

Unlocking the SAP R/3 system using SAS/Access to SAP R/3 : a practical experience

Hans Hulpiau
SOLID PARTNERS

Overview

This paper outlines our experience in using SAS/Access to SAP/R3 in a data warehouse environment and the way to find the appropriate data and metadata.

The presentation is oriented to solution providers as well as to technical developers who are looking for experience in the domain of unlocking the SAP/R3 system for business solutions purposes.

The product we used to extract the data for the data warehouse on top of SAP R/3 is SAS/Access to SAP R/3. Our experience learnt us that this is very effective but that also a special methodology and approach is to be used to tackle with the specific requirements of the SAP R/3 system. On this approach we will focus largely in the paper.

A method of working and guidelines will be explained, since turning SAP/R3 data into business information is not only a technical challenge but even more a conceptual challenge.

Following this methodology a tool is built to answer to your business needs of getting the right information out of the SAP R/3 systems. This tool used together with the SAS/Access to SAP R/3 module offers a very powerful platform to extract the right data and metadata. Through this we can cover things as delta processing and how to refresh the data warehouse, security information and how to subset data, descriptive information and how to document data warehouse data.

First we will cover some technical items to give an overall overview of the environment. The stress will be put on the following part in which we will cover the specific approach and methodology to answer your business needs.

In all this we will concentrate on the data side of the SAP R/3 system since this operational system is the basis of our data warehouse.

Technical environment

SAP R/3 is an open environment. It is a system that contains functions, procedures, transactions, and of course data. As such it is clearly not a DBMS and it asks another approach from the technical point of view. The data that are covered in the SAP system are accessible through different ways : ODBC, SQL, ABAP/4 (programming language of the SAP R/3 system) extraction method, remote function call. The differences between these methods are to be found in the way access to the data is established.

The first two methods interact directly with the underlying DBMS. The last two methods interact with the data through the SAP R/3 system itself by using the SAP R/3 data dictionary.

Technical solution

The product we used to extract the data out of the SAP R/3 system, is SAS/Access to SAP R/3. SAS/Access to SAP R/3 uses the methods that access the data through the SAP R/3 system itself. Both methods (ABAP/4 extraction method, remote function call) are possible.

Opting for one or the other method depends on the table to extract. As such, SAS/Access to SAP R/3 is very powerful and offers a lot of possibilities.

The main issue is that SAS/Access to SAP R/3 gives access to whatever SAP-table and variables. It creates a data step to extract the data. This data step can be used in online processing as well as in batch. Also conditioning is possible through the building of a where-clause. A GUI interface offers an intuitive access to the selection possibilities.

Architectural set-ups are numerous :

while the SAP system runs on one machine, the result can be extracted directly to another machine. All this can be managed from the GUI of SAS/Access to SAP R/3 offered on for instance a windows PC.

To extract data no knowledge is needed of ABAP/4. It is complete hardware independent and SAS/Access to SAP R/3 is also independent of the underlying DBMS used.

For more in depth information about the technical solution and the business profit of using SAS/Access to SAP R/3 we refer to the paper given by P. Xhonneux of SAS Institute on SAS/Access to SAP R/3.

Conceptual overview

The SAP R/3 system is the foundation of the data warehouse. It contains the data that are to be transformed into information we need two major elements :

- a technical solution
- a methodology

The technical solution is provided by SAS/Access to SAP R/3.

The way to answer to your business needs and to get the answer by extracting the corresponding data, must be treated by the methodology.

We will focus further on in this paper in the approach and methodology.

The methodology

Particularities of the SAP R/3 system :

To make it clear why a special approach is to be taken into consideration some of the particularities of the SAP system are to be explained.

The SAP R/3 system is not just a DBMS. It is a system that is built on very different and elaborate modules that can cover a company's complete organisation going from material management to human resources through financial management. All these modules interfere with each other. This is of course as a result of this, also the case for the underlying data. The SAP R/3 system contains functions, procedures, transaction,...

