

DATABASE PUBLISHING

With FrameMaker & UniMerge

What is UniMerge?

It's a data merging engine that leverages the best features of a database management system and FrameMaker by helping them work together to produce high-quality output.

Applications are Created in FrameMaker

UniMerge uses a **report template**, which is an ordinary FrameMaker document containing intermixed *field names*, UniMerge *commands*, and *static matter*. Paragraph and character tags specify the final format of each data record component. This approach lets you focus on the *appearance* of your reports rather than the *mechanics* of producing them. The report template is merged with the *database extract*.

Here's an example of a simple template for a list of names and addresses. *Field names*, replaced by their *field values* at merge time, are shown in **bold**. UniMerge commands are shown in blue in the Courier font. Comments (preceded by //) are shown in *italics*. An index marker for an alphabetical index is inserted in each name:

```
IF (NOT firstname)//firstname field is empty, so this record must be for a company. Index marker contains "surname"
```

```
^surname
```

```
ELSE IF (NOT mi)//This record is for a person, but the middle initial field is empty. Index marker contains: "surname, firstname"
```

```
^firstname ^surname
```

```
ELSE//This is a person who has a middle initial. Insert a period after the ^mi field. Index marker contains: "surname, ^firstname ^mi."
```

```
^firstname ^mi.^surname
```

```
END
```

```
^street
```

```
^city, ^state ^zip
```

How UniMerge Executes

It executes as a batch process under the Unix or MS-DOS O/S. For example, to merge the template shown at left with a database extract, the following batch command would be executed:

```
UM -single template extract output
```

Where:

-single specifies that all merged records are output to a single file (alternatively, each record could be output to a separate file).

template is the name of the FrameMaker report template file, saved in the Maker Interchange Format (MIF).

extract is the name of the database extract ASCII data file containing the database records that are to be merged with the report template.

output is the name of the merged output file (a **ready-to-print** MIF file, produced by UniMerge, that is openable in FrameMaker).

Execution is fast. In a typical application, the processing rate is around 2000-5000 records per minute on a 266-MHz Pentium platform. An error log can be produced if record errors are found.

Format of the Database Extract

ASCII text data in any of the following formats (all easily produced by most database management systems (DBMSs)):

1. Character-Delimited Fields (the delimiter character can be any printable ASCII character).
2. Fixed-Column (all fields on a single line, with each field having a specified length).
3. Each field on a separate line (i.e., `FieldName:FieldValue`). When this format is used, records can have multiple nested levels of subrecords in repeating groups

Direct database access is also possible (see page 4).

Data Types and Data Formatting

UniMerge handles the following data types, which are declared (and optionally formatted) using the UniMerge FIELD command:

- String (quoted or unquoted)
- Number (real or integer)
- Date
- Time
- Enumerated (i.e., a finite set of code values, each of which equates to a specified text string).

Field values may be formatted in many different ways:

- Specifying the case (Upper, Lower, or Initial Caps) of strings
- Adding characters within strings (e.g., to format social security numbers, telephone numbers, etc.)
- Adding smart quotes to strings
- Truncate string, or find/extract a substring within a string
- Collapsing blank fields
- Specifying the number of decimal digits in numbers
- Specifying a leading zero for numbers less than 1
- Specifying a delimiter between thousands in numbers
- Prefixing a number with a dollar sign
- Prefixing positive or negative numbers with a + or a - sign
- Enclosing a negative number in parentheses
- Replacing the number 0 with text
- Formatting dates and times
- Translating enumerated field values to text strings.

By defining formats with the UniMerge FORMAT command, the same field may be formatted differently in different contexts within the same record.

Derived Fields

Derived fields (created by the UniMerge FIELD command) are computed from database fields, using the following operators:

- Arithmetic (ADD, SUBTRACT, MULTIPLY, DIVIDE)
- Aggregate functions (SUM, AVERAGE, MINIMUM VALUE, MAXIMUM VALUE, FIRST VALUE) performed on the subrecords within a repeating group.

Imported Text and Graphics

Boilerplate Text Fragments

Using the UniMerge FRAGMENT command, you can individually tag text fragments within an external FrameMaker file. The UniMerge INCLUDE command, inserted in the report template, is used to import text fragments into the merged output. This capability can, for instance, be used to construct individualized employee benefit booklets from a Human Resources database. In this case, each employee record generates a complete booklet, assembled from the applicable (database-specified) fragments, with employee-specific field values filled in.

