further MDM specifications, there is a real chance for the reuse of the components provided by the community members.

II Situation

Modern engineering methods require an instant and wide spread interchange of test data, provided a clear semantic description of the data content is available. One can say: To realize the value of test data, it must be reusable in multiple contexts. Generating, archiving and publishing test data shall be recognized as an enterprise product data management service.

Obviously, it is not realistic to expect all those requirements described above to be met by a set of compatible (software) products from only one vendor. As a result, measuring data management has to deal with complex and heterogeneous system environments. The inherent complexity of system environments of this type directly leads to the idea of standardization.

At this point, ASAM ODS comes into play as a rather complete standard for the description of test contexts and data. Audi, as a leading manufacturer of premium automobiles, therefore declared ASAM ODS as the enterprise standard for measuring data management. As a consequence, a methodology for the ASAM ODS application was developed: The Audi MDM toolkit.

Meanwhile, this toolkit has been applied in several real system instances, as a system for managing acoustics data, another system for

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vehicle performance and fuel economy and – last but not least – in a system for the storage and publication of suspension component characteristics. The Audi MDM concept has been established as a proven and practicable technology.

III Challenges

As the Audi MDM toolkit is designed to be extended by new components, new test description patterns and new business objects (for instance measurement result types), the idea to treat it as open source is a logical consequence.

Open source software projects are known for their potential agility and for the high quality of the software enforced by the distributed development of system components.

Nevertheless, the risk of abuse by re-packaging (closing) the software has to be reduced by suitable terms of use and a charter. The initial intention to provide multilateral benefits must be guaranteed permanently.

IV Success strategy

Audi published its MDM toolkit as open software on the Web on November 9th, 2007 on the MDM community website http://www.mdm-community.org. The MDM community was established this way as a platform for the maintenance and the free distribution of the MDM toolkit resources.

Since November 2007, there has been good feedback, and several companies decided to join the MDM community and to evaluate, or even apply the MDM strategy.

V Challenges during the project

The MDM application model had suffered various modifications until now. It is not an easy task to find the right balance between the flexibility for various disciplines (e.g. crash, components, acoustics etc.), a manageable complexity, performance requirements, an all out ASAM ODS standard compliance and – last, but almost most important – a simple and well structured user interface.

The MDM team has made many successful efforts to finally resolve all related conflicts. The quality of the solution in most cases has been considered more important than a possible project delay.

Up-to-date technologies such as an ECLIPSE based development, the Corba Component Model (CCM) and Service Oriented Architecture approaches (SOA) are used as the base for MDM system design. The challenge to control the influence of new technologies on MDM, without causing risks or loosing the orientation to the end user, has successfully been faced by the Audi MDM team. MDM now is mature.

VI Business benefits

The Audi MDM toolkit provides an efficient, safe and nearly out-of- the-box strategy for the implementation of measuring data management systems. The system implementation can now be realized in a few simple steps.

The complexity of ASAM ODS based systems is cut down to exactly what is necessary to implement a professional system, without loosing key benefits as complete test context description, full data semantics representation and software vendor independency.

The MDM community invites companies operating themselves test equipment to an agile, pragmatic development of the MDM toolkit on a safe and beneficial base for all community members.

Software vendors and companies working in measuring data management projects can reuse the MDM software for the projects of their customers.