

# TREETIPS

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## ADABAS-to-RDBMS Real World Series

(Part Two of Several) By Joseph Brady and Dan Sycalik

This is the second installment in a continuing series of articles featuring **tRelational** and **Data Propagation System (DPS)**, TSI's ADABAS-to-RDBMS product implementation, in several "real world" environments.

**tRelational** auto-generates complete RDBMS schema from existing ADABAS files and allows for easy mapping of ADABAS fields to already existing data warehouse or ERP schema. After **tRelational** does the mapping, **DPS** can then materialize (initially load) and propagate (subsequently keep synchronized) the ADABAS data into the RDBMS without requiring direct access to ADABAS.

The **Miami University, Oxford Ohio (MU)** was engaged in a departure from the IBM mainframe platform. MU released a

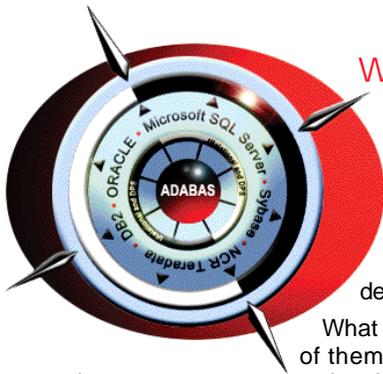
Request For Proposal (RFP) for the ADABAS to ORACLE Conversion – Alumni Database. TSI responded to the bid and was awarded a service contract to perform the conversion.

The following is a recent discussion between **William Custer**, MU Project Manager, and **Daniel Sycalik**, TSI Project Manager.

**Bill, can you tell us a little about Miami University?**

We are a public university with a large main campus, two regional campuses, and a campus in Luxembourg. In all, there are about 16,000 students. Our origins in 1809 date

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Wherever you point your ADABAS data, only one product set can easily help you get it there.

Treehouse Software's Data Migration Products are intended for Software AG customers expressing a need to "migrate" data from Software AG's ADABAS database system to other relational database systems, such as ORACLE, DB2, Sybase, Informix, Microsoft SQL Server, and NCR Teradata. These unique TSI products have little competition, except for expensive and time-consuming "manual approaches", which involve development and maintenance of data extraction programs and excessive computer usage.

What some "competitors" do is generate NATURAL extract programs -- potentially hundreds of them. This is fine if you want to keep lots of NATURAL programmers employed doing maintenance on programs that they didn't write in the first place, or re-generating extract programs every time something changes. These programmers can write NATURAL programs to read ADABAS files and output masses of data, which can be anywhere from very inefficient to prohibitively inefficient. The typical site that uses **tRelational** and **Data Propagation System (DPS)** for migrations knows that this kind of approach can take many hours to do the appropriate migration of data. They also realize that they would have to do it daily or hourly, making this is an unrealistic approach.

**A solution? Hardly. Similar? Hardly.**

**tRelational** and **DPS** work together to form the ONLY complete ADABAS-to-RDBMS data migration solution on the market that efficiently and effectively migrates data from ADABAS to RDBMS-based Internet/Intranet/ERP/Data Warehouse applications.



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# Editor's Sproutings by Joseph Brady

## Demo TSI Products On-line

Contact [sales@treehouse.com](mailto:sales@treehouse.com) to set up a live, on-line demonstration of any TSI product. All you need is an Internet connection and a current Web browser (Netscape, Internet Explorer, etc.) to see TSI products in action right on your PC screen.

## Find out the Latest on TSI Products

To find out about current versions of TSI products, compatibility (operating systems, languages, etc.), and support information for all of our products, view the TSI Product Status Matrix on-line at [www.treehouse.com/prodstatus.html](http://www.treehouse.com/prodstatus.html).



As interest in TSI products grows worldwide, there has been an increased need for us to get out and about. We have made site visits not only to give product demos, but also to provide training for new customers.

