Abstract

Rapport is a tool for the end users that will permit them to create report specifications and produce reports using an approach that is independent from the host languages or data base managers. This approach offers isolation from fourth generation languages and permits organizations to change their corporate data base manager or 4GL with no impact on the end users i.e., program conversion, etc., since the report specifications are stored in an independent form. Using this method users can access corporate data using a common dialogue independent of the physical data structures i.e., Tape, Relational Data Bases and Fourth Generation Data Bases all appear the same.

The second objective of this system was to develop a computer/user interface that was completely syntax free thus the user would not have to learn even a simple query language. Rapport uses a fill-in-the-blank approach to capture the report specifications and when the reports are run the system decides which language will be generated to support the request. At that point the user has the option to browse the language/program generated serving as an introduction to the language.

This paper, in addition to discussing the benefits of using this approach in managing end user computing, describes the user dialogues using a learn by example method of instruction and introduces the *SAS language as an example of how this approach can be implemented.

A Tool to Manage End User Computing

The role of the management information systems group in most corporations is changing. In the last two decades most programming was done by the MIS group. Recent development in user friendly query and reporting languages has made it possible for user departments to access the corporate data bases and these users now have the responsibility to generate a large portion of the corporate reports. The impact on companies of this shift of computing from MIS to the user departments has not been fully realized. The initial benefits are clear, the users become self-sufficient, which reduces the growing backlog of requests for new systems and reporting on existing systems. The number of programmers developing and maintaining systems in the last decade will be small compared to the number of users that will be involved with this responsibility in the 80's. This fact, combined with the proliferation of end user languages in corporations, may cause serious problems in the future. The job of converting from one data base manager or fourth generation language to another may prove to be a very large or impossible task. The conversion is sometimes necessitated by evolving technology, business requirements etc.

The objective of this paper is to propose a method/tool (Rapport) that will address this problem.

Rapport consists of a user/computer dialogue which remains the same regardless of the fourth generation language or data base manager being used.

By using a single interface as the core, you can serve a large number of users on a number of products with minimum training.

Rapport is an end user tool/method that was designed to enable corporations to set up information centres for a wide spectrum of end users without having to train the users in the various software languages. It serves as a generalized front end for information centre products. The user can use this system to create reports from corporate data with no knowledge or training in the information centre products. It completely eliminates the need to learn a computer language to produce reports from corporate data bases. This system requires little formal training in the traditional sense as you are not required to learn and remember a computer language and its syntax.

The system accomplishes this by displaying screens and prompting you to fill in data relevant to your report requirements.
The system will present you with screens that will enable you to compute new data items, select specific records for a report etc.

You may prepare report specifications and store them in a library for later use. Report specifications may be modified or deleted from your library if no longer required. This is accomplished by the user, independent from the Management Information Systems group.

You may create, modify or delete user data views that are stored in your library. This function is normally done by the System Administrator.

A profile is set up for each user comprised of the user data views he or she is authorized to access and the report specifications that are user created.

Rapport goes beyond existing systems that use natural languages by completely eliminating the need for even a simple language.

This approach offers a simple and powerful method to manage a large portion of corporate reporting.

An Application Generator for End-Users (Rapport)

Rapport was designed to hide the syntax and the complexities of computer languages commonly used by information centers. Rapport will actually write programs in a number of languages as a result of the dialogue with this system.

You will have the option to see the generated programs. This option can serve as a basic training approach for users intending to use the languages directly to obtain more advanced features.

Rapport actually extends the Application Generator concept further by permitting the generation of any number of Data Bases/Languages. This provides for a consistent software environment since both the user departments and MIS can share the same languages or Data Bases.

One of the major considerations in the design of this system was the Ease-Of-Use aspect. For instance, when using the system, you will have all the information necessary to prepare your report specifications. The screen is divided into three parts. The first part (top) is where you enter the information on what you want to do. The second part (middle) is where all the prompting messages appear. It will prompt you on what you want to do. The third part (bottom) will display a dictionary of all the information you will require to prepare this report. With this system you will not have to remember data names, file names, report names. All these will be contained in your dictionary and displayed automatically when required.

