Brief Guideline

Preparation and Extraction of SAP ERP Data

Roger Odenthal

Roger Odenthal & Partner , Wiener Platz 2, 51065 Köln, Telefon 0221-4921403, Telefax 0221-4921404, E-Mail: info@roger-odenthal.de, Home: www.roger-odenthal.de

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1 Introduction

The evaluation of SAP ERP data is interesting for a large number of auditing areas. Internal audit, financial audit, and external audit are all interested in company data, as are bankruptcy trustees and the criminal investigation departments of the police in case of suspected embezzlement. This raises the question of how data can be extracted from a data processing environment in as uncomplicated a manner as possible and evaluated using spreadsheet software, databases or audit programs. SAP makes various ways available.

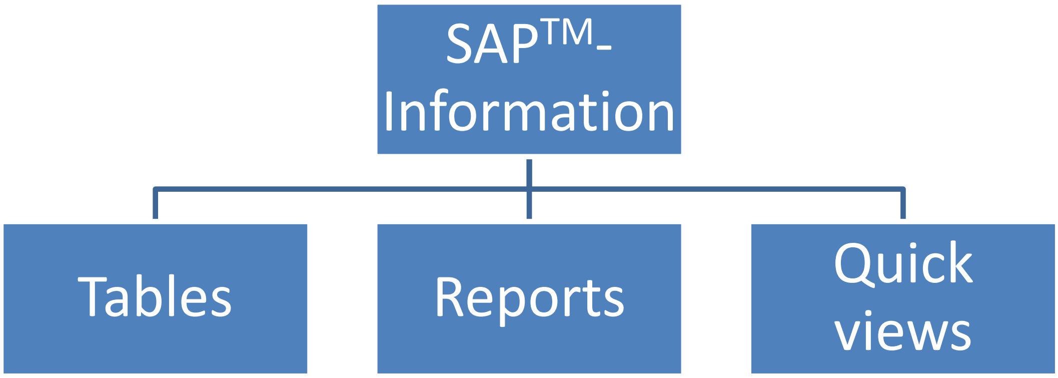


Figure 1: Alternatives for information preparation in an SAP™ system

A comprehensive illustration of the ways to prepare SAP ERP data, each with related specific advantages and disadvantages, can be found in the guideline by the authors on SAP ERP basic auditing, which can be ordered on CD-ROM, or downloaded from the internet at:

www.roger-odenthal.de

The remarks below contain a *brief summary* of the alternatives outlined there.

2 Fine-tuning the data selection for tables and reports

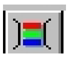
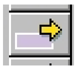
Regardless of whether an SAP ERP system obtains information using tables, reports, or quick views, the selection screens that are available generally do not meet the requirements of an audit.

Special questions, such as:

- Which administrator input credits for the customer Meier in an amount of more than EUR 10,000.00 on December 25?
- In a random sample of individual documents on payment transactions, only credits, payments in intervals of EUR 10,000.—through EUR 20,000.—and all items above EUR 100,000.—should be included.

cannot be answered at first glance.

Every selection screen in this has additional control options:

- Dynamic selections		(only for reports and quick views)
- Multiple selections		for every selection field
- Selection options		for every selection field

Dynamic selections permit the inclusion of all interesting data fields from the area of master and transactional data, which affect the subject of the report, on the selection screen for reports and quick views.

The *multiple selection* enables different individual values or value intervals to be used for each selection field.

Selection options also allow the user to determine the criteria “equal, greater, less” and any combination of those for each selection field.

All tools together enable fine-tuning the selection process and contribute toward satisfying the particular information needs of the auditors.

3 The preparation and transfer of tabular data

3.1 Notes on tabular data

Data storage in the SAP ERP system is done in relational database systems. Data is stored there in tables. In this, *technical considerations* (avoiding data redundancies) determine the *distribution of information into individual tables* as well as their communication using key relations.

The direct access to SAP tables is therefore only suitable to a limited degree for satisfying the information wishes of the user. The following advantages and disadvantages must be taken into account.

Advantages:

- Flat data structure

  Tables have a “flat” structure. Information that belongs together can be found in the fields of a single row of data.

- Fixed field and record lengths

  Depending on the method of transfer, the data items in the tables have uniform field and record lengths or are equipped with field delimiters. This simplifies transfer into other programs (such as audit software).

- Integrated evaluation functionality

  Tabular data can be accessed with graphic reporting tools in the SAP ERP system, which enable *sorting, filtering, grouping and totaling* these data within SAP ERP.

- Direct connection to calculation software

  For tabular data there is an interface which for a manageable volume of data enables this to be directly saved on a personal computer in spreadsheet formats (such as Excel).