Over the past few months, TSI representatives have visited sites in Canada, Germany, Finland, Florida, Colorado, New York, North Carolina, Texas, Illinois, Rhode Island, West Virginia, Pennsylvania, Washington, and California. TSI President **George Szakach** and **Dan Vimont**, TSI Product Manager, and **Hans-Peter Will**, TSI

European Technical Representative, presented the Treehouse ADABAS-to-RDBMS solution at the Oracle Migration Day in Germany. **Mitch Doricich**, TSI Sales Manager, and **Dan Sycalik**, TSI Project Manager, attended the SAG "Experience 2001" in Florida, and Mitch and George attended the 2nd Annual Florida Community College Software Consortium (FCCSC) in Florida, where TSI was a sponsor of the event. TSI representatives will be giving product demonstrations at the upcoming Oracle Migration Tour in Germany, as well.

## Attendees Give TSI Training Rave Reviews

TSI Project Manager, **Daniel Sycalik** has been busy over the past few months visiting sites to provide **tRelational** and **DPS** training. Dan's most recent training session was at the State of Washington Department of Social and Health Service (DSHS). In attendance from the DSHS were **Kelly Ann Landers**, **Duane Gallaher**, and **Mike McAllister**.

After the session, Dan received some nice feedback via e-mail from the attendees:

### Kelly Ann Landers:

*"I was satisfied with the training I received from Dan. I thought he did a fine job covering the material that was listed on the syllabus. He asked for feedback and input on topics we were learning and was sensitive to the differing skill levels in the group. Dan gave thorough explanations and made sure he fully answered our questions."*

### Mike McAllister:

*"I thought the training was great. Dan had a good syllabus for the class and covered everything on it. It was wonderful to actually use the product on our own databases. It was probably the best three days of training I have had in a while!"*

### Duane Gallaher:

*"I thought the training was effective, since Dan provided hands-on experience and reference materials (print-outs and good URLs for us to visit).*

*"The training covered a lot of material for the time we had, and we were able to complete the practical exercises. Dan knows the product and how to share what he knows.*

*"It would be great to have another round of training that starts where we left off. I think all of us will have more questions in the next few weeks that we didn't know to ask during this session."*

Congratulations Dan on another successful customer training class!

Whether you need training to get up and running with a newly purchased TSI product, or you need a refresher course on products that have been in use for years, TSI representatives are available to visit your site to conduct classes. Who knows, there may be useful features that you are unaware of, or maybe you haven't been using to their full potential. Just contact us and we'll make arrangements for a training session.

## TREETIPS

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## ADABAS-to-RDBMS Real World Series (continued from page 1)

back to the Northwest Ordinance. MU made the top 100 in ZDNet's Ultimate College Guide list of the Most Wired Campuses last year.

### Bill, can you describe the ADABAS to ORACLE - Alumni Conversion project?

The Alumni Conversion project was part of a larger Y2K conversion effort. Several mission critical business applications were not Y2K compliant. To meet our deadlines, we purchased UNIX/ORACLE based software. The plan called for the elimination of our IBM mainframe and shifted the cost savings to our UNIX platforms. Our Alumni system was one of several systems that were removed from the IBM mainframe.

### What motivated MU to distribute the RFP for the ADABAS to ORACLE - Alumni Conversion?

We considered doing the conversion in-house, but two factors influenced us to do the RFP. First, key personnel that we needed to convert the Alumni data in-house were also the key personnel on other parts of our Y2K project. Second, we liked the idea of purchasing a proven methodology; we thought it would reduce the possibility of error.

### What alternative solutions did you consider for the ADABAS conversion effort?

We considered converting the data in-house, and we considered other vendors.

### What were the primary factor(s) that prompted MU to select Treehouse's services?

We had followed Treehouse Software as a company for some years through SAG conferences and believed them to be significant and reputable players in that market. We also had experience with other Treehouse products. A primary

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### MU "Project Scope"

Miami University has approximately 40 ADABAS files residing on an MVS Platform that need to be converted to ORACLE 7.3 format on a UNIX AIX platform. The University is seeking a fixed bid to do this conversion work. The following will be included in the work:

