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Migrating Your SAP Data





Bonn • Boston

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This chapter introduces you to the basic concepts that you need to understand during any data migration, regardless of which technique you select. It also describes the major process steps involved in data migration from a technical perspective.

3 Technical Basics for Migrating Data to SAP ERP

3.1 Basic Terminology

The following terms will appear throughout this book:

Data migration, migration

The term *data migration* refers to the transfer of business data (master and transaction data) from any application system to an SAP ERP system. The term *migration* is used as a synonym. Please note that this term is also used in other contexts, such as migrating from one technical platform to another; however, this is not the intended meaning here.

Data migration is sometimes also referred to as data transfer.

Legacy system

The application system that contains the data to be transferred before the migration is referred to as the *legacy system* (or source system).

Legacy data

The data that is to be migrated from a legacy system to the SAP ERP system is referred to as *legacy data* (or *source data*).

▶ Data object, business data object, business object

A data migration is usually based on data objects. A *data object* is a business data unit such as a customer master, material master, an FI document, and so on. Such objects are sometimes called *business data objects* or simply *business objects*.

Data migration object, object

When data objects are mentioned in the context of data migration, the terms *data migration object* or simply *object* refer to a data object that has additional attributes that are relevant for the data migration, for example, the structure of the data object in the legacy system and the SAP ERP system, along with the mapping that connects the two structures.

▶ File, text file, table-like file, sequential file

All of the data migration techniques described in this book assume that the legacy data is available in one or more files. These files are usually *text files*, that is, files that are divided into several lines. The structure of these lines is differentiated as follows: If all the lines in a file have the same structure, that file is called a *table-like file*. In this case, the sequence of the lines in the file is usually not important for data migration. If all the lines in the file don't have the same structure (header and item records, for example), the file is called a *sequential file* (see Section 7.2.9).

Frontend, SAP Application Server

In the SAP ERP system, files can be saved in one of two places: either on a *frontend*, that is, the end user's workstation, or on an *SAP Application Server*, the computer that runs the application logic of the SAP ERP system (or a storage medium accessible to the SAP Application Server).

3.2 The Data Migration Process from a Technical Perspective

Regardless of which migration procedure you select, every data migration project involves certain basic technical steps. The following five steps are characteristic of almost every data migration procedure.

3.2.1 Exporting the Data

First, the data you want to transfer to the SAP ERP system (i.e., the legacy data) has to be exported from the legacy system. This step is also referred to as *extracting* or *unloading* the legacy data.

The data migration procedures introduced in this book don't provide any support for exporting the legacy data from legacy systems. You will need to determine whether your legacy system offers functions for this purpose. If not, you will need to write suitable programs for data extraction in the legacy system.

In the process of exporting data, you must define how you want to store the legacy data. In particular, you must decide whether you want to group all the legacy data together in one file or divide it into several smaller files. You'll also need to define whether you want to write the legacy data to table-like files or to sequential files.

3.2.2 Reading the Data

Technically speaking, the legacy data exported from a legacy system can be saved in different files (see Section 7.2.9). It may therefore make sense to transform the data to a technically standardized format initially. However, most of the data migration procedures don't support this option. Instead, it is assumed that the legacy data will be provided in a predefined format.

Of all the data migration procedures introduced in this book, only the *Legacy System Migration Workbench* (LSM Workbench) offers this option. In this case, the files, which can exist in different formats, are merged into a single sequential file. For more information, see Section 7.2.9.

3.2.3 Converting the Data

Application systems can model business data in many ways. You cannot assume that the data you export from a legacy system can be easily imported into an SAP ERP system without additional processing. Consequently, you usually have to convert the exported data to the appropriate format.

Note

The term *convert* is used synonymously with *transform*. The terms *data conversion* and *data transformation* are also used in this context, as well as *mapping*, *field mapping*, and *transformation*.

Data extraction is the responsibility of the legacy system

Transforming the data to a technically standardized format

Converting the legacy data to SAP format The data conversion can be as complex as is necessary. The effort required depends on how different the source and target formats are from one another. In order to make the work less cumbersome, however, you can define typical conversion tasks that must be performed repeatedly.

