



case study

GRUPO

EDSON

QUEIROZ

Grupo Edson Queiroz selects generative solution from Delta Software Technology for major migration project from Bull DPS7 to UNIX.

The Edson Queiroz Group (GEQ) is one of Brazil's leading corporate groups, employing 14,000 people in 16 companies.

Their challenge was to migrate many thousands of programs using the IDSII Codasyl database from Bull DPS7 mainframes to industry-standard UNIX servers running the Oracle database.

Read this case study to learn why GEQ selected the generative tools from Delta Software Technology for their migration project, adopting a careful step-by-step approach.

"The migration solution presented by Delta Software Technology from Germany was an ideal match to our needs."

*Alberto Moreira
Systems
Development
Manager, GEQ*

Platform Migration with Delta Software Technology



SOLUTION OVERVIEW

customer

Grupo Edson Queiroz (GEQ) is one of Brazil's leading corporate groups and employs more than 14,000 people in 16 companies. GEQ is active in the areas of liquid petroleum gas distribution, mineral water and beverages, mining, media and communication, farming and agribusiness, real estate and education.

challenge

Reduce migration costs and risks while maximizing quality in a project covering the migration of several thousand programs from Bull DPS7 mainframes with an IDS/II database to UNIX platforms with Oracle as database.

Delta Software Technology solutions

- ADSplus™ – Online and Batch
- SCORE® Data Architecture Integration™ (formerly: ADSplus™ – Data Access Server)
- SCOUT2™ Development Platform
- ANGIE Frame Generator™

why Delta Software Technology?

Using a combination of standard Delta products and project-specific generators allows GEQ to perform an automated migration – with the least possible risk and duration, while achieving a high level of quality.

key business benefits

- Maximize return on investment in existing mission-critical Bull DPS7 applications by directly reusing functionality on new UNIX platforms with Oracle.
- Reduce risk using a step-by-step migration where only one major element is changed at each step.
- Enable a future-proof migration from IDS/II to Oracle by replacing IDS/II specific coding with high-performance data access servers and neutral, database independent command sets.
- Use tailor-made, project-specific generators to maximize quality and repeatability.

“We have been impressed by the close co-operation and outstanding assistance of the whole Delta team throughout the evaluation period and pilot project.”

*Alberto
Moreira
Systems
Development
Manager, GEQ*

MIGRATION STEPS

SCOUT² Development Platform

Install SCOUT² Development Platform on Microsoft Windows to enable local development and generation on modern workstations.

ADSplus

Install ADSplus and upgrade applications from older Delta/ADS solution. Applications stay on Bull DPS7 mainframe with operating system GCOS7 and TP monitor TDS7. Stored data remains unchanged in the IDS/II Codasyl database and is accessed using native commands embedded in the application programs.

automated discovery

Use Delta's automated discovery tools to analyze the existing applications and database, storing the gathered information in an XML-based repository for detailed analysis and reporting with standard tools.

data access servers

Build project-specific generators with Delta's ANGIE frame-based generator technology to
(1) create data access servers,
(2) modify existing applications replacing native IDS/II command with database independent access to data access servers.

IDS/II on DPS7

Generate the applications for DPS7 using IDS/II access with new data access servers. Replacing embedded IDS/II commands with data access servers can be verified on the existing IDS/II databases running on the legacy Bull DPS7 platform.

Oracle on DPS7

Migrate database on DPS7 from IDS/II to Oracle. The applications now are database independent so only require that data access servers are regenerated for Oracle on DPS7. Migration from IDS/II to Oracle can be tested in the known Bull DPS7 environment.

Oracle on UNIX

The final step is to regenerate the applications for the UNIX platform with Oracle. Applications already have been tested with Oracle on DPS7 so only limited additional testing is required. As the programs developed with ADSplus are platform-independent, all aspects that do not concern the database remain unchanged when migrating from DPS7 to UNIX

“Delta worked with us to study and understand the current situation and then define the best migration strategy.”

*Alberto Moreira
Systems
Development
Manager, GEQ*

“We are pleased to be working with GEQ on this major project, showing how our tools can deliver real benefits.”

