

# Metasafe – an erDBMS in a nutshell

## Complexity is here to stay



The world becomes more complex every day and new IT applications must manage increasingly complex data: data structured into lots of entity-types are connected by a dense network of relationships. Squeezing these into a set of tables of an RDBMS is costly and complex.

You pay for that in many ways:

- The conceptual model is never really tested
- The original conceptual model is outdated and discarded
- The access to the database requires cryptic SQL-statements

The relational model is designed to store data in tables. The relational model is not designed to store complex models and complex data in a graceful manner.

## One type of database does not fit all!

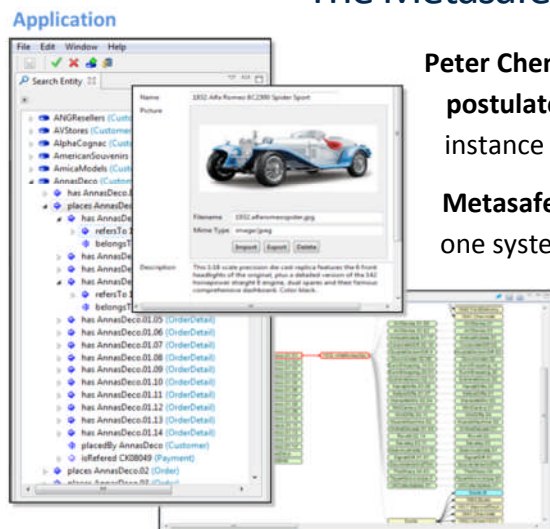
- The impedance mismatch separates Business and Implementation
- Thick layers on top of an RDBMS are needed to deal with complex data
- Files and libraries are the primary storage for development artifacts
- Maintenance is expensive and risky due to lack of reliable models
- Planning and reporting on management level resorts to Excel

## Conclusion – use the right tool for the right job

- Data models are important blueprints of systems – they should be properly tested and maintained throughout the entire life-cycle of a system
- Complex data require a specialized DBMS – an entity-relationship DBMS
- Metasafe is such an erDBMS – it integrates models and instance data



## The Metasafe solution – an executable conceptual model



Peter Chen, the inventor of the entity-relationship model (ER model), postulates that ER-modeling should be extended from modeling to host instance data to bridge the well-known impedance mismatch.

Metasafe seamlessly integrates conceptual models and instance-data in one system: As a consequence, changes and extensions of the data models become simple update transactions – without unloading and reloading the database.

The new structures at the instance level are ready immediately after committing the model update.

Conceptual information models and submodels and their documentation are managed in the database and tested with data. They are protected by proper multi-user access control.

## Metasafe tools make life easier

- metaModeler** Design and document conceptual data models and submodels and specify user access rights to instance data. Configurable graphical models are automatically generated. metaModeler is an Eclipse based multi-user multi-model Editor.
- metaEditor** Browse along the data models through your instance data, controlled by the model defined access rights. metaEditor is an Eclipse based, model-driven, multi-user configurable data browser and editor: no programming required!
- metaExcel** Exchange information between the office world and the database world using metaExcel as a smooth, bi-directional data bridge.
- erSQL** Navigate through your conceptual model, retrieve data and display the results in a table or export them to Excel. Users and specialists create queries with the graphical query builder; developers use erSQL-queries via the the Java API.
- BIRT** Create high quality reports and cube-structured BI-results using the erSQL interface between Metasafe and BIRT, the open source **B**usiness **I**ntelligence and **R**eporting **T**ool.
- Java-API** Develop model driven applications using this powerful framework. It provides direct access to data models and instance data stored in Metasafe.

## Highlights

- Model driven** Applications are more flexible and easier to extend to new functionality. They are entirely controlled and documented by the model and use the metadata stored in the model. Hence the impedance mismatch does not exist.
- Active dictionary** Data models and instance data are stored in the same database. Therefore data in the database are always consistent with the model and can be processed with model-driven applications.
- Versioning** Applications are relieved from versioning. Metasafe handles multiple manifestations of entities – revisions, variants and catalogs.
- Web2.0** The web-tools of Metasafe follow the dynamic Web2.0 paradigm (and not outdated static JSP-pages). They are easy to extend with the Eclipse plugin mechanism.
- Secure** Transactions guarantee data base integrity according to ACID rules.
- Scalable** Metasafe provides full scalability on the model and on the instance level. Metasafe handles GB of data – metadata and instance data on one platform.
- Based on standards**
- > Metasafe is a homogenous pure Java system (no hidden legacy C, C++ etc).
  - > Metasafe integrates the standard scripting language JavaScript (and not a proprietary relict from the 80es).
  - > Metasafe has an open 4-level Metameta-structure M0 to M3 (in contrast to a monolithic chunk).
  - > Metasafe supports standard import/export via XML, XLS and csv.
  - > Metasafe tools are based on Eclipse (and not a proprietary framework).
  - > Metasafe is open for extensions with configurable plugins.