- Value conversion
 Value conversion involves translating a known set of possible field values to a different set of values. This can apply to the country codes, for example, if the legacy data stores this information in a one-place field ("D" for Germany, "U" for the U.S., "I" for Italy, etc.), while the SAP ERP system uses ISO codes that can be up to three places long ("DE" for Germany, "USA" for the U.S., "IT" for Italy, etc.). In this case, the following conversion must be defined:
 - ▶ $D \rightarrow DE$
 - ► $U \rightarrow US$
 - $\blacktriangleright \ I \to IT$
 - And so on

This process is also referred to as translation.

- Converting field attributes
 The conversion of field attributes involves changing the representation of certain field contents. Let's assume, for example, that your legacy system saves date values in the format DDMMYY (such as 311295), while the SAP ERP system expects these values in the format YYYYMMDD (such as 19951231). You must convert these values accordingly. You can do so with custom programming, or by using a tool that supports such standard cases at the touch of a button.
- You may also need to define default values for certain field values. You should always keep the following fact in mind: The data objects in the SAP ERP system are usually quite extensive. In most cases, your legacy system will contain only a fraction of the fields that are available in the SAP ERP system for a given data object. Frequently, you'll encounter situations in which the SAP ERP system expects a value for a field, but your legacy system doesn't have an equivalent for that field; for example, the company code used in the SAP ERP system is a variable that is unknown in many legacy systems.

There are two basic ways of dealing with such situations:

- ▶ If the desired value can be derived from other available data, then you can fall back on a simple conversion of values (translation).
- ▶ If the desired value is always constant (or at least for long periods), you can set it to a constant. The technique of using fixed values, which provides a greater degree of flexibility than working with constants, is introduced in Chapter 7, together with the LSM Workbench (see Section 7.2.8).
- ► In some cases, you must not only convert field contents and field attributes on the way from the legacy system to the SAP ERP system, but also change the overall structure of the data object.

Converting structures

For example, let's assume that a legacy system can save a maximum of three contact persons for a customer. Let's also assume that these (maximum) three contact persons are saved in the header record of the customer master record. You can define any number of contact persons in the SAP ERP system. A separate table record is created for each contact person. Therefore, in this case, you must convert the structure as shown in Figure 3.1.



Figure 3.1 Converting Structures – Example

3.2.4 Importing the Data

All the previous steps serve to successively convert the legacy data into a format that the SAP ERP system can process. The next logical step is to transfer this converted legacy data to the database of the SAP ERP system. In addition to *importing data*, the term *loading data* is also used, as well as *uploading to SAP ERP*. There are generally two options for importing data:

Direct writing to the database If you fully understand how the structure of database tables works in the SAP ERP system, you can use an ABAP program to write the legacy data directly to the database tables, at least theoretically. When it comes to throughput — the number of data records processed in any given time unit — this method is unbeatable. However, we don't recommend using this procedure because of the incalculable risk involved, namely, if this technique is used, that the database of the SAP ERP system could be filled with data that is inconsistent according to the rules of the SAP application. Consequently, you might not be able to process it further, or even display it, in the SAP ERP system.

Using standard All the procedures introduced here employ a different method. They are based exclusively on the interfaces provided in the SAP ERP system. In the following sections, these interfaces are called *standard ERP interfaces*. The standard ERP interfaces used in this book are outlined below.

Batch input

Batch input refers to both a standard ERP interface and a procedure for data migration. This mature, proven technology "feeds" dialog transactions with the provided data (usually in the background). This ensures that all input checks are run, ensuring that all data imported with batch input is correct and consistent in the SAP ERP system. Of course, this certainty has its price: The data checks reduce throughput.

Direct input

Because throughput from batch input is not always sufficient, direct input programs have been written for some data objects. In a sense, direct input involves the controlled, direct writing to the database of the SAP ERP system.

► BAPI

Business Application Programming Interfaces (BAPIs) were originally developed to open the SAP ERP system for external access. Data objects usually have read and write BAPIs. The latter can also be used to transfer data to the database of the SAP ERP system during a data migration.