Graphics

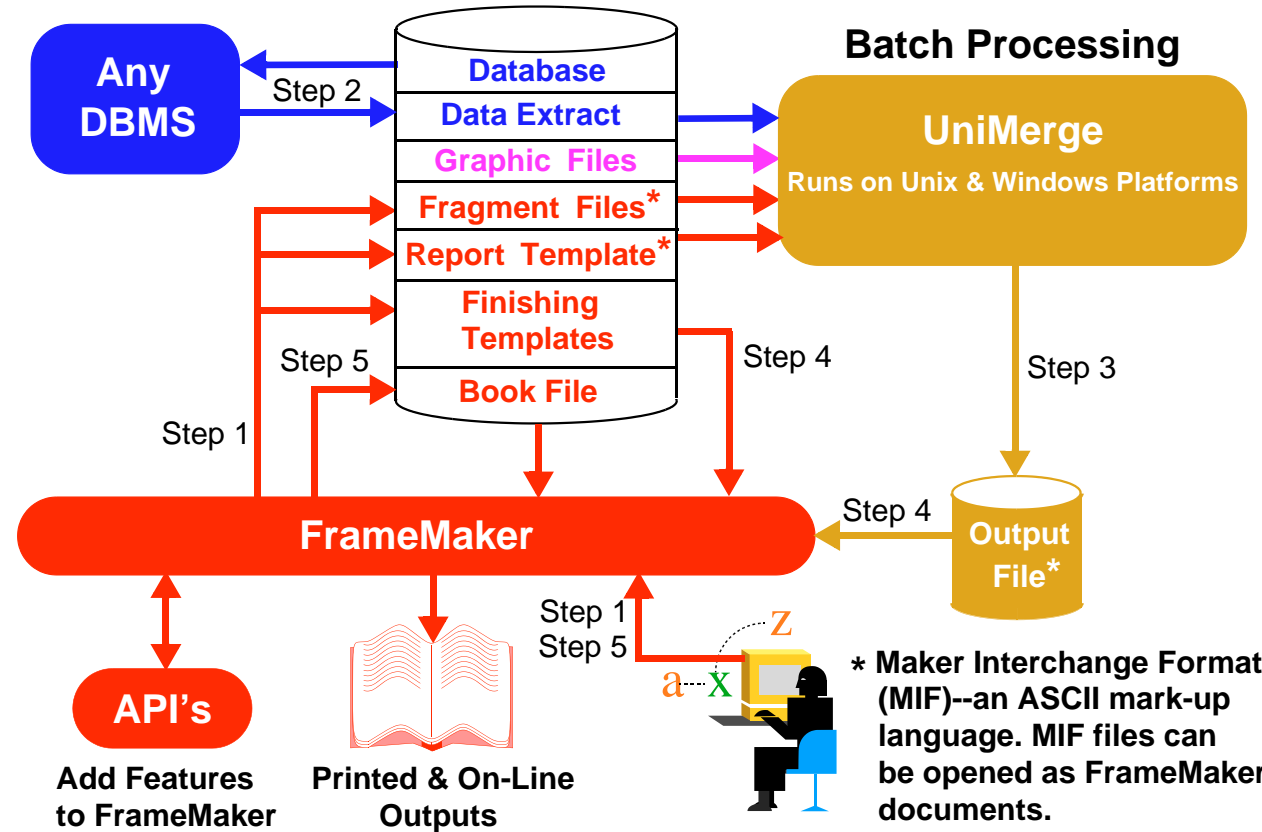
If the database extract includes record fields that specify graphic file-names, those graphics can be imported by reference into the merged output. To accomplish this, the FrameMaker report template must have an anchored frame containing an imported-by-reference “dummy” graphic of the same size and graphic format type as the “real” graphics. The UniMerge MAPFILE command equates the graphic file specified in each record to the “dummy” graphic, and substitutes the “real” graphics for the “dummy” at merge time.

Repeating Groups

Repeating groups (each consisting of a set of subrecords within a primary record) are created by the relational JOIN operator during queries executed on relational databases. An example is line items within a record that creates an invoice. Unlike some other data merging engines, UniMerge can handle multiple nested levels of repeating groups, and provides special commands for processing them. **Repeating groups can, for example, be put into tables.**

Putting It All Together

1. Create Application
2. Query database & produce Data Extract.
3. Merge Data Extract with Rpt. Template to produce output file.
4. Open output file & apply finishing template¹.
5. Create Book File & Generate Indexes & TOC.



No Custom Coding!

1. A finishing template is optional. It allows different formatted outputs to be produced from the same report template.

Using this configuration, Dan Emory & Associates has developed turn-key applications for a number of directories and catalogs, including:

Provider Directories for HMOs • Course Catalogs for Universities • Questionnaires

Luckman's Worldwide Web Yellow Pages (1216 pages)

Membership Directory for American Academy of Ophthalmology (900+ pages)

Other Unimerge Features

Direct Database Access

Oracle, Informix, Sybase, and Progress databases can be accessed directly, eliminating the need to produce a database extract file. UniMerge commands (in the report template or a control file) define the query. UniMerge fetches the query answer directly from the database.

Markers

Field names (replaced by their field values during the data merging operation) can be placed in the text of FrameMaker markers embedded in the report template. These markers can be used for producing telephone-book-style running header/footers, as well as for generating lists and multi-level indexes.

Conditional Processing

One of UniMerge's most powerful features is its ability to merge different contents (i.e., fields, commands, and static text) depending on the content and context of the information in each record. IF/ELSE expressions provide this conditional processing capability (a simple example is shown in the sample template on page 1). These expressions can include intermixed boolean (OR, AND, NOT) and comparison (>, <, >=, <=, =, !=) operators to test for complex conditions. Sub-expressions can be grouped in parentheses. Nested expressions are allowed.