Disadvantages:

- Distribution of data

  In order to avoid data redundancies, data needed for a uniform test field are frequently saved in *different tables*. This means that for one audit, data from several tables will be needed, and that after its separate extraction from the SAP ERP system it will have to be rejoined on the personal computer.

- Concentration on “net data”

  Tables only contain “naked” data. Compiling it into logical information relationships, which accompanies its condensation by calculation processes as well as merging information from different tables, is not done.

Considering the advantages and disadvantages presented, one must carefully consider whether the necessary information for the audit can be determined from tables. As a rule of thumb, *master data* is *easy* to access and evaluate, while complex questions using transactional data are very seldom answered satisfactorily using tabular data.

There are various transactions available for visualizing tabular data within an SAP ERP system:

- SE16 / SE17 Data browser
- SM30 / SM31 Table maintenance

Of these, the auditor should use *Transaction SE16* to access tabular data. This includes *all tables*. Transactions SM30/SM31, on the other hand, limit the access options to certain tables.

In selecting information from tables, the structure of the data storage within an SAP ERP system must be taken into consideration. Without going into their complexities, be aware that the following hierarchical ranking of the data structures in tables must be taken into account for master files:

- A tables (Client level, such as LFA1 general vendor master data)

  General cross-company-code information such as supplier names, city, postal code, telephone number, etc.,

- B tables (Company code level, such as LFB1 company-specific vendor master data)

  Company-specific information such as bank information, assigned G/L accounts, payment history, reminder dates, conditions etc.,

- C tables (Transaction figure level, such as LFC1 vendor booking volumes per business period)

  Information on sales in the individual posting periods.

The structure for *Document data* is two-part, with a document head and document segment.

3.2 Information from tables using a generic search

Tables are saved with *meaningful names*. These can be searched. After inputting Transaction SE16, one can add part of the table name followed by "*" and expand the input field with the downward-pointing arrow.

Below are a few examples for table names:

LF*	Vendor-creditor data
KN*	Customer/debtor data
SK*	G/L data
AN*	Asset data
US*	User and authorization data
T0*	Control data for financial accounting
PA*	Personnel data

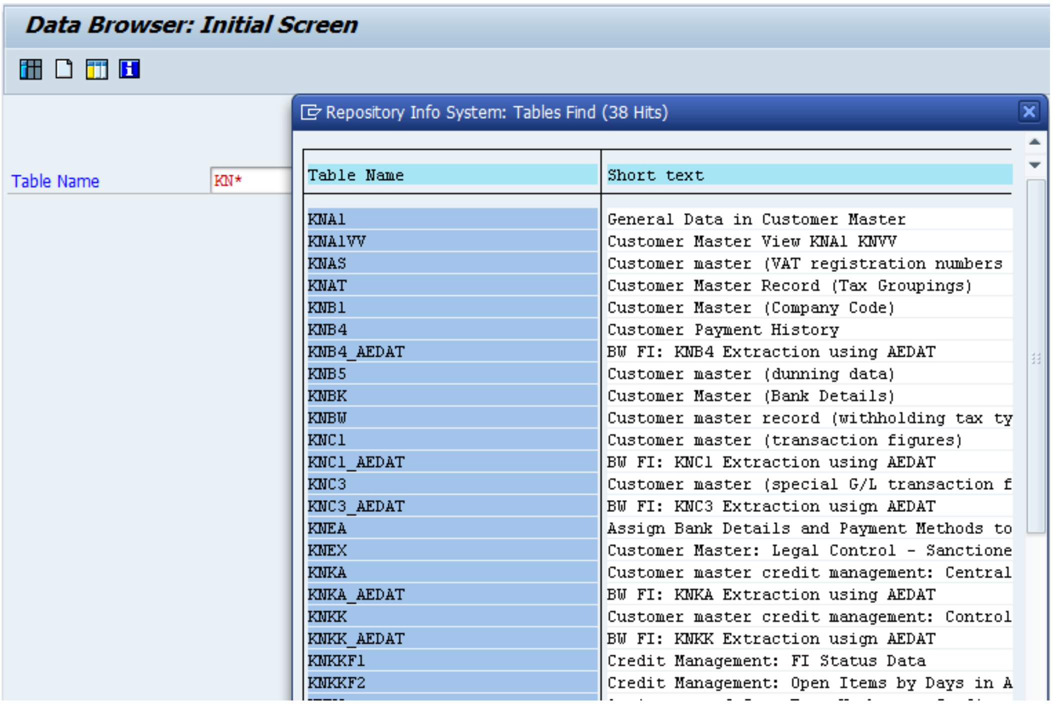


Figure 2: Searching tables by table names

As soon as a table has been found, the desired data can be selected using the appropriate selection screen. Using the command sequence

Settings

User-specific settings

ALV-Grid display

a graphic display of the table data can be obtained. *Filtering, sorting and grouping the data* is also possible here, as is download in an Excel format.

