ENABLING THE FUTURE

Natural / Adabas

Migration Solutions

Background

FBD Associates Inc. (FBDA) is a software tools company specializing in the delivery of high value-added solutions for Natural/Adabas users. The company's key technologies are:

- **NatMiner™** – a web and repository based toolset for analysis and application mining of Natural/Adabas applications.

- **JavNat™** – a toolset for highly automated transformation of a Natural/Adabas application to a functionally equivalent Java/Oracle implementation.

The FBDA tools are built on robust parsing and repository technologies whose initial development was initiated in 1990. The technologies were originally developed to support Natural to Natural migrations (Natural 1.2 to 2.1 for example) and subsequently for Year 2000 analysis. The parsing technology in particular has been used to process over 200 MLOC of customer source code from all of the mainstream Natural dialects.

The general capabilities and architecture of the NatMiner tools are described herein.

A separate brochure describing the JavNat tools is available for download from www.fbda.ca.

NatMiner Process

NatMiner analysis is normally provided using the Application Service Provider (ASP) service model. This ASP model allows for a low cost delivery to the customer with minimal installation and training.

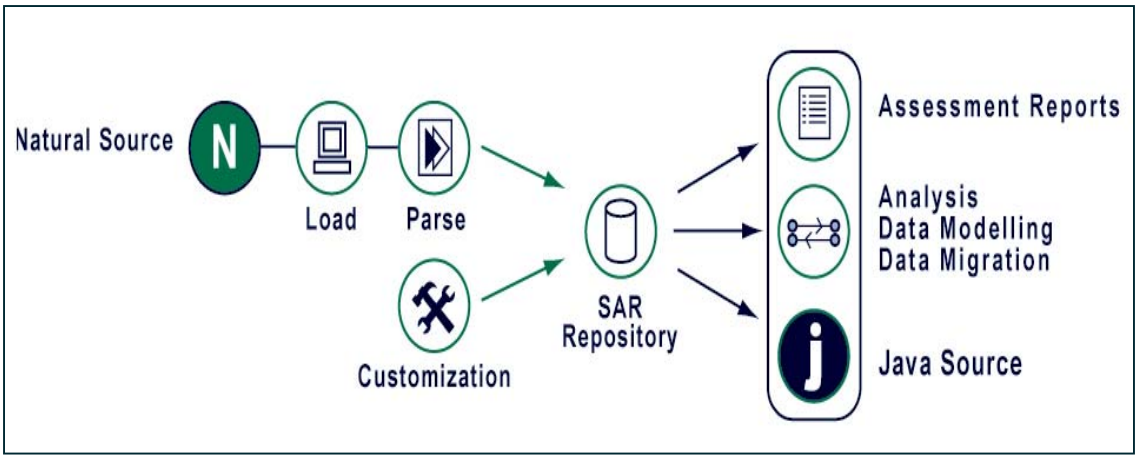
Customer application source code is typically provided to FBDA via ftp in SYSTRANS format. The SYSTRANS files are decoded by FBDA, stored in a directory structure, and provided as input to the NatMiner parser.

The NatMiner parser uses a BNF grammar model for each of the major Natural dialects to parse the Natural source code, including the Adabas FDTs, in detail. The output of the parser is stored in an Oracle based Syntax Analysis Repository (SAR).

The resulting SAR database contains sufficient detailed data to support re-generation of the source code without reference to the original source text. All subsequent processing, reporting and query generation is then driven from the SAR database.

After the SAR database has been loaded a comprehensive series of reports are generated and produced in HTML format to support delivery to the customer via an FBDA web server and a customer client web browser. The reports allow navigation via hyperlinks to review the SAR data and conduct detailed analysis tasks.

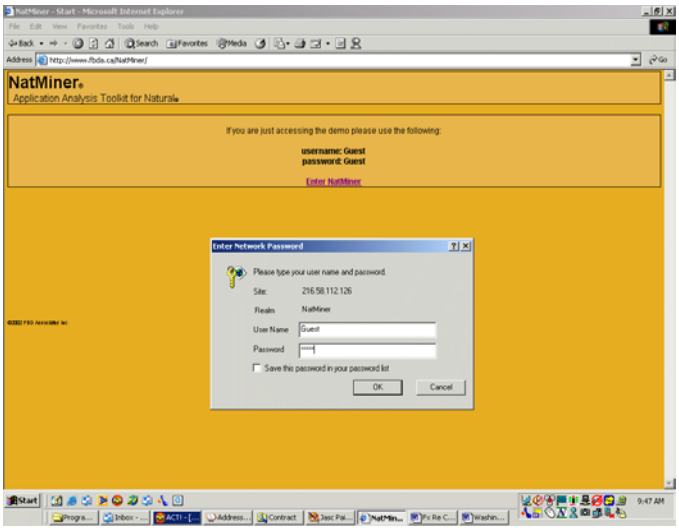
The NatMiner processing cycle is illustrated in below.