► IDoc

Intermediate Documents (IDocs) come from the Electronic Data Interchange (EDI) environment. The challenge here is to transfer documents (such as purchase orders) electronically from one application system to another, possibly very remote, system. To do so, the structures of these documents first had to be defined for business purposes. This resulted in the development of IDocs, or more precisely, IDoc types. Secondly, a technique for processing these documents in the SAP ERP system had to be developed, namely, inbound processing. As you'll see in Chapter 7, you can also use this technique for data migration.

An important connection exists between BAPIs and IDocs. At the touch of a button, you can generate an IDoc type from a BAPI in the SAP ERP system. SAP already supplies the generated IDoc types for some BAPIs. In general, inbound processing of IDocs involves the following sequence: The data received in an IDoc is passed on to the corresponding BAPI, which updates the data in the SAP ERP system. This process is described in more detail in Chapter 7.

3.2.5 Verifying the Data

Of course, once the legacy data has been imported into the SAP ERP system, you want to ensure that the process is complete and accurate. Unfortunately, there is no blanket solution for measuring the success of a data migration.

Ultimately, you will have to rely on random samples and plausibility checks, such as comparing key figures (balances, for example), or comparing the number of records between the legacy system and the SAP ERP system. Connection between BAPIs and IDocs

No blanket solution

3.3 Overview of Technical Procedures for Data Migration

This chapter concludes with a summary of the major data migration techniques introduced in this book.

3.3.1 Batch Input

As mentioned in Section 3.2.4, *batch input* is both a type of standard ERP interface and a procedure for data migration. Batch input can be used for data migration in two ways:

Standard batch input programs

The SAP ERP system contains various batch input programs that transform prepared legacy data into a format that dialog transactions can process. These programs are called *standard batch input programs*.

Batch input recording

In addition to the standard programs, the SAP ERP system enables you to record the process flow of a dialog transaction and generate an ABAP program from this recording at the touch of a button. While these generated programs theoretically work just like standard batch input programs, they lack the flexibility to react to changing screen sequences. The clear benefit of a batch input recording is that you deal only with the input fields of a dialog transaction that are relevant for your specific case. You can ignore all other input fields.

3.3.2 Extended Computer Aided Test Tool

Migrating data with the test tool

The *Extended Computer Aided Test Tool* (eCATT) is a tool that was originally developed to test business processes. Technically, a business process always consists of a sequence of dialog transactions. To avoid having to enter each transaction manually, the eCATT enables you to automate transaction processing and supply the transactions with appropriate values. Ultimately, the data generated in this manner forms the foundation for the system, integration, and mass tests that are essential to every ERP implementation project.

But, where is the connection to data migration? Data migration also involves creating data records with a specific transaction - such as

Transaction FK01 (*Create Vendor*) — and copying them automatically to SAP ERP. If you use the eCATT for data migration, you aren't interested in whether the dialog transactions respond accordingly with your expectations; you simply assume that this is where things are in the migration process. At this point, you are concerned only with transferring the legacy data to SAP ERP automatically, simply, and reliably.

3.3.3 Legacy System Migration Workbench

The *Legacy System Migration Workbench* (LSM Workbench) is an ERPbased tool for the one-time or periodic transfer of data from legacy systems to SAP ERP systems. It provides easy-to-use functions to convert legacy data and import it into the SAP ERP system, using standard ERP interfaces. The LSM Workbench is based on the following principles:

- Business data objects are migrated, not individual tables or field contents.
- ► The most frequent conversion tasks (see Section 3.2.3) are predefined and available at the touch of a button. Conversions can be added via the suitable ABAP statements.
- ► No ready-made conversion programs are provided. Instead, the conversion programs are generated from the defined conversion rules.
- ► Quality and consistency of the data imported into the SAP ERP system are more important than speed and throughput. Therefore, only the standard ERP interfaces are used.
- Conversion rules that have been defined once can be reused.

These three techniques are introduced in exact detail in the following chapters. Principles of the LSM Workbench

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