We focus on the first part of building the data warehouse on top of the SAP R/3 system : extraction of the operational data. A very important element here is of course the structure of the data and the metadata. We will cover both aspects :

- the data side

- the metadata side

The SAP R/3 data :

When focused on this the following appears :
the SAP R/3 system contains a lot of tables (15000) and a lot of variables (500000). This is explained by the fact that the underlying tables cover the whole SAP system even if only some specific modules are implemented at the clients site. It is the challenge to find the appropriate data in this enormous amount of data.

The SAP R/3 metadata :

When focused on the metadata part the following appears :
the SAP R/3 system is a very well documented system.

The business logic of the SAP R/3 system is documented in the system itself. This covers datamodels, entities,...

For each available data element in the SAP R/3 system a special structure of documenting is applied. Detailed metadata on each element is available.

The availability of detailed metadata is vital for the data warehouse. This information stored in the SAP R/3 system needs to be available in the data warehouse.

TOP-DOWN approach :

The SAP R/3 system gives us three basic elements to work with :

- an enormous amount of data
- documentation of the business logic
- very well documented data and metadata

It is clear that a specific approach and methodology is needed to integrate the above elements.

The approach we present is a TOP-DOWN approach.

As said earlier the SAP R/3 system contains a very well documented data dictionary. In this dictionary not only the physical layer (tables, variables, relations,...) is documented as in a traditional DBMS, but also the logical layer is documented. It means that the business logic is available in the SAP R/3 system. When in a traditional DBMS the logical design is done through another (CASE) tool and afterwards transferred to the physical design; in the SAP R/3 system this logical design as well as its documentation is done in the SAP system itself (SERM method).

These two design parts are well documented and even more they are related to each other in the SAP system itself. The link between data models, entities, tables and variables is available. This offers a very particular opportunity :
it is possible to access the physical data through the logical business model. The approach is an approach where data (the physical layer) is reached through the business logic.

By an extensive use of the data dictionary it is also possible to easily extract the necessary descriptive information for all building elements from data model to variable. The latter means that the documentation part (metadata) which is very important in data warehousing can be taken from the operational environment. These metadata are as said very well documented and because of this very useful for data warehousing purposes.

As described earlier, two major elements need to be taken into account in order to disclose the wealth of data and derived information in your SAP R/3 system.

On one side, a technical solution is needed to be able to access the data. This is done through the SAS/Access to SAP R/3 system. This product is available in production and offers a more than satisfactory solution to the technical accessibility.

On the other side, a methodology to access the right data is clearly mandatory. This area is one of the important issues that SOLID Partners is dealing with and that results in the design and implementation of an effective tool.

Conclusion

The method explained uses the data dictionary information that is available in the SAP R/3 system in a very efficient way.

As the data dictionary covers the whole SAP R/3 system and all its modules are documented in the same way, the approach proposed is module independent. It can as well be used for the financial module as the human resource module etc.

Customisation done at the clients site, which is very common in the SAP R/3 environment causes no problem for this approach. This customisation is also to be documented in the SAP R/3 data dictionary.

The approach offers the possibility to extract data restricted to a business area. Instead of accessing an individual table, extraction is done through the logic. This offers the possibility to extract different tables, different physical elements, corresponding to your business entities, at a time. Even more the knowledge of physical table names and physical variable names is not needed as business terminology is available.

The combination of SAS/Access to SAP R/3 and the methodology proposed offers a very powerful way to extract business information out of the SAP R/3 system.

Hans Hulpiau

SOLID Partners
Drie Eikenstraat 661
2650 Edegem
Belgium

Tel. +32 3 828 93 73 Fax. +32 3 828 99 23
+32 95 52 36 31
E-mail hans.hulpiau@solidpartners.be

SAS software, the SAS System, SAS/Access to SAP R/3 are registered trademarks of SAS Institute Inc.
SAP R/3 is registered trademark of SAP AG.