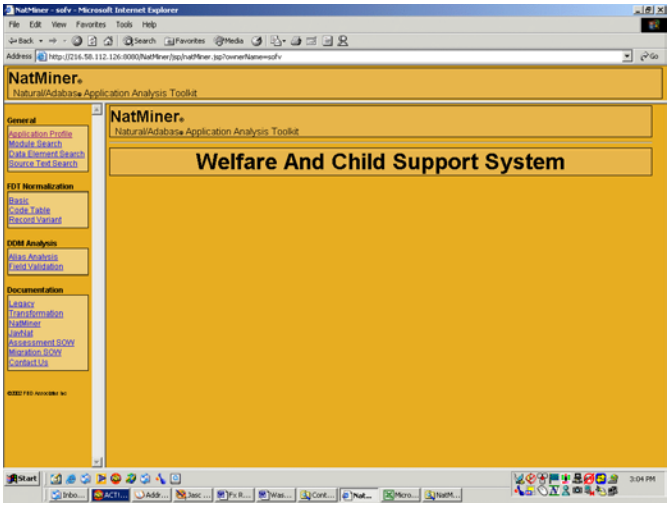
The NatMiner capabilities described herein are a subset of the full capabilities. The capabilities will continue to evolve over time. Readers are encouraged to visit our web site to obtain the most recent information.

NatMiner Analysis Operations

When the NatMiner processing has been completed the customer can log on to the FBDA web server using a secure connection as shown below: (Note: a on-line demo is available at www.fbda.ca using User Name / Password = Guest / Guest).



When the logon is completed the user is presented with the NatMiner opening screen as shown below and can then navigate the reports and use the analysis capabilities.



In this case we have the results for the “Welfare and Child Support System” – a medium scale public domain Natural/Adabas application used by a number of US state governments. In the browser left frame you will see a series of links that lead to more detailed reports, various analysis capabilities, and downloadable reference documentation. Extensive HTML links facilitate user navigation amongst the reports.

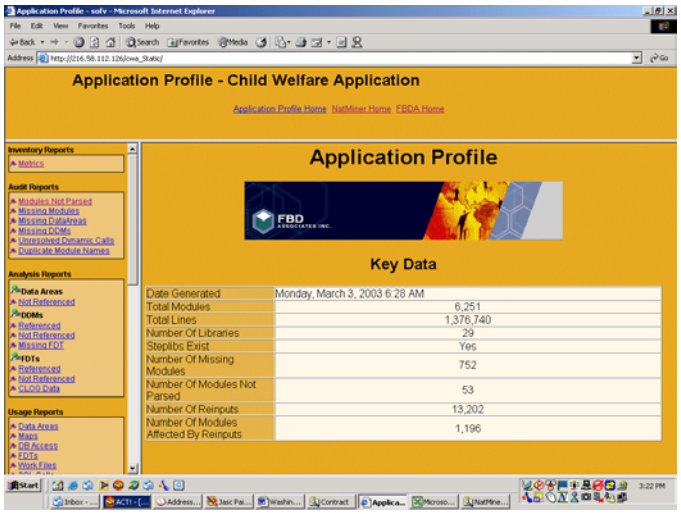
The links are grouped as follows:

- **General –** a group that provides access to the following reports and analysis tools:

    - **Application Portfolio –** provides an extensive array of static HTML reports generated from the source code parse data contained in the SAR database.

The Application Profile start page provides an immediate overview of the application by presenting the key data such as line and module counts, missing module and parse failure counts, and similar information. This allows the user to get a quick impression of the application and the integrity of the SAR database.