3.3 Information from tables using logical databases

Thematically related tables are linked by SAP™ within logical databases. By analyzing logical databases, suitable tables for audit-relevant questions can be determined.

Tools →

ABAP Workbench →

Development →

Programming environment (SE36)

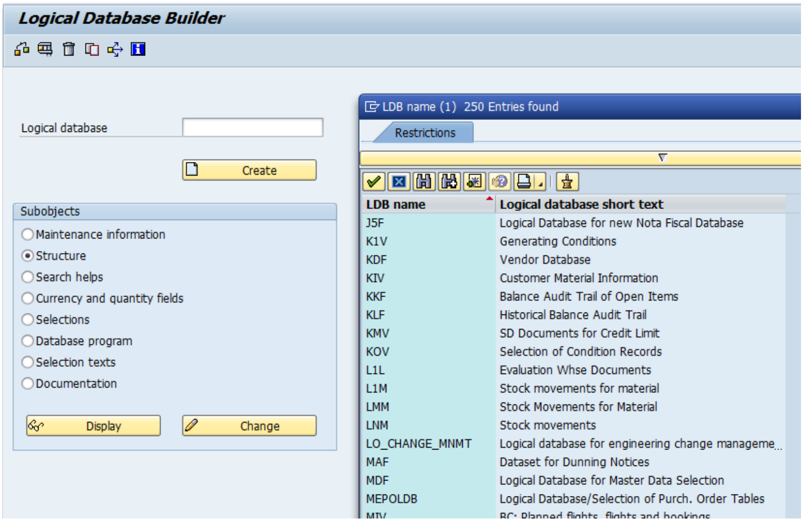


Figure 3: Selecting logical databases

Below are a few important databases with their names and abbreviations:

Database name	**Description**
ADA	Asset database
BRF	Document database
BRM	Accounting documents
CKM	Materials master
KDF	Database vendor
LNM	Warehouse movements
DDF	Customer database
PNP	Personnel master data
SKF	G/L database

After selecting a table, the following image is received:

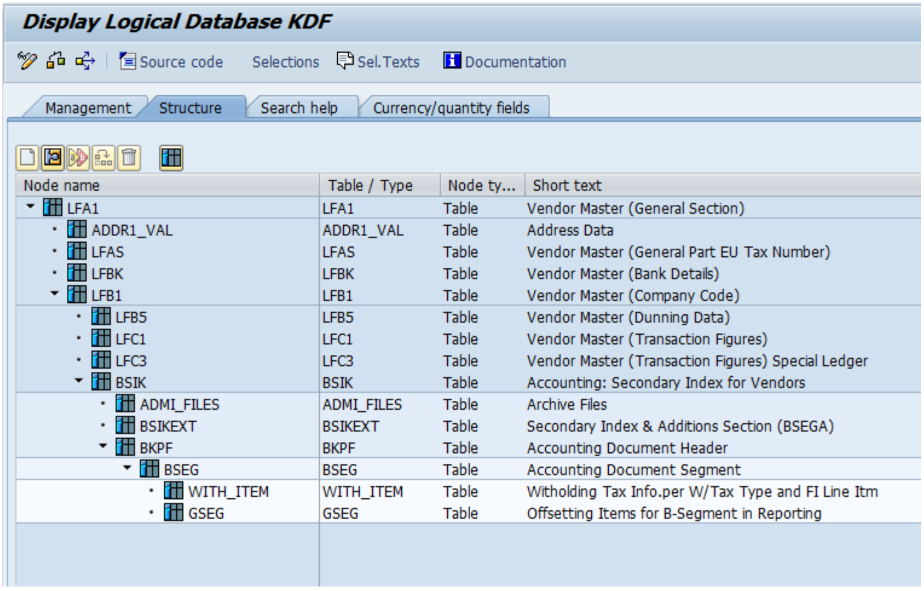


Figure 4: Structure of the logical database "Vendor data"

The structure for document data is two-part, with a document head and document segment.

After marking a suitable table, the associated *fields and field descriptions* can be displayed by right-clicking. Furthermore, the report **"RDD00DOC"** provides a detailed documentation, including description of the contents, of the individual data fields in a table.