- **Install and configure the conversion routines:** **tRelational** and **DPS** will be installed on the Client platform including standardized routines to process and convert ADABAS data.
- **Verify that the FDTs agree with the DDMs:** **tRelational** provides for the capture of PREDICT and FDT definitions and resolution of discrepancies. The implemented files are the basis for the explicit ADABAS field to ORACLE column mapping.
- **Check PE/MU counts/occurrences between FDT and DDM and resolve discrepancy with customer:** **tRelational** provides for statistical data analysis of MUs, PEs, candidate VARCHAR columns and descriptors. These statistics provide for improved modeling of the ADABAS data. The analysis processing is the only direct access to the ADABAS Data and Associator with read-only access.
- **ORACLE column names are to come from the DDMs:** **tRelational** provides for the automatic generation of tables based on the ADABAS file structures. The column names are based on the ADABAS field names. If required, **tRelational** provides for standard ADABAS-to-RDBMS naming conversion.
- **Convert each PE or MU into a separate ORACLE table with primary/secondary key relationships to the main table:** **tRelational's** automatic generation prompts for primary key column(s) and generates a child table for each MU and PE with a Foreign Key relationship to the parent table. The automatic generation may also generate a Primary Key to the child table(s) by adding a new **DPS** sequence column based on the MU or PE occurrence value.
- **Convert date formats to a format suitable to ORACLE.** ADABAS data has several different date formats including: (a8), (n8), (a4), (n4), and ADABAS date format: **tRelational** supports date mask entry for ADABAS fields that are not NATURAL date datatypes. **DPS** may be customized by creating an External Transformation Routine (ETR) to process non standard date values and **tRelational** enables mapping ETRs to ADABAS source field(s).
- **Convert data types to a format suitable to ORACLE:** **tRelational** performs automatic conversion of ADABAS datatypes to ORACLE datatypes. Handling of null values will be agreed upon. **tRelational/DPS** supports three options for NULL processing: null when null, null when empty and never consider null.
- **Several ADABAS files contain approximately 10 logical tables each with its own DDM. Vendor is to separate each logical file into a separate ORACLE table:** **tRelational** provides automatic generation of table(s) based on user views and/or based on grouped fields.
- **Generate ORACLE keys from existing ADABAS data fields where possible with uniqueness:** **tRelational** provides for statistical analysis for Descriptors, including Super Descriptors, for uniqueness. If the data does not represent a unique primary key, the ADABAS ISN may be selected as the primary key.
- **FTP the load file to UNIX AIX:** **tRelational** generates the ORACLE Data Definition Language (DDL) to FTP to the target platform to create the table structures including Primary Key, Foreign Key and column not null constraints. **DPS** generates two output datasets to FTP to the target platform, the load data and the ORACLE SQL Load control statements. The load data is tab delimited to optimize space requirements.
- **Load data to ORACLE 7.3.4 tables on Unix AIX:** Refer to prior bullet.
- **Verify that the data in the resulting ORACLE tables matches the data in the original ADABAS files:** **DPS** provides summary statistics by table that may be verified against the SQL load log statistics.
- **Remote access will be provided for the vendor to run jobs:** Remote access will be required for the mainframe, ADABAS/NATURAL and TSO (ISPF) to perform the modeling, mapping, analysis and to execute the **DPS** Materialization jobstreams. Remote access will be required to the AIX platform to perform the ORACLE load functions.

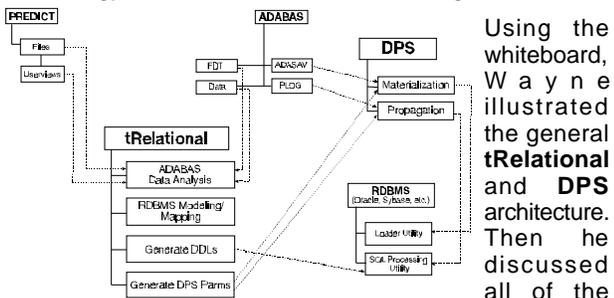
## Piloting tRelational and DPS by Wayne Lashley and Joseph Brady

The following is an example of a pilot project for a client evaluating **tRelational** and **DPS** for the migration of ADABAS data to an RDBMS. This particular example is for a large University using Microsoft SQL Server to host its data warehouse. **Wayne Lashley**, Senior TSI Technical Representative, was on hand to do the project.

Wayne started off by verifying the install. The DBA had already gone about implementing a couple of files in **tRelational** and had used TRAsTatus (a Windows-based monitoring/logging application supplied with **tRelationalPC**) to check the Treehouse Remote Access (TRA) link between **tRelationalPC** and the mainframe. All in all, things were in great shape from the outset. The products were installed to run in a specially designated database environment used for product testing and evaluation. The version of NATURAL used for this project was 3.1.4.