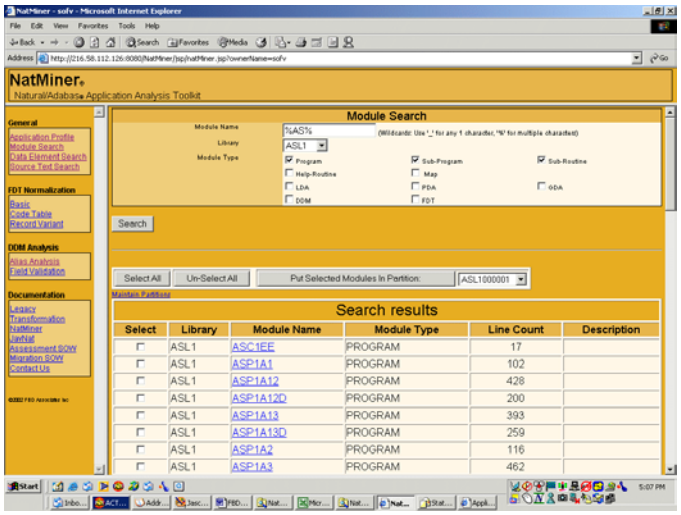
The left frame provides links to the detailed reports by functional area.



    - **Module Search –** provides a query template to allow a search of the SAR database by module name and type against a library or set of libraries.

The Module Search screen allows the user to enter a module name or name fragment including wild card characters and then specify the module type or types to be returned as well as the libraries to be searched.

The query is executed against the SAR database and the result set returned to the client browser.



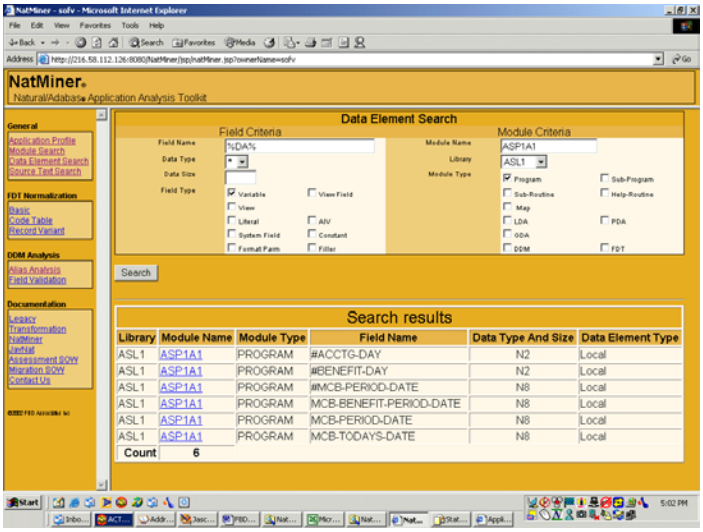
The Module Search screen is a standard query. However custom queries and screens can be easily developed by FBDA or the customer. The result sets can also be extracted to a csv file for import to spreadsheet applications for further analysis.

- **Data Element Search -** provides a query template to allow a search of the SAR database using specified field and module criteria.

The Data Element Search screen allows the user to specify the field characteristics such as name and type as well as data type and size.

This screen also allows the user to specify the module (s) to be searched as well as module characteristics such as type and library.

Query results are returned to the client browser

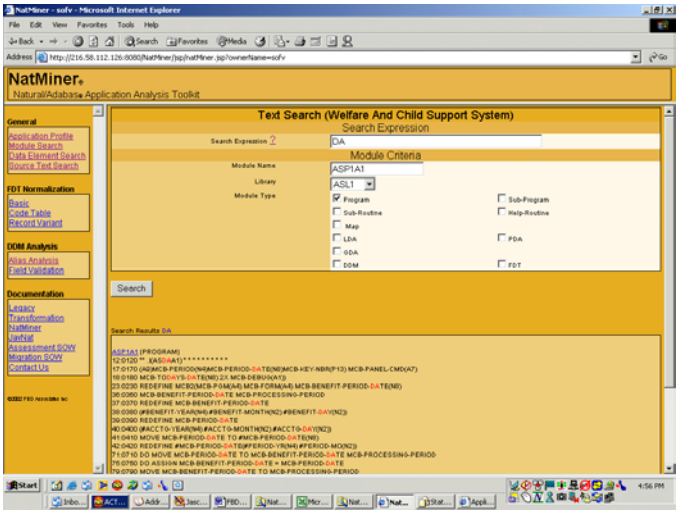


- **Text Search -** provides a query template to facilitate a regular expression text search of the application.

The Text Search screen allows the user to specify a search string as well as the search target module criteria such as module name and type.

The screen implements a regular expression search and a help screen for special search expressions is provided.

The search results are returned to the client browser as shown.