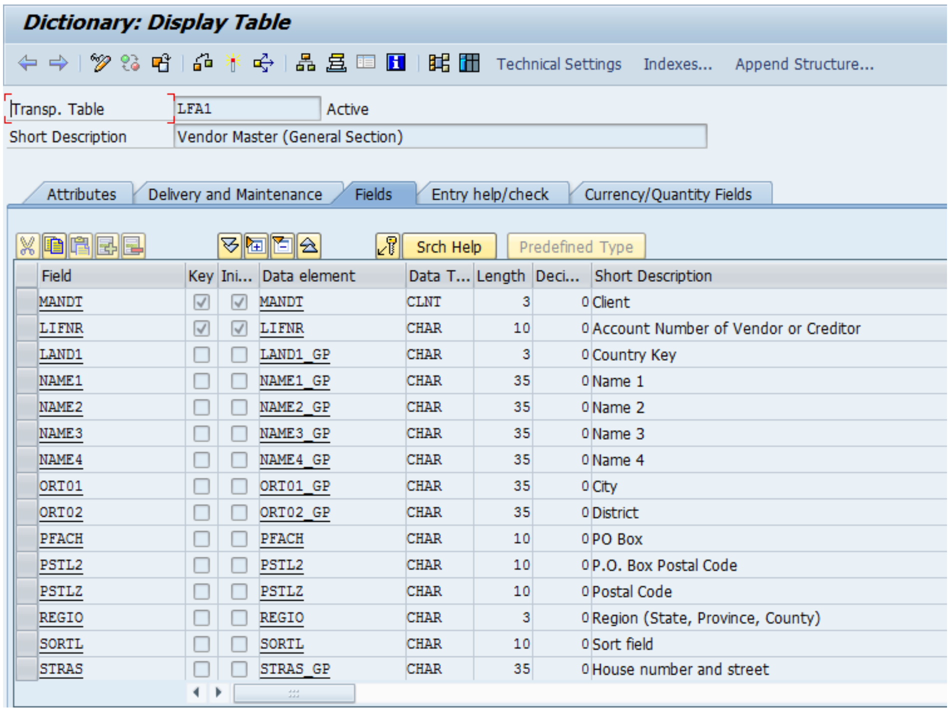


Figure 5: Fields from the customer database "LFA1"

3.4 Information from tables using the Repository Information System

The Repository Information System is called up with transaction **SE84**. The menu is then opened with

ABAP-Dictionary →

Database tables

The outline of the field "Application components" (in the right window) displays the available application components, which can be selected to limit the appropriate tables:

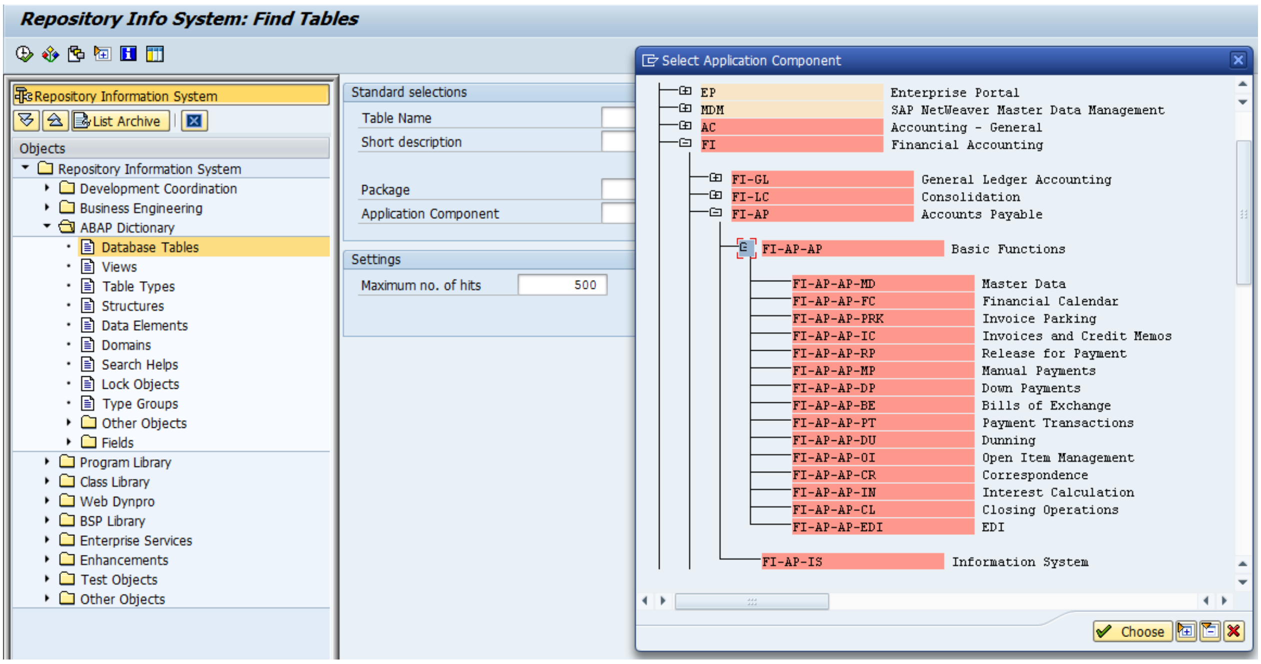


Figure 6: Repository Information System

When a component is selected, all the tables selected to that component are then displayed.