Wayne took a look at the ADAREPs (reports describing ADABAS file contents) for the files that the DBA had intended to use for the project and implemented all of these files (i.e., imported the PREDICT and FDT descriptions into **tRelational**). For several of the newly-implemented files, Wayne ran **tRelational**'s file analysis functions and reviewed the results. This was all accomplished within the first hour.

Wayne then joined management staff responsible for database administration, technical infrastructure, and technology architecture in a kickoff meeting.



objectives of the project and the files that they would be working with. This discussion resulted in a change of the focus of the pilot project. The initial plan would have only demonstrated materialization, not propagation. One of the attendees pointed out that the primary value of **tRelational** and **DPS** for the University would be in propagation, so Wayne chose six different ADABAS files. With these files, Wayne could do a materialization followed by a propagation, after running a batch update job provided by one of the development staff.

After the meeting, Wayne implemented the six new files and performed analysis on each. Reviewing the analyses in detail, Wayne discussed the implications of various figures, then moved on to auto-generating SQL Server tables based on the ADABAS files. Because there were a number of MUs and PEs involved (which become “child tables” in the RDBMS schema), the resulting data model contained about 28 tables. Wayne proceeded to run GENDPS and GENDDL (**tRelational** batch functions generating **DPS** parameters and RDBMS DDL—Data Definition Language, respectively). The DBA created an

ADASAV backup and Wayne ran a **DPS** materialization for the entire data model. The files ranged in size from a few tens of thousands of records to over 500,000 records.

Wayne elected to run DPSSPLIT (a **DPS** utility that splits the materialization output into table-specific files -- **see next page**) on the mainframe and ftped the split files to a PC (rather than to the SQL Server box).

The DBA was an expert in use of SQL Server Enterprise Manager, and she set up the “job” to run the loads for all 28 tables. She had not used the control-file method previously (instead, she was used to mapping fixed-length records by hand) and was very pleased by the way it could be set up using Enterprise Manager in conjunction with the control and data files produced by **DPS**. The load “job” ran flawlessly in about 25 minutes. Wayne then did some quick queries and verified that the tables were loaded correctly.

In consultation with one of the application’s developers, Wayne prepared and executed an update job to generate some PLOG transactions for the files he had materialized (the DBA flipped the PLOG before and after), ran a **DPS** propagation, and loaded the results by executing the generated SQL in Query Analyzer. Everything worked without a hitch, and, in no time at all, Wayne had a fully materialized and propagated SQL Server database.

Later, Wayne started looking at the TSI-supplied **tRelational** “metadata” model. The University has a small Web application querying various custom tables that inform end users about the source and currency of various data warehouse tables and columns. The DBA was very interested in seeing how she might be able to do something similar with materialized TREDICT and TRETRANS files.

Wayne loaded up the model using the TRELOAD utility, backed up the two **tRelational** files, and did a materialization. The DBA viewed this metadata capability as a good selling point.

**tRelational** maintains its metadata in two ADABAS files, TREDICT and TRETRANS. TSI can provide a **tRelational** data model that can be used to materialize (and subsequently propagate, as required) this metadata using **DPS**. This makes your ADABAS-to-RDBMS metadata available directly in the RDBMS for queries, analysis, and metadata applications!

With some extra time on their hands, they went back to the original set of files intended for the pilot, auto-generated a data model and ran a **DPS** materialization, but Wayne did not take the time to set up and run the load. Instead, the DBA created an Esperant application to demonstrate the results of materialization and propagation for the benefit of the management team.

In the wrap-up meeting, Wayne did a whiteboard talk about what he had accomplished, and the DBA demonstrated her Esperant application. The feedback was quite positive and everyone considered the project to have been very successful. A key to this success was the involvement of the right staff who had both the knowledge and the authority to complete all the necessary tasks. ●

# ADABAS-to-RDBMS Real World Series (continued from page 3)

consideration was the Treehouse tool set that would enforce standard rules and methodology. We found their staff to be knowledgeable and responsive to our technical questions.