A large number of fourth generation languages are currently available for direct use by end users and as end user computing continues to grow a substantial effort will be invested by users developing software. Consequently migration from a fourth generation language or data base system to another system may involve substantial effort and in some cases will be virtually impossible.

The primary objective of Rapport was to offer a degree of independence and portability of the user developed applications thus permitting corporations to switch from one system to another without impacting the user. This approach is similar to the use of data base technology which offers application programmers a degree of independence from the more volatile data sources.

Using Rapport to create and manage the basic corporate reporting will reduce the ongoing maintenance costs by ensuring a consistent level of documentation and ease of maintenance for new (staff turnover) and existing users.

Rapport serves as an insurance policy to enable easy migration of user created application to other software tools.

Data Management Considerations (Rapport)

The successful implementation of this approach is based on good Data Management practices such as good naming conventions to eliminate item names such as "AND", "OR" etc. These are reserved words in most 4GL languages and in certain cases can present problems in migrating to new software.

Rapport will permit generation of update transactions for the Corporate Dictionary in sync when the user creates, modifies or deletes report specifications or data views.

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Rapport consists of a series of screens to capture the report specifications. This user dialogue is composed of Fill-In-The-Blank screens that permit the user to create, modify or delete report specifications.

These specifications are stored in a user library and are totally independent of the actual language that the reports will ultimately be written in.

Another series of menus permit the user to actually run the reports. At this time the system will generate the source code to produce the reports and execute this code. The user will then have the option to browse or print the generated report.

Rapport is composed of (1) a generalized front-end to capture application specifications and (2) a code generator.

The major goal of the software is in the ease in which it can be adapted to the generation of most computer languages.

The migration of user written application from one language to another requires a change in the code generator software if the specific language generator does not exist otherwise it simply requires changing a parameter on one of the screens.

Thus for example the effort of converting 100 users each with twenty report programs for a total of 2,000 report programs is reduced to simply changing

(1) Code Generator (if it does not exist) or
(2) changing one parameter

Rapport can generate logs to enable the monitoring of user reporting or transactions to update the Corporate Dictionary.

Rapport uses only the most commonly used features of a language. Thus this approach is not targeted at addressing all user reporting. The reports managed using this system will be easier to create, maintain and will be available to a larger audience.

APPLICATION GENERATOR FOR END USERS

RAPPORT

Create, Modify, Delete Report Specs.

Run & Browse Reports

SOURCE CODE

TRANSACTION TO UPDATE CORP. DICTIONARY OR USAGE LOG ETC.
Rapport Features

The next series of pages contain typical terminal sessions showing the features of Rapport. The procedure to start the system will depend on your computer shop and will be available from your technical staff. The dialogue will begin with the following screen:

**MAIN MENU**

SELECT AN OPTION

1 - CREATE; MODIFY OR DELETE A REPORT SPECIFICATIONS
2 - RUN A REPORT
3 - LIST ALL DATA DEFINITIONS STORED IN YOUR LIBRARY
4 - LIST ALL REPORTS SPECIFICATIONS STORED IN LIBRARY
5 - CREATE; MODIFY OR DELETE A DATA DEFINITION
6 - TERMINATE YOUR SESSION

Create a report specification option # 1

The system will present the user with a series of Fill-In-The-Blank screens to capture the specifications for the report. For example, if the report requires an item computed from other items the system will present the user with the following screen:

**COMPUTE TABLE**

<table>
<thead>
<tr>
<th></th>
<th>OPER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td><strong>M</strong></td>
</tr>
</tbody>
</table>

**MESSAGES**

**DICTIONARY**

1-NAME 2-EMPLOYEE-NUM 3-SALARY
4-SALES 5-SEX 6-SALE-DATE
7-REGION 8-TAX

Example of Report Content Screen:

**REPORT CONTENT**

**DICTIONARY**

1-NAME 2-EMPLOYEE-NUM 3-SALARY
4-SALES 5-SEX 6-SALE-DATE
7-REGION 8-TAX
Run A Report

Using option 1 from the main menu you created or modified a report specification. Option 2 from the main menu will enable you to run the report you specified. As a result of selecting option 2 the system will display the following screen:

```
K-return 0-online
B-batch
enter report name->regional-sales
```

Enter "K" to return to the main menu, enter "O" if you wish to run your report immediately online. The system reads your data file and returns the report to the terminal.