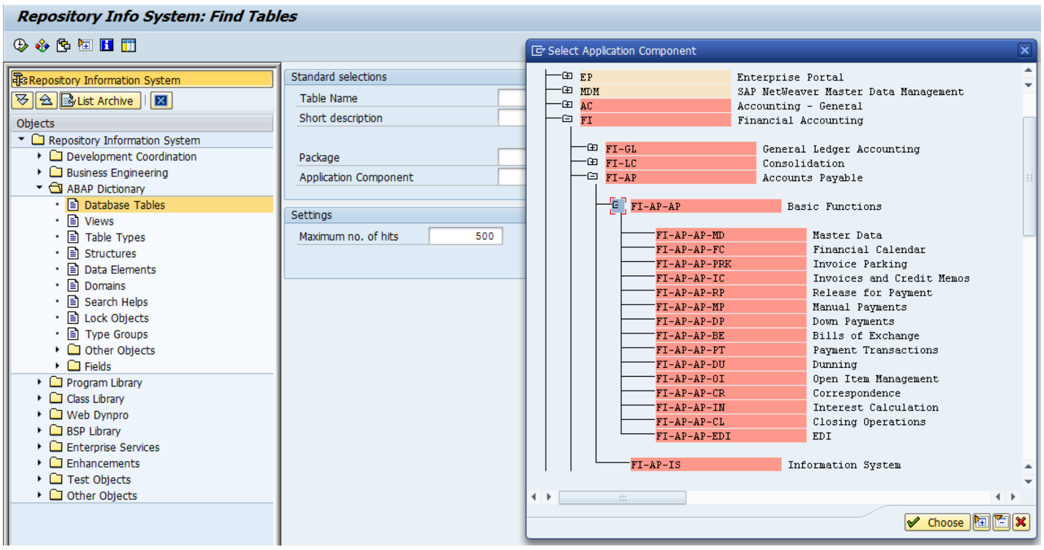


Figure 7: Repository Information System

By double-clicking on the table names one obtains an overview of all fields in the table.

3.5 Information from tables using the SAP table handbook

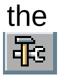
If the name of a table is already known and one would like to know which tables is has additional relationships with, the SAP table handbook should be used. It is called up with transaction SA38 and report name **RSSDOCTB**.

At the end of the list (disregarding the information on the structure of the table) there is an overview of the relationships for the table. From this it can be determined, for example, in which table the posting keys are saved.

```
Table Manual ABAP/4 Dictionary Rel. 700                            LFA1
________________________________________________________________________

LFA1                Vendor Master (General Section)
Table class           TRANSP      Delivery class:A
Last change by        SAP         Last change on01.06.2013
________________________________________________________________________
Technical settings
Data class:           APPL0       Size category:3
Buffering type:
________________________________________________________________________

Table structure

Field name K Type Length Data el.  Domain     Text
________________________________________________________________________

MANDT      X CLNT 3      MANDT     MANDT      Client
LIFNR      X CHAR 10     LIFNR     LIFNR      Account Number of Vendor
                                              or Creditor
LAND1        CHAR 3      LAND1_GP  LAND1      Country Key
NAME1        CHAR 35     NAME1_GP  NAME       Name 1
NAME2        CHAR 35     NAME2_GP  NAME       Name 2
NAME3        CHAR 35     NAME3_GP  NAME       Name 3
NAME4        CHAR 35     NAME4_GP  NAME       Name 4
ORT01        CHAR 35     ORT01_GP  TEXT35     City
ORT02        CHAR 35     ORT02_GP  TEXT35     District
PFACH        CHAR 10     PFACH     PFACH      PO Box
```

Figure 8: Table handbook

3.6 Information from tables using the help text in a transaction

If one would like to know which table is called up in a transaction, one can call up the transaction and go into one of the fields to be managed. By right-clicking in the field and selecting “Help,” the documentation for the field is displayed. Using the button  one can see what table is involved. However, frequently only the structure names are given here; these cannot be called up with SE16, since the data are only loaded into the tables when they are run.

3.7 Calling up data from the tables

Once a table has been identified for export, it is called up (assuming the proper authorizations are in place) using transactions SM30, SM31 or SE16. The following notes are to be taken into account here:

- Be aware of the maximum number of hits; determine the number of data sets in advance.
- Note that the width is set to 1,023. If there are many more fields, they will not be displayed.
- The required fields can be searched using the field selection function (Settings → List preparation → Field selection)
- Selection criteria for the selection can be expanded using Settings→ Fields.

- The displayed data can be sorted by different fields. To do this, mark the appropriate column and then select the symbol .
  Using the command sequence Settings → List preparation → Sorting, multiple sorting criteria can be specified.

Once one has obtained the selected data, it can be transferred to the PC. This is done using the command sequence Edit → Download.