## How does this conversion project affect your current ORACLE systems?

The purpose of the conversion was to load our alumni legacy data to ORACLE and make it available for reporting in ORACLE, where the rest of our data was being loaded. The Treehouse conversion also eased the data load into the new on-line packaged software files in ORACLE.

## What were the largest obstacles in the conversion project?

Our staff was busy working on many projects simultaneously, including the Treehouse conversion project. We scrambled to avoid being a bottleneck for Treehouse.

## How much did the tRelational/DPS product solution factor in the deliverables/success of the project?

It was a significant factor in the project. It provided consistent rules and methodology. We had data in a format we did not fully understand, and the tRelational/DPS product set allowed us to fix our mistaken assumptions and reprocess the data quickly and accurately. It also discovered vendor encryption routines that needed to be decrypted.

## In your opinion, how much did TSI contribute to meeting your project goals?

Hiring Treehouse to convert our alumni data was important to the overall success of our Y2K project because it allowed our staff to focus on other tasks, yet be confident that our data would be processed correctly.

## Were you satisfied with the TSI services?

Very satisfied. I would recommend Treehouse to others. They understand the nuances of data. We found the staff knowledgeable in data formats and versatile in navigating our environment with a minimum of involvement by our staff.

## TSI Overview of the MU Project

TSI provided a response to the RFP with many documented features of the tRelational/DPS solution designed specifically for modeling, mapping and migration of ADABAS data to target RDBMS(s). Upon award, TSI performed the services exclusively with remote access (e.g., e-mail, phone and ISP access to the IBM

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## TREETIP:

### Separation Into Individual Control and Data Files (DPSSPLIT)

An important part of the DPS system architecture is a program called DPSSPLIT, which is used to separate the control and data files into **one control** and **one data** file per table materialized. The control and data files created by the materialization process have a prefix on each record that groups the records by table. DPSSPLIT removes the prefix and writes the record to a file that represents the table.

```

Menu Options View Utilities Compilers Help
-----
DSLIST - Data Sets Matching QA.DEMO
-----
Display Filter View Print Options Help
-----
SDSF OUTPUT DISPLAY DJSSPLIT JOB08047 DSID 4 L
COMMAND INPUT ***>
IEF3761 JOB:DJSSPLIT-STOP 2000228.0804 CPU 0MIN
WR0TE 20 RECORDS TO CTL001 FOR TABLE EMPLOYEE
WR0TE 8 RECORDS TO CTL002 FOR TABLE INCOME
WR0TE 7 RECORDS TO CTL003 FOR TABLE ADDRESS
WR0TE 8 RECORDS TO CTL004 FOR TABLE BONUS
WR0TE 7 RECORDS TO CTL005 FOR TABLE LANG
WR0TE 8 RECORDS TO CTL006 FOR TABLE LEAVE_BO
WR0TE 1107 RECORDS TO MAT001 FOR TABLE EMPLOYEE
WR0TE 3796 RECORDS TO MAT002 FOR TABLE INCOME
WR0TE 2441 RECORDS TO MAT003 FOR TABLE ADDRESS
WR0TE 1206 RECORDS TO MAT004 FOR TABLE BONUS
WR0TE 1613 RECORDS TO MAT005 FOR TABLE LANG
WR0TE 1798 RECORDS TO MAT006 FOR TABLE LEAVE_BO
***** BOTTOM OF DATA *****
PF 1=HELP 2=SPLIT 3=END 4=RETURN 5=
PF 7=UP 8=DOWN 9=SWAP 10=LEFT 11=RIGHT 12=REVERSE