If an expression is TRUE, all contents down to the next ELSE, ELSE IF, or END are merged.

Look-Ahead/Back One Record

The conditional processing capability described above can also compare the value(s) of field(s) in the current record being processed to the value(s) of field(s) in the next or previous record.

Report and System Variables

UniMerge provides a number of system variables. The SET command is used to create report (i.e., user-defined) variables, and to set the value of some system variables. Report variables can be used for many purposes, including setting a variable to the value of a particular field in a particular record context. This value is stored semi-persistently, so that it can be used in the processing of subsequent records.

Control Files

Sometimes you may want to enter a UniMerge command in a report without putting the command in the report template itself. For example, you may want to use the same report template in different circumstances without having to modify it. Control files (ASCII text files) are used for this purpose. UniMerge commands that are not position-dependent can be put in a control file. When you execute UniMerge, you specify which control file to use.

Job Files

In some batch processing applications, you may want to assemble and collate a "packet" that contains more than one report. You may also want to send duplicate copies of a report to different locations. These tasks are accomplished by a job file (an ASCII text file), which provides a way to merge several reports in a single application.

Batch Printing

Opening merged output files in FrameMaker for printing is fine for small jobs, or when you concatenate the entire database extract into a single file, but what if the data merge operation produces a hundred or a thousand output files? Obviously, it's too tedious to open and print each one in FrameMaker. Fortunately, there's a better way when FrameMaker runs on a Unix platform, where **batch printing** is supported by the *fmprint* and *fmbatch* commands.

Batch printing allows documents to be composed and printed with a single command, without requiring any human intervention. UniMerge provides the *\$printaction* system variable for this purpose. A SET command that sets this variable can be placed anywhere in a report template, a control file, or a job file. The print action is executed as soon as each output document is merged. Because the print action may be executed by virtually any program to which you can pass variable arguments, you have almost unlimited control over the way reports are "printed". In fact the print action may not print anything, performing some other useful action instead.

Checking the Report Template for Errors

UniMerge checks for command syntax errors in the report template. A replica of the report template can be produced, in which an error message is inserted at the location of each error.

Examples of Applications I've Developed

Member Directory for Amer. Acad. of Ophthalmology

864 pages containing over 26,000 members worldwide. Geographical listings are by state/city or country/city. A capsule biography (a concatenation of the data in 20 separate fields) is provided for each member, as shown below:

ALABAMA

Crystal City

Doe MD, John C (F 1989) b: Aug 4, 1961 in Tennessee. • *Current Prof Acty*: Private Practice Solo. • *Prac Focus*: Cataract/IOL/Refractive Surgery. • *Hosp Priv*: Eye Foundation Hospital. • *Educ*: MD, 1986, Univ Tennessee. • *Res*: Univ TN Chattanooga, 1987-1990. • *Cert*: ABO, 1991. • *Addr*: 1234 Main St., Ste 112, Crystal City, AL 35223 • *Phone*: (205) 123-4567 • *Fax*: (205) 123-4568 • (ID#01002008)

Each listing has a running header/footer marker for creating telephone-book-style running headers indicating the city/state or city/country in the first and last listings on each left/right page spread. Each member listing also has an index marker for generating an alphabetical listing by last name, including the member's city/state or city/country. An auto-generated Table of Contents lists each state and country in the geographical listings. We produced the 1997/98 & 1998/99 editions.

Luckman's World-Wide Web Yellow Pages

1216 pages with over 10,000 sites in 187 categories. Screen shots are included for some sites. Each listing has markers for generating alphabetical indexes by site title, by keywords, and by rating. A typical listing is shown below. We produced the 1997, 1998, and 1999 editions.

Big Book of Alcoholics Anonymous

<http://www.recovery.org/aa/bigbook/www/index.html>

Not affiliated with Alcoholics Anonymous, this site posts a disclaimer to make clear that this is not the place to learn about AA. It is, however, the place where readers can access the full text of the AA bible, "The Big Book." Written by Bill W, the founder of AA, the book lays down the basic tenets of the 12-step program which became the model for so many self-help groups.

LOAD TIME **13** ORGANIZATION  CONTENT DESIGN 
 FEATURES: Good Links, Frames

What Does It Cost?

Software License

There are several database publishing products in the \$12,000 to \$75,000 range that work with FrameMaker. Given all the features that have been described, you might conclude UniMerge is in that price range. Wrong! A UniMerge license from Refined Reports costs **less than \$700** on a Windows platform, and **less than \$1000** on a Unix platform. Yet UniMerge offers 95% or more of the capabilities provided by the more expensive products.

Application Development

You might also expect application development costs to be higher for a less expensive products. Wrong again! Developing a UniMerge turn-key application (including template design, testing, and documentation) typically takes between 5 and 75 hours, depending on complexity.

How to Contact Refined Reports

Note: I am not affiliated in any way with Refined Reports, but I've been using the product in my practice for the past six years with great success.

You can contact Refined Reports by email at

mmark@progress.com (Michael Mark)

Mention that you heard about UniMerge from Dan Emory.