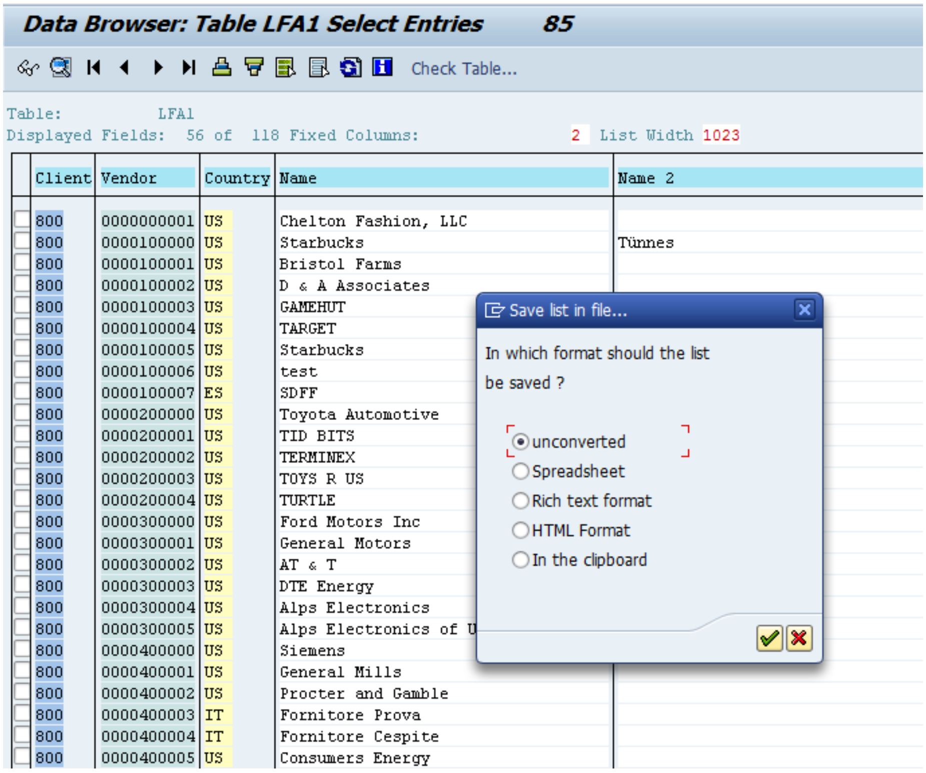


Figure 9: Data download

4 Evaluating and preparing information using reports

4.1 Notes on reports

There are standard lists (reports) available within SAP ERP systems for every information area. In contrast to generating information from tabular data, pre-structured *reports* have *the advantage* that all necessary information is integrated into the list called up, and the user does not need to concern himself with the technical details of the data structure or with linking data.

Lists are especially well suited for gathering information in complex audit areas, as well as for transaction data, account statements or balances. One *disadvantage of list data* is that it is only suitable to a limited extent for further processing using special analytical software on the auditor’s own computer. Irregular structures, a hierarchical setup (e.g. account number followed by different postings) as well as formatted characteristics such as cover sheets or page breaks are all issues in this regard.

If lists are correctly structured, they can be transferred to the personal computer in file form and then changed back into database format using special programs such as Monarch.

4.2 Selection and preparation of list data

SAP ERP lists have "meaningful names," which can be searched. The menu sequence to do this begins with the "System" command located in the upper screen bar and is as follows:

System →

Services →

Reporting

Transaction (SA38).

The user is requested to add a report name. The auditor should then insert a search screen with the commands

Tools →

Search program.

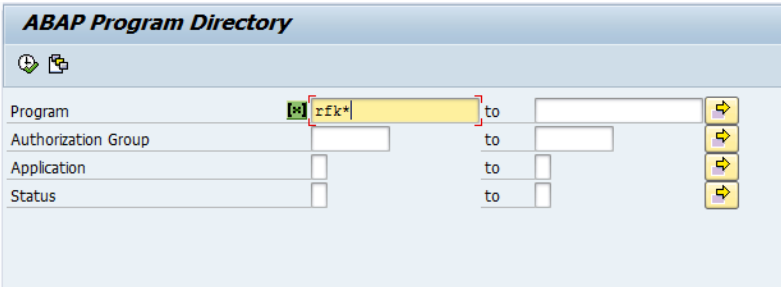


Figure 10: Searching programs using program names

The reports can then be reserved under the following program names, etc. although this system is not always followed:

- First letter

  If it is an SAP ERP standard report, it begins with an "R." Company lists begin with the letters "Y" and "Z."

- Second letter

  For standard reports, the second letter in the report name is the application:

F	Financial accounting
P	Personnel
M	Material
V	Sales
A	Asset evaluations
S	Basic system applications

  For reports developed in-house, one should check whether these also follow a system. Otherwise, the search must be limited to the initial letter (Y/Z).