```

DPSSPLIT is a utility program that strips the Table ID and separates each table (rows or control file) into individual files for load processing. DPSSPLIT may execute on the mainframe or target RDBMS platform.

```

Menu Utilities Compilers Help
-----
BROWSE QA.DEMO.MAT001 - Browsed
Command ***> CSR
-----
***** Top
50005800.SIMONE .GUENTER .M.F.520130.JOIGNY.89300
50005500.ALEXANDRE .BRAUN .M.M.550626.ST-ETIENNE.42100
50004900.ALBERT .CAUDAL .M.M.420617.LE BLANC MESNIL.9
50004600.BERNARD .VERDIE .M.M.480811.MILLAU.12100
50004300.MICHELE .GUERIN .M.F.440107.BOULOGNE BILLANCO
50004200.BERNARD .VAUZELLE .S.M.421206.MAMERS.72600
50004100.ROBERT .CHAPUIS .M.M.520904.IVRY SUR SEINE.94
50004000.JEAN .MONTASSIER .M.M.490703.RENNES.35100
50003800.DANIEL .JOUSSELIN .W.M.490228.PERPIGNAN.66000
50006900.PATRICK .BAILLET .S.M.610116.LYS LEZ LAMNOY.59
50007600.JEAN-MARIE .MARX .W.M.490426.PARIS.75003
50003700.LOUIS .D'AGOSTINO .M.M.490126.FONTENAY SOUS BOI
50003500.MARC .LEROUGE .M.M.510823.ARGENTEUIL.95100
50003300.ANDRE .GRUMBACH .M.M.480320.STRASBOURG.67000
F1=Help F3=Exit F5=RFind F12=Cancel
-----
Display Filter View Print Options Help
-----
SDSF STATUS DISPLAY ALL CLASSES LINE 1-3 (3)

```

Example of Materialization data file from Split.

```

Menu Utilities Compilers Help
-----
BROWSE QA.DEMO.CTL001 Data Set - Browsed
Command ***>
-----
***** Top of Data
GETLONG(DRNO) VALUE)
UNRECOVERABLE LOAD DATA
TABLE EMPLOYEE-FILE
FIELDS TERMINATED BY ' '
TRAILING NULLCOLS
(PERSONNEL_ID CHAR,
FIRST_NAME CHAR,
NAME CHAR,
MIDDLE_NAME CHAR,
MAR_STAT CHAR,
SEX CHAR,
BIRTH CHAR,
CITY CHAR,
POST_CODE CHAR,
COUNTRY CHAR,
AREA_CODE CHAR,
PHONE CHAR,
DEPT CHAR,
F1=Help F3=Exit F5=RFind F12=Cancel

```

Example of SQL Control File from DPSSPLIT. Note the ORACLE optional Unrecoverable Load that was specified in tRelational.

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Mainframe and AIX platforms).

MU's RFP stipulated the following: The ADABAS files will be converted in three groups, corresponding to List A, List B, List C. The 'final data extraction' for each ADABAS file is the extraction that begins after updates to those files have been permanently discontinued. A 'preliminary data extraction' is the extraction that begins before updates to those files have been discontinued. Both the preliminary and final data extractions will be of all records in the files. A 'proof of concept' involves a data extraction of a data sample (typically 1000 records) rather than the whole file, plus a load to ORACLE.

**tRelational** File Implementation was performed to capture the PREDICT and physical file definitions. TSI executed the Statistical Data Analysis to review the source ADABAS data structures. The analysis information provided an understanding of the source data and early identification of possible modeling or data migration issues.

TSI created one **tRelational** model for each project phase (file list), and utilized **tRelational** Autogen to generate the ORACLE Schema with the ADABAS-to-RDBMS mapping. Each model was modified as required to account for specific client data requirements.

**tRelational** GENDDL and GENDPS functions were executed to create the ORACLE DDL and the **DPS** Parameter sets. TSI completed an end-to-end 'pilot' **DPS** Materialization with a file extract limit of 1,000 records per source file for each model, then created the ORACLE tables and loaded the extract data on the target AIX platform and confirmed processing summary counts for the Extract Transformation and Load (ETL) verification.

Upon verification of each pilot, TSI performed the 'preliminary data extraction' for full file **DPS** Materialization. This provided normalized ORACLE tables to facilitate the design, development, and testing of the subsequent load scripts into the ERP (not performed by TSI).

Upon notification of readiness for the 'final data extraction', TSI executed the final **DPS** Materialization and load processing.

## Editors Note:

The MU project required conversion of about 41 ADABAS files with approximately 1600 fields for 6.7 million records to about 224 ORACLE tables with approximately 16 million rows.

TSI met all milestone objectives and completed the end-to-end ETL process with minimum time requirements from the MU staff.