*Rüdiger
Schilling
CEO,
Delta Software
Technology*

THE CHALLENGE

Grupo Edson Queiroz (GEQ) is recognized as one of the leading and most entrepreneurial companies in Brazil. Based in Fortaleza, GEQ employs 14,000 people and has been an integral part of the business culture in Brazil for more than 50 years.

GEQ comprises 16 companies operating in liquid petroleum gas distribution, mineral water and beverages, mining, media and communication, farming and agribusiness, real estate and education.

GEQ is committed to the welfare and development of all employees, spending more than 21 million Brazilian Reals each year on comprehensive social benefits including health and dental care, crèches, professional training and on-going development.

GEQ decided to undertake a series of strategic projects to better support the requirements of their dynamic and growing organization. A core part of this strategy is to change their strategic IT platform from Bull DPS7 mainframes using the IDS/II database to industry standard UNIX servers running the Oracle database.

legacy architecture

Since the early 1990s GEQ has run its mission critical applications on Bull DPS7 mainframes using the GCOS7 operating system and TDS7 TP monitor. Enterprise data is stored using UFAS indexed file system and the IDSII Codasyl database.

The core applications were developed using the Delta/ADS code generator system from Delta Software Technology – an earlier version of the current ADSplus product. GEQ has used Delta/ADS to develop several thousand online and batch programs. Database access to IDS/II is by native database calls embedded throughout the application programs.

Over the years GEQ has kept pace with their continuous growth and changing requirements by making many extensions and enhancements to their core applications. All program development and maintenance work is currently performed directly on the Bull DPS7 mainframes, using the standard Bull COBOL compiler, test tools and system utilities.

**the new
architecture**

GEQ decided to move their existing portfolio of Delta/ADS applications from Bull DPS7 mainframes to UNIX platforms. The existing IDS/II Codasyl database is to be replaced by the Oracle relational database running on UNIX.

The COBOL code generated for the UNIX platform from the Delta/ADS programs would be deployed using the COBOL compiler for UNIX from Micro Focus.

**migration
with
minimum
risk and
maximum
ROI**

The challenge for GEQ is to effectively migrate their existing applications from Bull DPS7 mainframe to the new UNIX platform. A key objective was to reduce to the absolute minimum the number of program changes required during the migration. To reduce the workload on the application development group it would also be desirable to use automated migration tools as much as possible.

A direct migration of the core application functionality and screen handling would be enabled by GEQ's use of the Delta/ADS code generator. This development tool isolates the applications from all the details of the operating system, TP monitor and screen handling.

The existing architecture was based on the IDS/II database that uses the Codasyl model with its records, realms and sets. For the new architecture GEQ had decided on the Oracle that implements the relational model with its tables, foreign keys and cursors.

Mapping from the Codasyl to relational models was always going to be a major challenge as these are completely different approaches to the design and use of databases. For GEQ the situation was further complicated as IDS/II database access commands had been embedded throughout the thousands of application programs. All of these specific IDS/II commands would have to be found, identified, analysed and replaced to allow access to the new Oracle database.

THE SOLUTION – DELTA SOFTWARE TECHNOLOGY

GEQ invited several leading companies to propose solutions for approaching their ambitious migration project. After careful evaluation of a broad range of alternatives, GEQ selected the migration strategy proposed by Delta Software Technology as being the best fit to their requirements.

GEQ originally approached Delta via the Web site. This led to highly experienced members of the Delta team spending time on site at GEQ in Brazil to understand the goals of the project.

Once the project objectives were understood the current status of the applications and their data stores could be analysed, a key aspect was to verify exactly which versions of the wide range of development products had been used on the Bull DPS7 system.

Delta Software Technology proposed a migration strategy based on the use of a combination of standard Delta products, supported by custom generators and associated tools to be built using Delta's advanced generator technology.

Having presented to GEQ the proposed approach, Delta Software Technology was asked to undertake a pilot project to verify the correct operation of the core technology and to prove that the proposed step-by-step migration approach would work in practice.