- Third letter

  Using the third letter of the report name generally allows a closer *identification of the information area*. Here are a few examples:

RF*B*	Document evaluations
RF*K*	Creditor evaluations
RF*D*	Debitor evaluations
RF*S*	G/L evaluations

The generic search function is fairly reliable up to the second or third letter. The remaining part of a list name must then be replaced with the "*" as a wildcard symbol.

After inputting the letter combination and the wildcard symbol, click the *"Execute" button*. The user receives an overview of all reports that follow this naming convention. An appropriate evaluation must be selected using the report descriptions. When this is marked, then the *"Documentation" button* provides more extensive explanations of the indicated program.[1]

4.3 Interactive lists

When selecting the reports, one can frequently select between the reports in the old format and the reports as **interactive lists**.

For example, the customer line item list (**RFDEPL00)** is offered in two variations: **RFDEPL00** and **RFDEPL00_NACC**. Of these,

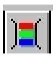
- RFDEPL00 is the new interactive list, while
- RFDEPL00_NACC is the old, non-interactive list.

This standard has not yet been implemented for all reports, but has already been used in a number of reports.

Data from the interactive lists can be transferred directly into Excel . To do this, the layout may have to be changed after preparing the report. .

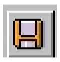
4.4 Dynamic selections expand the selection opportunities

The selection screen generally does not meet the special requirements for internal and external auditing using special queries (e.g. all documents over 1000 Euro). Such additional queries can be handled using **dynamic selections**.

By clicking the  symbol or using the command sequence **Edit → Dynamic selections,** all interesting data fields from the subject of the report can be included in the selection.

4.5 Other techniques

Fine-tuning reports with regard to the special evaluation requirements of an audit is sometimes time-consuming and associated with the wish to save the results on a long-term basis within the SAP™ system. This is especially sensible if control awareness is developed by the technical departments due to an ongoing disclosure of noticeable facts. The R/3™ system offers interesting options for this, which will be explained below.

After completion of all selection criteria within the selection screen, the results can be saved using the diskette symbol  or the menu sequence

Branch →

Variants →

Save as variant.

[1] More detailed explanations on a number of SAP standard lists that are interesting for auditing can be found in another guideline by the author, "SAP reports for audits," available separately.

Next, the user-specific variant name and an explanation of the purpose and content of the variant should be added in the field “Significance.” After this, the auditor has a number of options available which affect calling the variant.

- General protection “Protect variant”

  If a *continuous equal result based on the preset values* within the variants is desired, then the auditor should check this field. In this way, he/she is the only one who can change the variant, and the input fields on the selection screen are *no longer overwritable at the start of the variant*.

- Field-related settings

  Beyond the general protection of a variant, the user has configuration options for every input field on the selection screen, as well as dynamic selections.

  - *Protect a field*

    If a selection field is protected, the *value set* by the auditor when setting up the variant remains *visible*, but it can *no longer be overwritten* when the variant starts.

  - *Hide a field*

    Selection fields for which there should never be an entry made when starting a variant can be completely hidden on the selection screen. This is sensible for audit purposes if the selection criteria is not intended to be seen by other parties or if it is completely insignificant for the evaluation.

Example of use:

If documents for a predetermined amount are to be consecutively issued for a certain company code, it is advisable to enter the corresponding values in the selection screen, generally protect the variant, hide the unnecessary fields and also protect the fields for which inputs are to be made from unintentional entries.

The **advantage** of static variants is that the corresponding evaluation is “wired” in the system, available for continuous applications.

On the other hand, there is the **disadvantage** that several variants must be set up for comparable evaluations which, for example, affect different company codes and – if values that change over time (business year) are included in the variants – each individual one may have to be changed.

Calling up self-produced variants is done using the commands

Jump →

Variants →

Get

4.6 Download report data

All evaluations that appear on the SAP ERP screen can be transferred to a personal computer using the command sequence

System →

List →

Secure →

Local file.

The result is a print-ready file with all elements of a list such as headers, page breaks, subtotals and grand totals.

5 The SAP ERP "Quick View" list generator

5.1 Notes of using Quick View

SAP makes a "list generator" available to the users, which makes it possible to create evaluations without a detailed knowledge of the internal SAP programming language (ABAP/4). As a rule, the corresponding data are taken from tables, so that the necessary individual tables and their structure und must be known (see chapter 2.2).

The creation of quick views has the advantage that a link can be made between different tables within the SAP system. Furthermore, the lists created have a high degree of interactivity. It is therefore possible, just as in tables, to sort, to filter, to change fields and to make groupings with subtotals. Quick view data has a flat structure and can be transferred like that from the SAP ERP system, so that it can be loaded into any PC software with no problems.