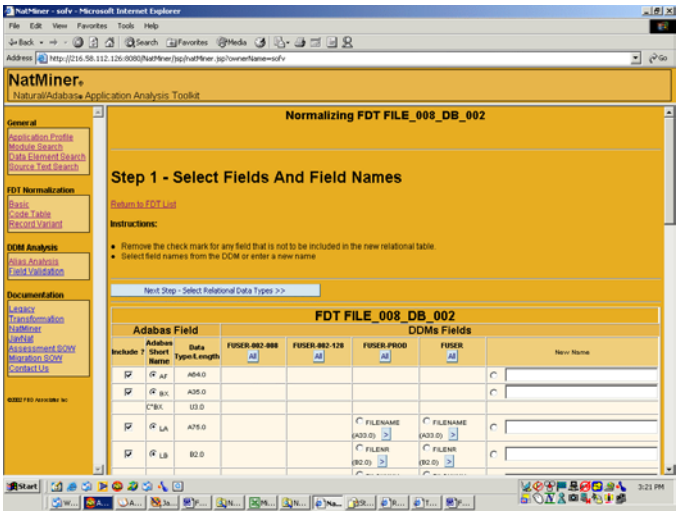
- **FDT Normalization –** this group provides access to a number of capabilities related to FDT normalization and analysis including:

    - **Basic Normalization –** implements a normalization of an Adabas FDT to an equivalent Oracle relational schema. The user is presented with a series of browser screens to select an FDT for normalization as well as normalization parameters such as field names and data-types as indicated below.

In FDT Normalization Step 1 the user first selects the Adabas fields to be included in the normalization.

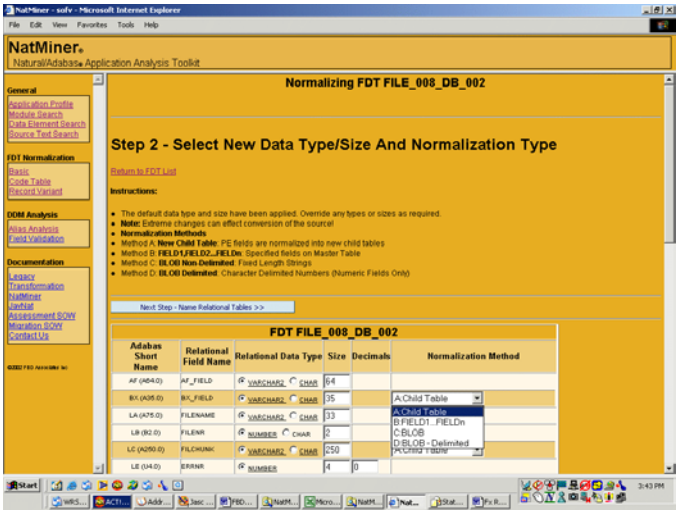
For the selected Adabas fields the user then may choose a field name from one of the DDMs that reference the Adabas field or can enter a new field name.

This approach allows the user to preserve existing familiar field names or create potentially more meaningful field names



In FDT Normalization Step 2 the user can select the relational data-type, size and decimals.

In addition the user can select the normalization strategy for Adabas MU and PE fields from among the four supported strategies as indicated by the drop down list.



Similar screens follow for selection of table names.