The pilot project successfully showed the proposed migration would work. Part of the GEQ application was migrated from Bull DPS7 with IDS/II to Oracle on DPS7, from where it could move to Oracle on UNIX. The pilot successfully demonstrated to GEQ the concept for introducing the database independent accesses to data access servers and how they are easily regenerated from one database target to another.

The following Delta products and custom tools were proposed to GEQ for their migration project:

“We look forward to work with Delta to make our strategic migration project a success.”

*Alberto Moreira
Systems
Development
Manager, GEQ*

ADSplus

ADSplus – the latest version of Delta’s successful application development product – allows the easy regeneration of Delta/ADS applications from one platform to another. Applications are defined in a platform-independent meta language from which one or more platform-specific implementations are automatically generated.

GEQ’s Bull DPS7 online and batch applications were developed using Delta/ADS. These programs can be easily migrated to the most recent version of ADSplus, and from there the programs can be regenerated for the deployment on UNIX.

All screen handling logic in the programs has been implemented using standard Delta/ADS online functionality and then generated for Bull DPS7 and the TDS7 TP monitor. Using the standard portability features of ADSplus the applications can be regenerated for Delta’s text-mode screen management system VSI on UNIX.

data access servers

ADSplus supports data access servers that are independent of the underlying database technology. A platform-independent definition of the data access server is used to generate a platform-specific implementation for a selected database product. Generation targets include IDSII on DPS7 and Oracle on both DPS7 and UNIX.

The strategy for the migration is to remove the embedded platform-specific IDS/II database commands from the existing programs and replace them by neutral calls to the generated data access servers. Thus, the application programs use a series of neutral commands to access their data stores.

automated discovery

Automated discovery tools will be used to analyze GEQ's portfolio of existing applications and to create XML-based project repositories. These are then available for further detailed investigation and to support the project-specific generation tools. The XML repositories can be analysed and reported using standard XML tools.

The discovery tools are based on Delta's successful Year 2000 remediation product AMELIO and give the GEQ project team detailed insight and understanding of their applications, and in particular how they access and use the IDS/II Codasyl database. This goes far beyond finding single commands in the programs – a model is build of how a specific application uses the existing IDS/II database. The analysis includes information about how the databases are structured and navigated by the programs.

For Codasyl databases the navigation commands are explicitly coded in the application programs. This is very different compared to relational databases where "navigation" is defined declaratively in an abstract manner using "selects" and "joins".

ANGIE frame-based generator

A series of project specific generators will be developed using the ANGIE frame-based generator technology from Delta Software Technology. ANGIE represents the current state-of-the-art in generator technology as used in generative programming, aspect-oriented programming and other current development approaches.

ANGIE is widely used in Delta's current range of products and forms the foundation of Delta's solution for model-driven legacy integration and of intelligent service enablement – SCORE Adaptive Bridges.

Using the XML-based project repositories created from the analysis of the existing applications, a series of project specific generators will be implemented using ANGIE.

These project-specific generators will handle such tasks as finding the existing hard-coded IDS/II access commands and replacing them with the database independent access commands for the new data access servers.

**SCOUT²
development
platform**

ANGIE generators will also be used to automatically create the vast majority of the new data access server specifications that define (in a database-independent way) how data stores are used by a specific part of the GEQ application.

GEQ's migration project involves the use of a range of different products and technologies on the Bull DPS7 and UNIX platforms. The SCOUT² development platform provides the ideal platform for GEQ to integrate their development and migration tools and workflow processes to create a seamless platform-independent view across GEQ's development, test and production environments.

SCOUT² manages all compilation, linkage etc. of the platform-specific source code for the generated applications and data access servers, as well as handling change control and other common infrastructure tasks.

ADSplus and ANGIE are fully integrated with SCOUT², allowing members of the GEQ project team to manage their migration project in a familiar, flexible and extensible development environment.

KEY BUSINESS BENEFITS

Migrating the existing applications from Bull DPS7 to UNIX and Oracle with the help of products and services from Delta Software Technology will bring a wide range of tangible business benefits to GEQ, including:

better risk management

The phased approach to the migration project significantly reduces the risk for GEQ. Each step of the project can be carefully controlled and validated before proceeding to the next. Should any problems be found then the project specific generators can be enhanced and one or more migration steps easily repeated.

improved planning

The use of automation technology in the migration project increases planning visibility during the project. Using SCOUT² and the various generators the GEQ project team can easily see at any time which parts of the application have been migrated to the next step.

consistent quality

Using tools for the automatic migration ensures that the GEQ project team will have detailed control over the quality of the migration process. The detailed way in which the existing applications and their data stores are to be migrated to the new architecture is implemented in the project-specific generators, rather than just being a “written standard” in a project handbook.

Implementing migration rules in the generators ensures a high level of quality across the several thousand programs that GEQ migrates; a level of quality that would be practically impossible to ensure with a manual migration of an application of this size.

high migration productivity

Once the various project-specific generators have been developed and tested the migration can proceed on an automated basis. The sophisticated batching and scripting features of the SCOUT² Development Platform allows large numbers of programs to be migrated in parallel. The extensive use of tools reduces the load on GEQ’s project team, allowing them to focus on the quality of the migration project as well as other on-going projects at GEQ.

“Delta is providing training on ADS plus, data access servers and SCOUT² to enable us to maintain the applications ourselves following the migration.”

*Alberto
Moreira
Systems
Development
Manager,
GEQ*

**process
repeatability**

As is the case on any project of this size, it is to be expected that special cases, deviations, variants and the like will be encountered that have not been considered. In this case the special cases can be used to update the project specific generators. The relevant parts of the application can then be automatically re-migrated.

The migration process is automated and therefore repeatable – with less pressure to “freeze” the mission critical applications for the duration of the migration project. This approach provides GEQ with the flexibility to maintain the existing application while the migration project is underway.

**better
maintain-
ability**

The migrated applications will be using the latest version of the ADSplus application development solution, with all data access through platform-independent data access servers. GEQ will therefore be well positioned to reduce the cost and duration of their future development activities.

The door is also open to easily moving some or all of the applications at a future point in time to another deployment platform and/or database product – using the continuous support of the platform independence of ADSplus and the data access servers.

**pc-based
development
environment**

The replacement of the Bull DPS7 development and test environment with the SCOUT² Development Platform will significantly reduce GEQ’s development and maintenance costs. SCOUT² provides today’s professional developer with the Windows-based editors, change control and other tools that they need to be productive.

Seamless connections to the Bull DPS7 and UNIX deployment environments enable the developer to focus on the business problem to be solved, and not on the technical details of the various deployment platforms. This is an especially important issue with the legacy Bull DPS7 environment where experienced staff is increasingly difficult to find and retain.

“Using Delta’s products and services guarantees that our applications are independent of the deployment platform and database product – a critical success factor for GEQ.”

*Alberto
Moreira
Systems
Development
Manager, GEQ*

DELTA SOFTWARE TECHNOLOGY

Delta Software Technology is a specialist for generative development tools that automate the modernisation, integration, development and maintenance of individual IT applications.

We understand the enterprise IT as a living organism that is continuously changing. Our automated solutions help you to quickly and safely adapt your applications to new business requirements, architectures, technologies and technical infrastructures.

Delta has a more than 30-year track record of successfully delivering advanced software technology to Europe's leading organisations, including AMB Generali, ArcelorMittal, Deutsche Telekom, Hüttenwerke Krupp Mannesmann, Gothaer Versicherungen, La Poste, RDW, Suva and UBS.

AMELIO® Modernization Platform™

The tailor-made factory for the modernisation of large IT applications: 100% automatically and that's why it is safe, reliable and error-free.

SCORE® Adaptive Bridges™

Intelligent service enablement for the reuse of proven applications with modern technologies: flexible, profitable and non-invasive.

SCORE® Data Architecture Integration™

Data as real business services: fast, easy and independent of data architectures and management systems.

SCOUT2™ Development Platform

Optimized and integrated development processes across all software components, tools and platforms: Stop the "fight against the infrastructure".

ADSplus™ Application Development

Platform-independent development for future-proof back-end applications.

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