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## 1 Provinzial realizes complete migration from IBM IMS/DB to IBM Db2 with Delta

With the tools and services from Delta Software Technology, Provinzial Rheinland finished the complete application and data migration from IBM IMS/DB to IBM Db2, automated and securely, of over 75 IBM IMS databases and over 36,000 artefacts.



### Provinzial: Its Modernization Strategy

On their website, the Provinzial Rheinland writes: "Insurances are not sexy - we know that. But it is wise to make provisions." And further: "The goal of our employees in the office and in the field service: create freedom in the lives of our customers by ensuring a holistic security." The Provinzial also acts in the same way when modernizing their IT: Create good provision, security and freedom.

The central IT systems of insurance company Provinzial Rheinland (Provinzial) are self-developed applications on an IBM mainframe. In the medium term,

Provinzial wants to move to an open platform (UNIX/Linux). The first step in their modernization strategy is to migrate all applications and data from IBM IMS/DB to IBM Db2.

*"The Delta solution has its advantages in two points that are particularly important to us: Due to the complete automation of the transformation, the ongoing development of the system, as requested by the business, was uninterrupted during the entire project. Due to the in-place migration and a parallel operation concept, we achieved absolute security and quality during the migration. The guaranteed operational "smoothness" in the project, despite the complex modernization, is certainly a unique feature of the solution."*

*Stephan Kaiser,  
 Program 'sponsor' Provinzial*

Due to the volume of the Provinzial application systems, the amount and complexity of the required changes, the tight schedule as well as their experiences with the manual conversion of some programs and databases, Provinzial decided on a tailor-made and fully automated solution with the tools from Delta Software Technology (Delta).





## The Project DINO

Migration of the central applications and data from IBM IMS/DB → IBM Db2

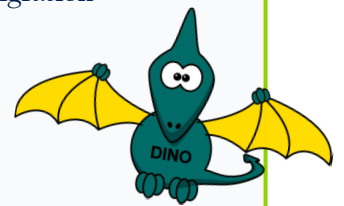
- ✓ Data model transformation      ✓ Application transformation      ✓ Data migration

### Sources

- More than 16,500 COBOL programs
- More than 20,000 copybooks
- 25 million lines of primary code
- Expanded more than 70 million lines of code
- More than 16,000 data accesses
- More than 75 IMS databases

### Hurdles

- Paradigm change from IBM IMS/DB to IBM Db2
- High complexity and high degree of networking of applications
- Application logic was not allowed to be changed
- Parallel further development and maintenance
- Performance



The DINO has been designed using resources from pixabay.com

## Successful Migration with Delta

With Delta's solution, Provinzial was able to successfully migrate all applications and data completely and absolutely secure from IBM IMS/DB to IBM Db2 and ... at a fixed price.

These advantages of the Delta solution were particularly important for Provinzial:

- **Tailor-made solution:** Provinzial was free to design the new data model and choose between alternative transformations. This allowed them to directly influence the performance of the applications and ensure that the new data model would be fit for the future.
- **Complete replacement of IMS/DB:** No emulation, but clean applications as if they had originally been developed with IBM Db2.
- **No Freeze:** The repeatability of the processes allows the undisturbed parallel further develop-

ment and maintenance of the modules that will be transformed; blockade times were eliminated.

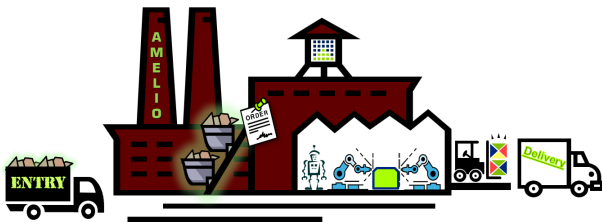
- **Maximum security:** This was ensured by the rule-based and automated implementation of all changes, meta-level tests (verification of the transformation rules and complete testing of the transformation results prior to the actual modification of the sources) as well as a continuous, completely closed process ("clean room") from the analysis to the transformation - instead of implementation "by human hand".
- **Flexibility:** Data and application transformation were decoupled and could be performed independently of each other.
- **No "point of no-return":** In the case of new recognitions, extensions of the set of rules or new program versions, modules that had already been converted simply went through the transformation process again.



- **Audit-proof:** Every application and data transformation were automatically and completely documented.
- **No follow-up costs, no “footprint”, no “vendor lock-in”:** After project completion, there are no licensing or maintenance costs for tools or new runtime components.
- **Implementation in-budget at a fixed price**

*“We were impressed by the efficiency and flexibility the AMELIO factory was set up and continuously optimised with. The very good and close cooperation with the Delta managers and employees also contributed significantly to the success of the project.”*

*Ralf Prediger, Provinzial Project manager*



## The Highlights of the Delta Solution

The change from IBM IMS/DB to IBM Db2 is a paradigm change that affects not only the storage of data, but also the entire program logic for the data accesses in all applications. In addition to the data transformation, extensive changes to the programs were therefore necessary. However, the functionality, interfaces and data structures were not allowed to be changed.

The following highlights describe how Delta met Provinzial’s high requirements.

### Clean Relational Data Model and Migration of the Data

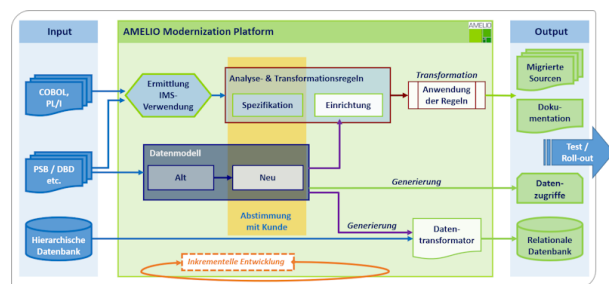
Due to the technological differences of the database models, implicit definitions of the accesses, struc-

tural features and others, a 1:1 transformation of the hierarchical system IBM IMS/DB to the relational IBM Db2 is not possible.

Delta determined the IMS data model that was actually used in the sources and data structures as well as all dependencies and interrelationships. A proposal for the new IBM Db2 data model was automatically generated from this information. On this basis, the experts at Provinzial developed the new relational data model, that will also meet future requirements.

The data model and the mapping rules created by Delta provided the basis for the transformation of the data as well as for the generation of the IBM Db2 accesses, so that changes to the data model automatically and identically affected the application and data transformation.

Service programs generated with Delta ADS were used to migrate the data from IBM IMS/DB to IBM Db2.



### Fully automated transformation with AMELIO Modernization Platform

In an iterative process, Delta built a customised transformation factory for Provinzial with the AMELIO Modernization Platform. This factory works rule-based and fully automated



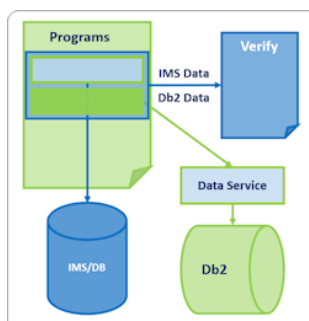


according to a clean room concept. All changes are implemented consistently and audit-proof in all sources without any manual interventions. The transformations were perfectly tailored to the requirements of the project. Operational features, standards or special implementation rules for the performance improvement were also considered.

The complete automation of the transformation guarantees maximum security on the one hand, and on the other hand it enables flexibility and short reaction times for new requirements. In addition, the testing effort is drastically reduced by the rule-based working method.

### Implementation of Data Services

Data services were automatically generated for the accesses to IBM Db2. They deliver the data and status values exactly as required by the programs - despite the paradigm change.



The logic of the programs and the interfaces were not changed, naming conventions and programming guidelines were considered. The decoupling of application and data accesses has the additional advantage that changes to the data model must not have any effect on the programs.

### Extra Security and Flexibility through Special In-Place Migration

The migration was performed step by step as a so-called in-place migration. For this purpose, all data accesses were performed simultaneously on both database systems, i.e. for IBM IMS/DB and also for

IBM Db2. For control purposes, a switch system was implemented that would have allowed the re-activation of the old system in production at the push of a button at any time in the case of an error. In this way, all data could be compared automatically and all programs could be verified - and not only in the test environments, but also in the productive environments.

Subsequently, AMELIO CleanUp Factory was used to remove again all code components for accessing IBM IMS/DB and for the switch control of the in-place migration step. The result is clean sources, just as if they had originally been developed for IBM Db2.

*"Thanks to Delta's transformation strategy, Provinzial succeeded in migrating absolutely securely from IBM IMS to IBM Db2. At the same time, this solution gave us absolute flexibility, as components that had already been transformed and those that had not yet been transformed could be used productively together without any problems."*

*Ralf Prediger, Project Manager of Provinzial*

### Performance

The change from extremely fast IMS databases, whose application programs are often precisely aligned with the storage structures, to the more flexible Db2 databases, which are suitable for ad-hoc requests, often leads to losses in performance. Provinzial also feared this. However, due to the automated migration and the possibility to individually adapt the transformation rules, there were no performance losses. The specifications for the performance of the migrated applications were met to Provinzial's complete satisfaction: A goal that was achieved in particular thanks to the good cooperation with the Provinzial project team.



## Delta Tools for Tailor-made fully automated Migration

The following tools from Delta Software Technology were used for the fully automated transformation of the applications and migration of the data:

- **AMELIO Logic Discovery**  
The comprehensive assessment of the applications with AMELIO Logic Discovery provided the information on all the project's sticking points, for the migration strategy, a precise planning and the reliable cost calculation.
- **AMELIO Modernization Platform**  
The tailor-made, fully automated transformation with AMELIO Modernisation Platform guaranteed the consistent and audit-proof migration of the applications.  
In this project, AMELIO was also used to gain additional security and flexibility in the project through in-place migration.
- **AMELIO CleanUp Factory**  
Clean, fully automated removal of all superfluous code.
- **Delta ADS**  
Automatic generation of the data transformers for the migration of all data from IBM IMS to IBM Db2.