Despite all the advantages shown, it should be noted that complex evaluations, such as the inclusion of calculation procedures, cannot be done using the list generator.

5.2 Creating Quick views

Calling up the list generator is done using the menu sequence

System →

Services →

Quick viewer

Creating the list is done in *two steps*. First, a *data source,* in the form of a table, an interface of several tables, or a logical database, is selected. The fields necessary for creating the lists are selected from these, supported by a menu.

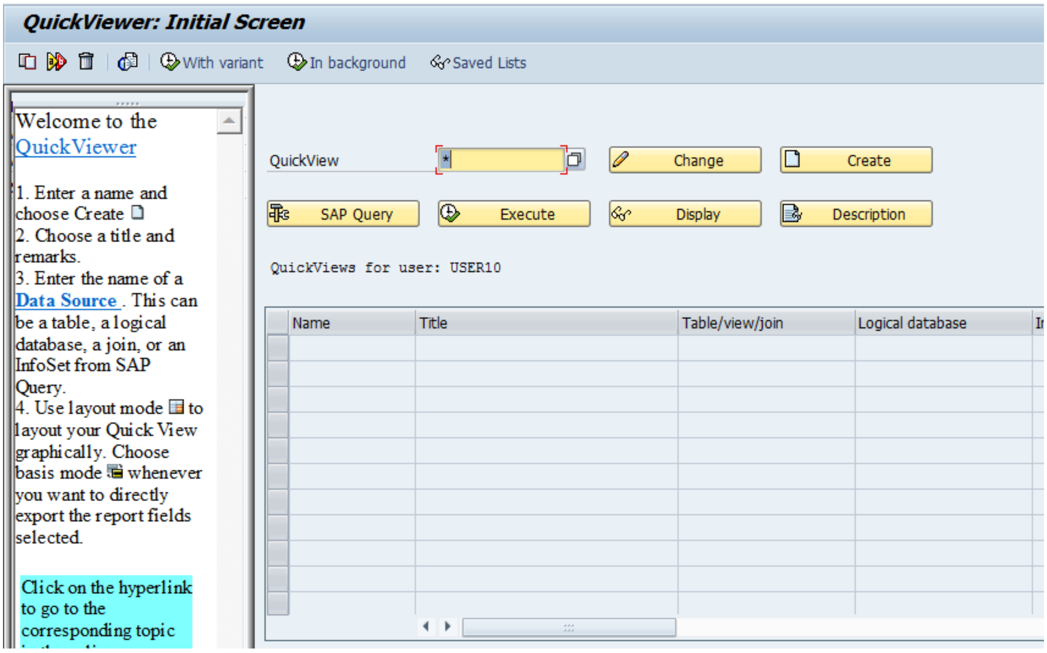
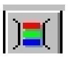
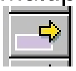


Figure 11: Setting up evaluations with quick view

Formatting the list with a cover sheet, a header, sorting sequences and similar characteristics is done in a second step. The list can then be called up.

Menu navigation for the end user within the quick view is uncomplicated and is oriented toward setting up evaluations in relevant PC programs such as Access or Excel.

6 Overview of evaluation tools

Purpose	Transaction	Remarks
Selection control		
Insert additional selection fields in the selection screen	Edit / Dynamic selections 	Only for reports and quick views
Select different individual values and value intervals	Multiple selections 	For every selection field
Determine different selection criteria “equal, smaller, larger”	Edit / Selection options 	For every selection field
Tables		
Calling up tables	SE16 / SE17	
Search for tables using table names	Input parts of the table name into the input field followed by “*” and expand field	A-tables (Client level) B-tables (Company code level) C-tables (Transaction figure level) Naming conventions: LF* Vendor data KN* Customer data KS* G/L data AN* Asset data US* User and authorization data T0* Control data for financial accounting PA* Personnel data
Data transfer to a personal computer	- Edit / Download - System / List / Secure - Excel symbol (ALV grid)	ASC II – Delimited ASC II – Delimited Limited data volume
Change the table view	Settings / User-specific - SE16 Standard list - ALV grid	- for large data volumes - interactive lists
Reports		

Purpose	Transaction	Remarks
Calling up reports	Information system or SE38	General reporting
Search for reports using report names	- Selection screen with tools / search program - Input part of the report name followed by a "*" and command "execute"	- R* = standard report - Y/Z* = internal company reports - RF* = financial accounting - RFK* = creditor data etc.
Data transfer to personal computer	System / List Assure / Local file	File ready to print Preparation with Monarch DataImport or ACL
Quick view		
Call up your own quick views	System / Services / Reporting or SA38 Tools / Search program	Quick view's usually begin with the designation "Aq*"
Data transfer to personal computer	- Excel symbol - File storage	- for smaller files - ASCII delimited format