Introduction

The Company SAP

What does SAP stand for?

- Systeme, Anwendungen und Produkte in der Datenverarbeitung
- Systems, Applications and Products in Data Processing

Some Figures

- Revenues in 2003: € 7.0 billion
- 79,800 installations
- More than 23,400 companies run SAP
- 30,945 SAP employees (June 2004)
- 12 million users in 120+ countries
- More than 1,500 partners
- More than 60,000 students work with SAP software in business management classes in over 500 institutions globally
Introduction

The System R/3

Characteristics of an ERP-System

„All combined in one“

- **ERP (Enterprise Resource Planning):** Suite of integrated corporate wide software applications that drives manufacturing, financial, distribution, human resources, and other business functions in real time.

- **Important:** One integrated system with real time information. If information is not accurate, the system is not reliable.
Hands On 1

(You know the table)

There are (always) several ways to get somewhere

1. Enter the transaction code **SE16** and press Enter.
2. Double click in the Easy Access Menu.
3. Enter a table name (e.g. MARA) and press Enter.
You don't know the table name – search for it!

Press the search button

Search in the Information System

SAP (always) gives you a lot of choices ...

e.g. enter *Material* 

The expressions are case sensitive
The results for *material* are not the same as for *Material* !!!

Keep the max. of hits in mind!
Well, now it is easy to find – or?

From the Table to the Data

Data Browser: Table MARA: Selection Screen

(define a filter and) execute with

Data Browser: Table MARA Select Entries 200
Hands On 2

(You know nearly nothing)

Welcome to the club ;-)
From the Technical Info to the Table / Structure Components

**Dictionary: Display Structure**

- **Structure**: RMG1
- **Active**: Yes
- **Short Description**: Mat. Master Maintenance: Initial Parameters - Orig. Material

**Attributes**

- Component
- RT
- Component Type
- Data Type
- Length
- Description
- Short Description

**Components**

- **Component**: MATNR
  - **Type**: MATNR
  - **Data Type**: CHAR
  - **Length**: 18
  - **Description**: Material Number

From the Components to the Table

**Dictionary: Display Table**

- **Transp. table**: MARH
- **Partly active**: No

**Attributes**

- Field
- Key field
- Data element
- Data T
- Length
- Description
- Short Description

- **Field**: MATT
  - **Key field**: Yes
  - **Data element**: MATT
  - **Data T**: CHAR
  - **Length**: 18
  - **Description**: Material Number

**Ann.**: Further interesting displays with (Object List) and (Graphic).
From the Table to the Data

**Data Browser: Table MARA Selection Screen**

<table>
<thead>
<tr>
<th>MATNR</th>
<th>ERSIDA</th>
<th>ERSIDM</th>
<th>WRTMTRY</th>
<th>AMTIANG</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Width of Output List: 258
Maximum No. of Hits: 298

**Data Browser: Table MARA Select Entries**

Table: MARA
Displayed Fields: 23 of 150 Fixed columns:
List width: 025a

<table>
<thead>
<tr>
<th>REZID</th>
<th>MATNR</th>
<th>WRTMTRY</th>
<th>AMTIANG</th>
<th>KEEVS</th>
<th>KEB</th>
<th>PESTAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>103</td>
<td>23</td>
<td>23</td>
<td>K</td>
<td>KEB</td>
<td>KEB</td>
</tr>
<tr>
<td>11</td>
<td>103</td>
<td>23</td>
<td>23</td>
<td>KEEVS</td>
<td>KEB</td>
<td>KEB</td>
</tr>
<tr>
<td>11</td>
<td>103</td>
<td>23</td>
<td>23</td>
<td>KEEVS</td>
<td>KEB</td>
<td>KEB</td>
</tr>
<tr>
<td>11</td>
<td>103</td>
<td>23</td>
<td>23</td>
<td>KEEVS</td>
<td>KEB</td>
<td>KEB</td>
</tr>
</tbody>
</table>

The Link between Application and Database

(What Academics love -> some Theory)
How does it work?

- Business Applications
- ABAP Dictionary

Programs of the R/3-System

- native SQL Module
- Open SQL Module
- Database specific Layer

Database-Interface

Relational Database

It's a Repository - what is it good for?