You can then browse your report using *IBM/ISPF browse facility by selecting any page of your report to be displayed at your terminal. Only disk files may be run online.

Enter "B" if you wish to run your report in batch mode. Batch mode is required; if your report is accessing data files that exist on tape or are not online. Batch mode is usually more economical.

Enter the report name at the second item. This is the name you gave the report using option 1. If you leave it blank the system lists all the report names and prompts you to enter one.

*IBM/ISPF is a registered trademark of IBM Corporation.

After entering the report name and selecting the online option to run it the system will return with the following screen.

```
R-return 0-online
B-batch
enter report name->regional-sales
```

If you requested to see the program, the report program will be listed at your terminal.

The report is subsequently displayed at the terminal and can be browsed using the *IBM/ISPF Browse facility.

```
REGIONAL SALES REPORT

<table>
<thead>
<tr>
<th>REGION</th>
<th>COMMISSION</th>
<th>SALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALGARY</td>
<td>135,000</td>
<td>900,000</td>
</tr>
<tr>
<td>MONTREAL</td>
<td>337,000</td>
<td>2,250,000</td>
</tr>
<tr>
<td>OTTAWA</td>
<td>225,000</td>
<td>1,500,000</td>
</tr>
<tr>
<td>TORONTO</td>
<td>262,000</td>
<td>1,750,000</td>
</tr>
<tr>
<td>ALL</td>
<td>960,000</td>
<td>6,400,000</td>
</tr>
</tbody>
</table>

*********** BOTTOM OF DATA ***********
```

After browsing the report the system will present you with the following screen which will enable you to route the report to a printer.

```
R-return 0-online
B-batch Y-print
enter report name->regional-sales
```

If you wish to route this report to a printer enter Y above otherwise this report will be deleted.

The system has generated a computer program in order to produce your report. If you wish to browse it enter Y above and press enter key.
Benefits

- You can extract information from computer files simply by becoming familiar with a computer keyboard and the procedure to start the system. Rapport also enables you to set up an information centre for a wide audience of end users with minimum effort.
- Offers a high degree of independence from the computer language(s) currently in use thus permitting migration to new software.
- The screens and conversational prompting eliminate the need for programming statements, syntax rules, technical manuals.
- Report specifications can be easily modified.
- Total effort to specify and produce reports is substantially reduced.
- User training costs are reduced.
- Infrequent or casual users will benefit since there are no rules to remember.
- The dialogues can be offered in any language ie. French or English etc.
- Additional features can be added over and above that provided by the native language such as security or as in the *SAS example provided, Rapport uses 18 character long item names instead of the 8 characters supported by *SAS.

Installation & Hardware Requirements

Hardware
IBM 360 IBM 370 & compatible

Environment
MVS timesharing-option (SFF-MVS) with SFF version 1.0 and above and IBM OS COBOL (version 4) or any system that supports COBOL and the interactive system productivity facility dialogue management services

Installation
Information on installation procedures is contained in the Installation Guide

Acquiring The Software

This software may be acquired by sending the following information:

name ........................................
phone ........................................
title ...........................................
company .......................................
street .......................................... 
city ...........................................
province/state ................................
postal code/zip .............................
signature .....................................
date ...........................................

to: Karl McSheffrey
Information Center Software
9 Garden Place Nepean, Ont.
K2H 6M4

or call (613) 829-7351

Terms of conditions.

- The object code is available at no cost (nominal charge for copying installation tape)
- The installation tape must be returned
- The software must not be redistributed without written permission of the author
- Software and panels must not be modified without prior consent of the author
- This program is provided "as is" without warranty of any kind either expressed or implied

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