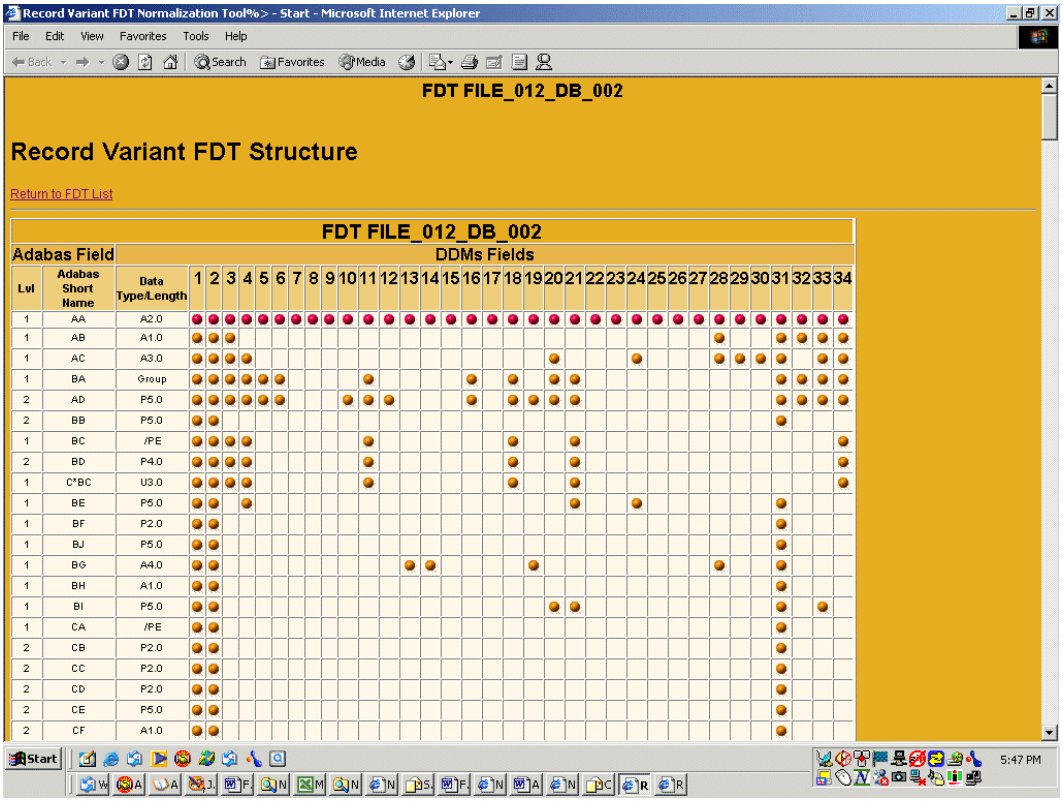
When the user input process is complete the Oracle DDL script is automatically computed and saved to the SAR database for later use in generating the target Oracle database for a migration project. Alternatively the relational schema can then be viewed using tools such as ERWin to provide an analyst with additional insight into the Adabas file design.

- **Code Table Analysis -** database schemas associated with Natural applications are typically non-normalized. In particular, these applications often implement multiple tables within a single physical file. This is a practical consequence of the early Adabas limitations on the number files that could be contained in a single database. This limitation did not prevent the implementation of normalized designs with each entity mapped to a single file or table, but many Adabas designs were forced to implement all tables associated with an application within a single physical file. This complicates the mapping of these structures to relational database designs.

  A special case of multiple tables contained within a single physical database file it the concept of a Table File within an application or sub-system which holds records for a variety entities, sharing a common (Table-ID, Value) key and a mapped Alpha_or_Numeric value expansion. This is a particularly common design idiom in individual legacy applications that are integrated post design.

  Analysis tools to assist with normalization of code table designs are currently in development.

- **Record Variant Analysis –** this provides a graphical view of an FDT and the mapping of DDM fields in cases where there are multiple DDMs referencing an FDT. This analysis can support factoring of a single Adabas file into multiple relational tables based on disjoint DDMs and data usage. A typical record variant presentation is shown below:



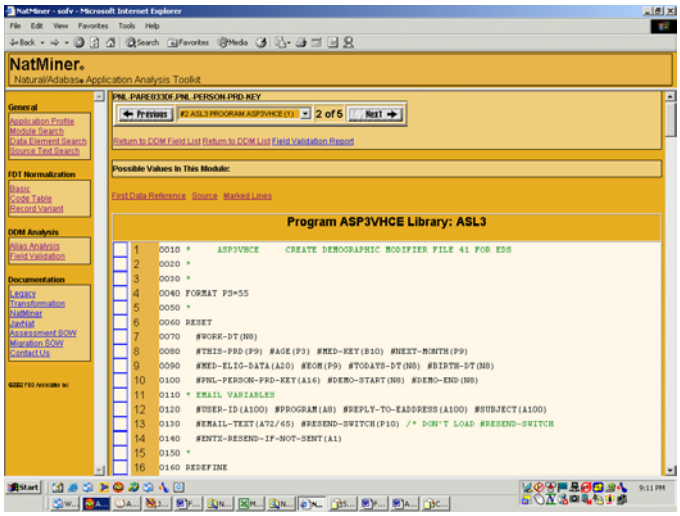
- **DDM Analysis –** this group provides for analysis of the application based on the DDMs as follows:

    - **Alias Analysis –** a feature currently in development to allow for identification of field aliases.

    - **Field Validation –** provides a capability for an analyst to determine and record the suite of values used for field validation. Starting from an individual DDM the analyst can select a particular field and is then provided the following screen:

The analyst can then use this and related screens to review each of the references to the selected field in the source modules and select those of interest by checking in the box provided next to each line.

The analyst would review each module referencing the selected field and mark lines of



After a review of all the modules a consolidated list of selected lines can be reviewed as follows: