



Research Project

MINT: Model-Driven Integration of Information Systems

What is the best way for the integration of business software - with particular focus on the data access layer?



Which solutions are applicable for the integration of different data architectures?

What are the advantages and disadvantages of the different approaches?

Where are the benefits of model-driven methods?

When does the usage of generative tools pay off?

The Project

The project “Model-Driven Integration of Information Systems” (MINT) aims at providing an efficient model-driven development method for the integration of existing (heterogeneous) business information systems. For this purpose a range of different methods for the integration of legacy systems into modern environments as well as for the integration of individual software into a standard business software context is subject to investigation and evaluation work.

MINT is a project of the research programme “Software Engineering 2006” of the German Federal Ministry of Education and Research (BMBF).

The Members

The project’s scientific head is Prof. Dr. Ralf Reussner, chair for “Software Design and Quality” at the faculty for computer science at the University of Karlsruhe, Germany. Project members are:

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- BTC
- Delta Software Technology
- FZI Research Center for Information Technology
- OFFIS
- University of Oldenburg, Dept. for Educational Systems

Project executing organisation is the German Aerospace Center (DLR).

Delta @ MINT

The generation technologies and tools from Delta Software Technology belong to the set of solutions investigated in this project. Deltas solution automates the integration of legacy systems and simplifies the integration of standard business software and individual software.

The central component of Delta's solution is the product SCORE[®] Adaptive Bridges - Data Architecture Integration[™]; it is used to provide existing applications, functions and data from different systems and architectures as flexible services in modern environments.

Focusing on Data Integration

Within the overall topic "integration" the data integration takes a prominent place. It is a decisive precondition for the efficient integration of applications and processes. In many cases it is the first step on the long road to agile IT. In other cases it is simply the minimal solution to provide the right data in just time.

Additionally, the data integration task is characterised by very high demands: on the one hand the last decades have devised extreme different worlds of data with very different interfaces; on the other hand the quality requirements concerning performance, reliability, scalability and security have increased.

Nothing Works without Models

By now, models are indispensable elements of the software development process, substantially contributing to the increase of efficiency and quality assurance. Especially the design of data management layers is strongly coupled with the usage of models. The current trend to regard models as true development artefacts has merit just here. Being a main attribute of model-driven development (MDD), this way of developing software has been put into practice already many times.

However, up to now this is true primarily for the new development of systems, for example according to the Model-Driven Architecture (MDA) of the Object Management Group (OMG). The MINT project starts right here where MDD methods and the task of integrating existing systems meet.

MINT - The Project

The project's goal is the definition and validation of a model-driven development proceeding for the integration of existing heterogeneous business information systems. For this purpose competing model-driven development methods and products for the data integration of existing systems are applied. They are assessed by means of Goal-Question-Metrics (GQM).

In detail, the model-based coupling of modern, object-orientedly modelled business logic with existing relational database systems is investigated.

Solution Alternatives: Generic or Generative?

This coupling, especially the necessary object-relational mapping, is implemented by adapters. Test applications with different data access characteristics allow for a conclusive comparison of the (very) different adapter concepts.

Generic adapters support all test applications but they are specific for the used DBMS and the used database schema. They are data-centred and implement an object model according to the database schema. There are static solutions, developed for the concrete object model, as well as dynamic solutions. The dynamic solutions perform a runtime mapping, and have to be configured correspondingly. By contrast, generated adapters implement a mapping that is specific for the respective application. Thus they are application-oriented.

SCORE Adaptive Bridges Data Architecture Integration

The generative tool SCORE[®] Adaptive Bridges - Data Architecture Integration[™], developed by Delta Software Technology, is one of the solution alternatives that are examined in the project. This solution provides fully automatically generated adapters implementing the mapping of the "service interfaces" onto the data objects - tailor-made for the application and specific for the used database section and the used DBMS.

The automation comes along with high performance, low development costs, absolute reliability of the generated source code, as well as drastically reduced test efforts.

Delta Software Technology

Delta Software Technology specialises in advanced software generators for the integration and modernization of business applications.

Delta's outstanding generative solutions bridge the gap between legacy and modern technologies, creating value from an ever-changing world by building applications that quickly and securely adapt to

changing business requirements, technical infrastructure and available resources.

Known as "The Generator Company", Delta combines its standard products, core technologies, latest research results and focused professional services to deliver bespoke generative solutions that automate and optimize integration and modernization projects.

Delta has a 30-year track record of successfully delivering advanced software generator technology to Europe's leading organisations, including AMB Generali, AXA, Deutsche Telekom, IDG, La Poste, RDW, Schorch, Suva and UBS.

More Information



Please visit our Web site if you would like further information about our products and services, or to locate your local certified solution partner.

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