Interest in **tRelational** and **DPS** is increasing worldwide, and so is our customer base. We'll be publishing customer case studies and interviews as fast as we can get them. ●

## Ease the Impact of Change with OnDiscovery

Modern Software Technologies (MOST) is a services and tool vendor in the NATURAL/ADABAS and Cobol market. MOST headquarters and development center are in Tel Aviv, with USA sales and support located in Rutherford, NJ. MOST's tools including **OnTarget** for the automatic analysis and automatic conversion of NATURAL and/or Cobol/ADABAS applications to NATURAL and/or Cobol/DB2 and **OnDiscovery**, which is described below:

Business needs demand more changes to your NATURAL/ADABAS systems quicker. *Time to Market* is a critical issue affecting the bottom line. When your company is constrained by need to change the way you do business, **OnDiscovery** can:

- Change Applications Automatically
- Provide an accurate and speedy renovation path

**OnDiscovery** is a great asset for ADABAS/NATURAL organizations, from the requirement analysis through coding phases of maintenance projects. **OnDiscovery** lets you deliver accurate projects on time, in budget and with fewer resources.

**OnDiscovery** provides capabilities that allow users to quickly take advantage of the information that is available through various repositories. **OnDiscovery** provides the following features:

- Cross-referencing facilities
- Extended application-wide search, verification and analysis capabilities
- Hierarchical structure (explosion/implosion trees) of all Natural component
- Process maps (tracing execution paths within an application)
- Impact Analysis of code changes
- Automated code renovation
- Extended reporting options
- Workflow auditing

**OnDiscovery** provides assistance to analysts and designers. It analyses and searches large numbers of NATURAL components. Once the repositories are loaded (accomplished quickly and easily), the analyst/designer can then search the repository for variables and create execution trees. The execution trees have an unlimited number of levels. The variable impact mechanism not only finds references to the named variable, but also all other impacted variables that are used in move and call statements. The application analyst and the programmer therefore, have a complete view of a variable through all its transformations. Additionally, **OnDiscovery** highlights the lines of code that reference the variable and all its extensions. The impact mechanisms can be modified as needed and also used to exclude components that are deemed out of scope.

If you are interested in **OnDiscovery** or in similar capabilities for your Cobol/ADABAS applications, contact TSI.

## Editor's Note:

This **OnTarget** and **OnDiscovery** article was included unedited, as supplied by MOST, and does not imply support or endorsement by Treehouse Software, Inc., its employees, or affiliates.



# TREEHIPS



Treehouse Software products include:

**Relational Products:**

tRelational - ADABAS data analysis, relational modeling, and mapping tool; **DPS** parameter generator

tRelationalPC - Windows-based graphical interface to make the tasks of modeling and mapping even simpler.

Treehouse Remote Access (TRA) - Middleware that allows **tRelationalPC** to communicate with **tRelational** on the mainframe.

DPS - ADABAS to RDBMS data materialization, replication, and propagation software

**UNIX Products:**

SEDIT - XEDIT and ISPF/PDF compatible editor for UNIX and Windows

S/REXX - REXX-compatible language for UNIX and Windows

S/REXX Debugger - Optional graphical debugger for **S/REXX** programs

**Software AG Related Products:**

ADAREORG - File reorganization tool for ADABAS

ADASTRIP - Data extraction utility for ADABAS

\* AUDITRE - Generalized ADABAS auditing facility

\* AUTOLOADER - ADABAS file automatic unload/reload/dump utility

\* CHART for NATURAL - NATURAL application analysis and documentation tool

DBAUDIT - Data integrity verification utility for ADABAS

\* N2O - NATURAL application change management system

\* N2O/3GL - 3GL support within **N2O** for PANVALET, LIBRARIAN, ENDEVOR, and PDSs

PEEK - ADABAS file browsing utility

\* PROFILER for NATURAL - NATURAL quality assurance and testing tool

QDUMP - Incremental backup utility for ADABAS

RACE - NATURAL performance enhancer and "Redundant ADABAS Call Eliminator"

\* SECURITRE - ADABAS and NATURAL security interface to RACF, ACF2, and TOP SECRET

\* TRIM - ADABAS and NATURAL performance monitor

\* Indicates TSI Products that are marketed for TSI by international affiliates

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