- Central and redundant free **information storage** for all application- and systemdata in the R/3-system
- Description of the **logical structure** of e.g.
  - Tables,
  - Views,
  - Dataelements,
  - Domains,
  - Structures
  and their definition in the structures of the underlying relational database.
- Avoidance of **redundancy**
  (All components of the runtime environment, e.g. the business applications or the database interface, fetch their information about these objects directly from the ABAP Dictionary.)
- An **active Dictionary** that is completely integrated in the **ABAP Workbench**.
The Link between Application and Database

ABAP Dictionary (2/2)

An Overview

- ABAP Programs
- Dokumentation
- Online Help

ABAP Dictionary

Dynampros

Databsetables ...

Classes

The Link between Application and Database

Data-Elements, Domains, Data-Types ...

Complex but logical

Tables + Fields

<table>
<thead>
<tr>
<th>wage-payment</th>
<th>bookings</th>
<th>account</th>
</tr>
</thead>
<tbody>
<tr>
<td>account no.</td>
<td>booking no.</td>
<td>account no.</td>
</tr>
<tr>
<td>month</td>
<td>amount</td>
<td>balance</td>
</tr>
<tr>
<td>amount</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data-Element
(semantic domain)

booking amount
[$]

balance
[$]

Domain
(technical domain)

amount with 2 decimals
[$]

SAP Basis-Data-Typ
CURR (12 digits, 2 decimals)

Database Basis-Data-Typ
DEC
Data(base)organisation in the R/3-System

The Link between Application and Database

SAP-Reference-model (conceptual level)
- Accounting
- Logistics
- HR

Example:
- Entitytyp 12127 Vendor-Invoice-Posting

ABAP/4 Dictionary (logical level)
- Views
- normalised tables

Relational Database (physical level)
- Table RFBLG (physical table)
- Table BSEG (clustertable)
  Accounting Document Segment

The Link between Application and Database

Tabletypes in the R/3-Repository

Transparent Tables
- 1:1 relation -> one logical table matches one database table
- businessdata

39,047 transparent tables in SAP R/3 4.7 (Enterprise)
### Pool-Tables

- Several SAP-tables with the same pattern resolve in one database table.
- In the database every tuple has the information to which SAP-table it belongs.

**SAP-Tabellen**

![Diagram of Pool-Tables]

**DB-Tabellen**

2,022 pool tables in SAP R/3 4.7 (Enterprise)

### Cluster-Tabellen

- Several tables that belong together logically are stored in one database table (objectwise saving).
- Prerequisite: data records belonging together (tuple of the SAP-tables) can be identified via the same primary key.

**SAP-Tabellen**

![Diagram of Cluster-Tabellen]

**DB-Tabellen**

75 cluster tables in SAP R/3 4.7 (Enterprise)
Internal Tables

- Datastructure, that is only available during the runtime of a program
- Can be linked to several programs
- Similar to a view

Hands On 3

(A look to the SAP-Repository)

a bit deep-diving ;-)
First Step into the SAP-Repository

Let’s get into IT

enter the transaction code SE84 and press Enter

do double click in the Easy Access Menu

The Way to the Data Models (1/6)

Chose one out of 26,959 Data Models*!

* for R/3 4.7 (Enterprise)
Only 125 Data Models containing "order"

The Way to the Data 3
A Look at the Data Models (2/6)

Rather boring, but a good starting point ...

have a look at the graphics

have a look at the hierarchy
A Look at the Data Models (4/6)

23 Representations (Entity Types) belonging to a Sales Order

![Diagram of Data Model Hierarchy (Standard View)]

Display Data Model: Hierarchy (Standard View)

Select an entity type and press Dictionary

A Look at the Data Models (5/6)

And here is the graphical version ;-)
A Look at the Data Models (6/6)

You should recognize some of this!

You can place the cursor in the field of a table and press the Data Browser button.

Run the Report via

A Look at the Entity Types (1/6)

Chose one out of 4,622 Entity Types*!

For example, enter *order* and execute.

* for R/3 4.7 (Enterprise)
A Look at the Entity Types (2/6)

Over 200 Entity Types containing „order“

The Way to the Data 3

A Look at the Entity Types (3/6)

Again rather boring, but a good starting point ...

- double click
- have a look at the dictionary
- have a look at the relations
- have a look at the where used
The incoming relationships with their cardinality

What does C:CN... stand for?

Try a double click :-)

The Dictionary (you should know this!)

Display Table/View Assignments

View: 1 / 2
A Look at the Entity Types (6/6)

Where is this Entity used?

Where used Entity type 16002 in Data models (18 Hits)

Where used Entity type 16002 in Database tables (3 Hits)

That's „IT“

I hope it was a bit interesting and you learned something you can utilize in the future.