## Features, benefits and advantages

Metasafe has been designed specifically to meet the needs of users who deal with complex and volatile information. Metasafe enables them to gain better control of their important information assets. Long term experience in IT-development, IT-operations, planning and modeling flew into the development of Metasafe.

**Metasafe speaks and understands the language of users and specialists alike.**

Feature	Purpose	Advantage
<b>Concepts</b>		
Conceptual models	Centralized documentation about information	Better managed information assets. Better quality of data models and data
Cloned submodels	Support individual views	Submodels are easy to understand and consistent with enterprise model.
Graphical output	Visual documentation	Easy to understand, automatically created, configurable to user requirements
Management of instance data	Keep data model and instance data in sync	Avoid the impedance mismatch and the creeping degradation of the documentation.
Versioning	Automatic handling of versioning by DBMScore	Application development is relieved from implementing versioning.
Model based access rights	Protect data against unauthorized access	Fine grained access rights are easier to grant and easier to understand.
<b>Tools</b>		
erSQL query language	Structured access language for easy data access	Users and specialists can use it on the spot. Queries are self-documenting
erSQL editor	Create queries in graphical dialog	No language barrier, results in minutes
Modeling tool	Transaction protected multi-user modeling	Several designers can work in parallel. Big models can be managed.
metaEditor	Direct query, update, browse of the database	No program required to access the database. Access is configurable and flexible
<b>Integration</b>		
BIRT interface	Reporting and BI with the Eclipse report engine	No program required to create high quality reports and analysis and analysis of cubes.
metaEXL	Bi-directional data exchange with Excel	Endusers love it, data management controls it Consolidate an Excel-farm
Multi-user capability	Secure access for many users to shared data	Secure sharing of common information Avoid redundancy (copies of Excel sheets)
Java API	Service package for application developers	Readymade functions for application developers. Full access to all functions
Plug-in external sources	Connect external data stores – databases, files etc	Smooth coexistence with other data Easier incremental migration
<b>Technique</b>		
Eclipse based user interface	Standard known multi-window GUI	General standard, easy to use / to learn Developer: plug-ins to extend the functionality
Web-2.0 Access	Use and maintain the repository via the web	Easy, controlled access for many users Easy to manage web-application
Open architecture	Fit into an existing ecosystem; standard access techniques	Fits smoothly into an existing environment Easy to install and easy to manage
Multi GB data store	Store large models and data volumes	Avoid scattering of data models and metadata Non redundant centrally accessible data
Platforms	Windows, Unix	Metasafe runs where Java runs

## Applications benefit from Metasafe

**Information management** **Information is a crucial asset.** Information about information (Metadata) keeps track of the availability, use, purpose of business data. Metasafe helps you to model, document the **enterprise metadata** and offers an easy access to all stakeholders.

**Application portfolio** **Manage the lifecycle** of your applications from acquisition to de-commissioning with a proper IT map. Maintain crucial information about all applications, licenses, investments, running cost and business value, pending requirements to manage innovation, dispose legacy systems, optimize production systems and absorb innovation.

**Application development** **Conceptual data models are the blueprints** for application development – the molds into which application code is cast. Develop, test and maintain data models with Metasafe – reduce development and maintenance cost and create agile applications.

**Development of tools** **Development tools deal with complex connected artifacts.** Tools of the past managed their data in files and proprietary blobs or isolated databases – tool integration was a nightmare. With an erDBMS tools can store their models and instance data in a database shared by tools and by users. Create better, more flexible tools, smooth integration and more benefit for users.

**Investment portfolio** **Assess investment requests** and keep track of competing investment requests. See [www.valuationManagement.com](http://www.valuationManagement.com)

**Database research** **Peter Chen on «the future of databases»:** An «executable conceptual model» let users and developers work at the level of the conceptual model and relieve them from the intricacies of object-relational mapping and complex SQL commands. Metasafe is the first step in this direction.

## Users of Metasafe

System architects, data managers, developers of software tools, students and professors, researchers, software houses and consultants

## Where Metasafe fits best

**Manage complexity** **Metasafe is the best choice** for applications with GBs of data, hundreds of types (entities, relationships, attributes), complex relationships, high demand for flexibility and ease of access.

**Ideal platform** **Metadata is the ideal platform** for metadata management, configuration management, CMDBs (configuration management databases), replacement for large Excel-populations, planning and analysis-tools, data infrastructure for modern development tools.

## More Information – browse our website

[Metasafe-Repository.com](http://Metasafe-Repository.com)