## The Company Provinzial

The Provinzial Group is a public insurance group. With a gross premium volume of more than 6 billion Euros, it is one of the ten largest German insurers. The former Provinzial Rheinland Versicherung AG (Provinzial Versicherung AG since the end of 2021 following the merger with the westfälische Provinzial), which is headquartered in Düsseldorf,

offers its private and corporate customers products and advice on all insurance topics, including home, liability, motor vehicle, accident, life, pension, occupational disability, health, long-term care, legal protection, and more.

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With the tools and services from Delta Software Technology, Provinzial Rheinland finished the complete application and data migration from IBM IMS/DB to IBM Db2, automated and securely, of over 75 IBM IMS databases and over 36,000 artefacts.

[Read more ...](#)

## Further Information

Here you can find more articles:

- **Gothaer Systems starts migrating its IBM IMS Databases**
- **Automatically replacing IBM IMS/DB**
- **Successfully Replace IMS Databases**
- **IBM IMS/DB? Modernization Now!**
- **Modernization Project at BSQ Bauspar AG**

**Gothaer Systems starts migrating its IBM IMS Databases**

Together with Delta Software Technology GmbH, Gothaer Systems is consolidating its IMS databases into IBM DB2.

[Read more ...](#)

**AMELIO Modernization Platform - Replacing IMS Databases**

Safe Replacement of IMS Databases: How to Succeed!

[Read more ...](#)



## 2 24th GI Workshop “Software-Reengineering & Evolution”

The 24th Workshop “Software Reengineering & Evolution” of the GI specialist Group Software Reengineering (SRE) took place this year from May 2nd to 4th, 2022.



**GI: 24th Workshop**  
**Software-Reengineering & Evolution**  
02.-04. May 2022, Bad Honnef, Germany

Dr. Daniela Schilling (Delta Software Technology) presented a concept and the solution as well as its utilisation by Delta's client RDW in order to make applications quickly and safely fit for the future at the 24th Software Reengineering & Evolution workshop of the German Informatics Society's (GI) special interest group on Software Reengineering (SRE):



### "A Washing Machine for Software - Automated Clean-up of Technical Debts"

#### Abstract

RDW has been developing and maintaining vehicle management applications for more than 30 years. The applications work reliably, but over time technical debts have accumulated that make maintenance and further development difficult. The daily business as well as the size and criticality of the application do not allow a manual clean-up of the software. The solution of the problem: a washing

machine that automatically cleans the software from the technical debts.



#### *A Washing Machine for Software - Automated Clean-up of Technical Debts*

*RDW has been developing and maintaining its core business applications for over 30 years. The applications work reliably, but over time technical debts have accumulated that make maintenance and further development difficult. The daily business as well as the size and criticality of the application do not allow a manual clean-up of the software. The solution for the problem: a washing machine that performs an automated cleaning of the software from its technical debts.*

*Read more ...*

#### Our Speaker

**Dr. Daniela Schilling**

Dr. Daniela Schilling is Managing Director of Delta Software Technology.



#### Further Information

“The Gesellschaft für Informatik e.V. (GI) is the largest and most important professional society for computer science in the German-speaking world. It represents the interests of computer scientists in science, business, public administration, society and politics. Become part of this lively network!”

Further information on the event can be found here:


<https://fg-sre.gi.de/veranstaltung/24-workshop-software-reengineering-evolution>

You couldn't attend? Then contact us, we would be happy to meet you for a personal discussion.





### Suitable for this...



**RDW removes technical debts using Delta's automated solution**

*Existing applications have accumulated a lot of technical debt over the years. Removing it could speed up maintenance significantly. In reality the task of improve the software by removing the obsolete parts is seldom performed. The risk of introducing errors and the cost of testing is the biggest reason for not doing anything.*

[Read more ...](#)

Using the option *OPT-L*, you can have the control code for iterations be optimised.

Do you already know the option *OPT-O*? Using this option will optimise the generation of control statement and thus will minimise the generation of GOTOs.

In addition, we have released a new version of our plugin *ADS on Micro Focus Enterprise Developer (7.2.4)*.

You can find more information about new features and fixes in the release notes at the [support area](#) of our website.

Get information and [updates](#) right now. You'll find the list of our current [product versions](#) here.

## 3 Support Information: New Product Version of Delta ADS available

Wir We have released a new version of our generative development system *Delta ADS for COBOL*. With the release 6.5.1 a new optimisation option for the code generation has been implemented:

