FEU INSTITUTE OF TECHNOLOGY
COLLEGE OF ENGINEERING • COLLEGE OF COMPUTER STUDIES

ITSE333A ABAP

Lesson 4: Database Accesses

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Agenda

1. Use domain, data elements and entry help
2. Use of ABAP Dictionary (SE11)
3. Create Domain and data element

Use domains, data elements and entry helps

- **Short description:** Use the data dictionary to create an entry help for a new table

- Please start the ABAP dictionary from the SAP Easy Access Menu by using the following menu path:

- **Tools • ABAP Workbench • Development • ABAP Dictionary**
- You may also use transaction code **SE11** for direct access

- In the first step you will create a new domain as this is the highest hierarchy level in the ABAP dictionary. Your new domain is named '**ZY_##_CHAR30**'. Select the '**Domain**' radio button and type in the name into the input field. Then click on the '**Create**' button. The SAP system will bring you directly to the domain details where you have to define a short text and a data type. You can choose a short text on your own. We want to use the data type '**CHAR**' in our domain and the number of characters is limited to '**30**'.

Dictionary: Maintain Domain

Domain	ZY_99_CHAR30	New(Revised)
Short Text	Domain for character with length of 30	

Attributes | Definition | Value range

Formatting

Data type	CHAR	Character String
No. characters	30	
Decimal places	0	

Output characteristics

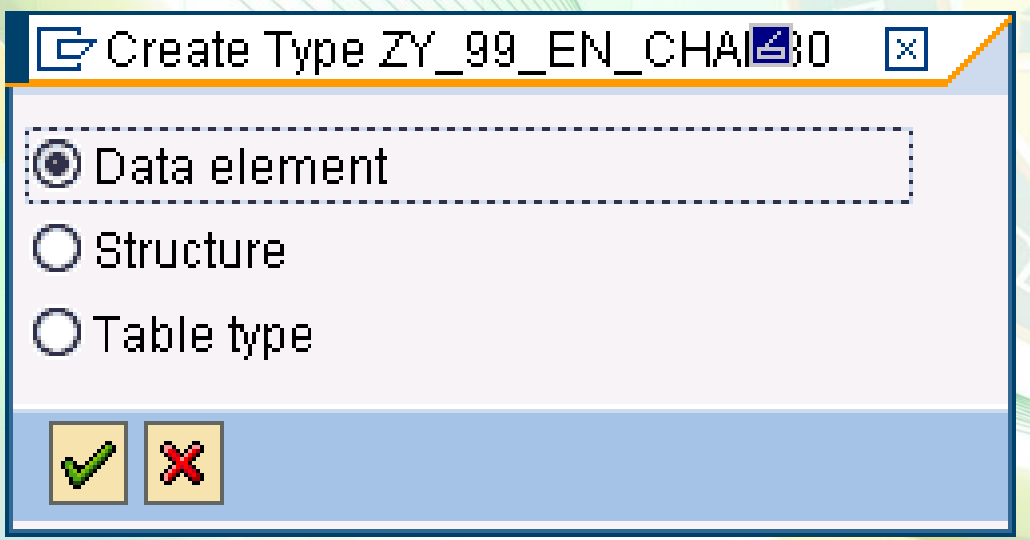
Output length	30
Convers. routine	

☐ Sign

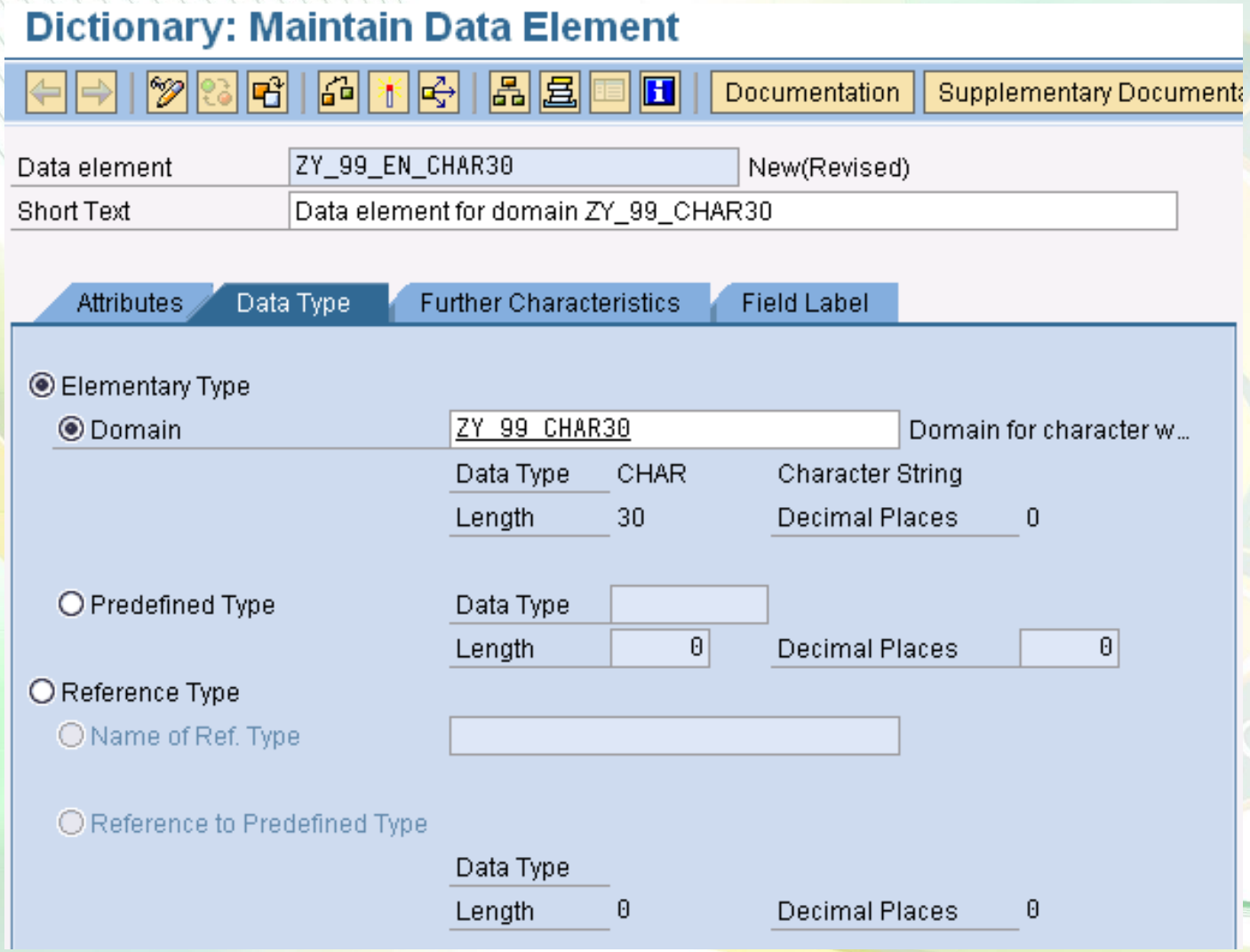
☑ Lowercase

- Now save and activate your new domain. Return to the ABAP dictionary by pressing the '**Back**' button (F3).

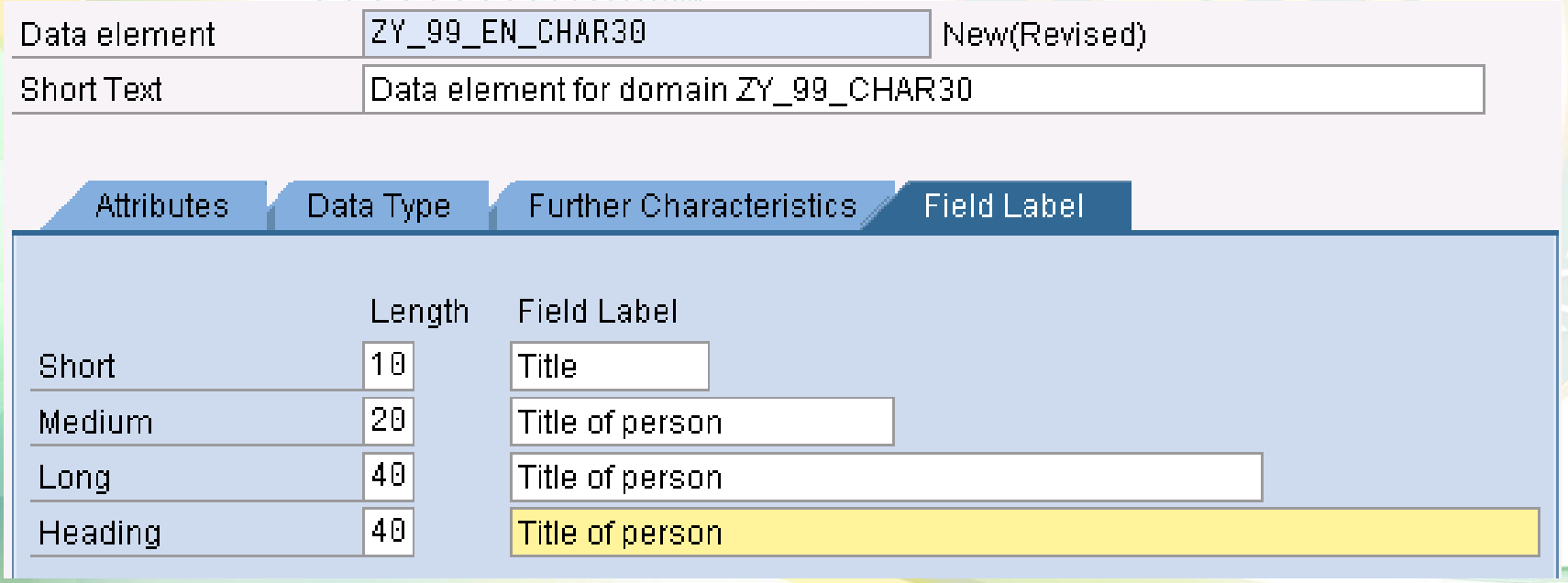
- In the next step you want to create a new data type named '**ZY_##_EN_CHAR30**'. Select the radio button '**Data type**' and type in the name of your new data type.



- The system asks you now if you want to create a Data element or a structure or a table type. Please select the first option '**Data element**'. Maintain the short text and the domain of your new data element. Choose the domain you created in the first step of this task.


Dictionary: Maintain Data Element
Documentation
Supplementary Documenta
Data element
ZY_99_EN_CHAR30
New(Revised)
Short Text
Data element for domain ZY_99_CHAR30
Attributes
Data Type
Further Characteristics
Field Label
Elementary Type
Domain
ZY_99_CHAR30
Domain for character w...
Data Type
CHAR
Character String
Length
30
Decimal Places
0
Predefined Type
Data Type
Length
0
Decimal Places
0
Reference Type
Name of Ref. Type
Reference to Predefined Type
Data Type
Length
0
Decimal Places
0

- Switch to the '**Field Label**' tab and maintain the field labels, too. You can define the maximum length of each field label.



- Save and activate your new data element using your transport request and package.

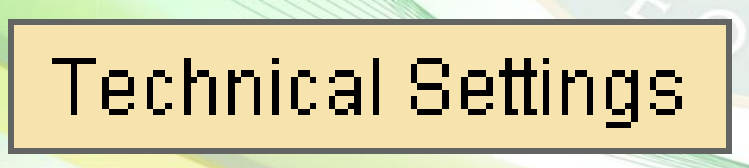
- The next step is the creation of your database table. The table will contain some exemplary titles of persons and will therefore function as a check table. The name of the new table is '**ZY##_TITLE'**. Please note that because of naming conventions there is no underscore after ZY. Maintain the short text and then choose '**Application table (master and transaction data)**' as the '**Delivery Class**' and '**X Display/Maintenance Allowed**' as the value for '**Data Browser/Table View Maint.**'.

Transp. Table	ZY99_TITLE	New(Revised)
Short Text	Title table	

Attributes | Delivery and Maintenance | Fields | Entry help/check | Currency/Quantity Fields

Delivery Class	A	Application table (master and transaction data)
Data Browser/Table View Maint.	K	Display/Maintenance Allowed

- Switch to tab '**Fields**' to maintain the fields of your table and define the first field '**Title**'. The title field is also used as the primary key. So select the checkbox '**Key**'. For the first field you have to define the data element. Here you choose the created data element '**ZY_##_EN_CHAR30'**. Please use the F4 help to avoid any typing failures.
- Now switch to the technical settings of your table by using the button:



- The technical settings describe how the table will be stored later on and if data records of the table are buffered or not. The maintenance of the data class is mandatory: please choose '**APPL0**' and the size category '**0**'.

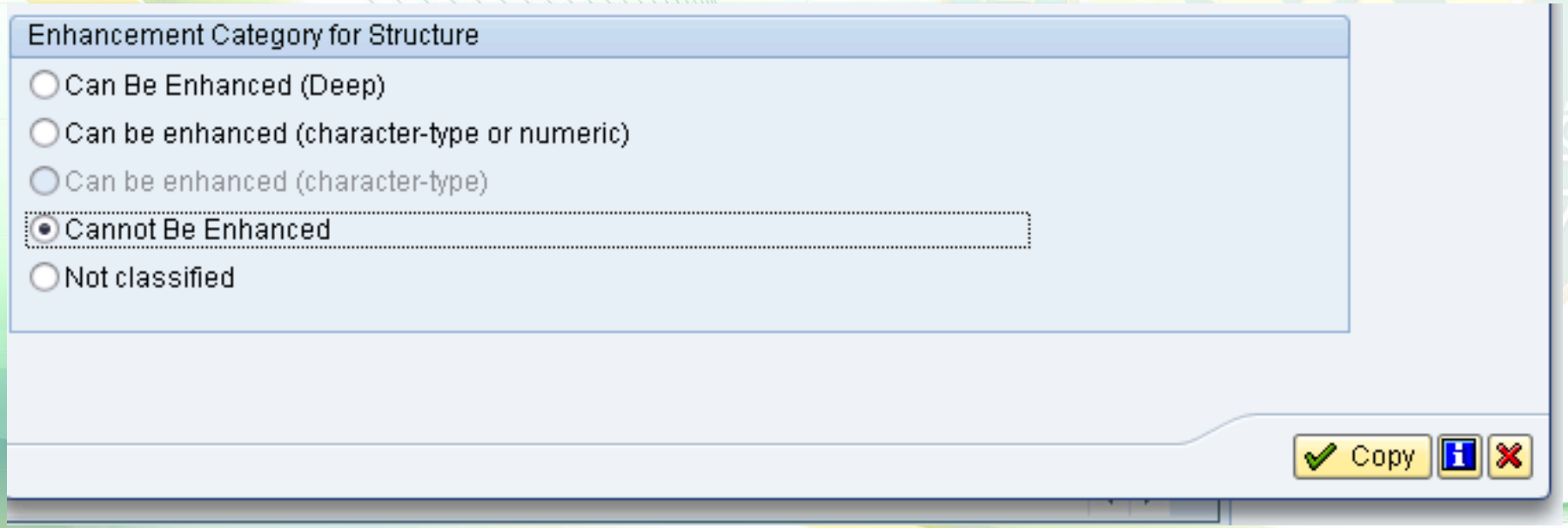
Name	ZY99_TITLE	Transparent Table
Short text	Title table	
Last Change	UCCABAP-99	01.10.2008
Status	New	Not saved

Logical storage parameters

Data class	APPL0	Master data, transparent tables
Size category	0	Data records expected: 0 to 20.000

- Leave the rest of the settings as they are and save the technical settings. After you saving the settings, go back (F3) to the table maintenance. In the last step you have to care for the Enhancement Category. This category defines whether the table can be enhanced later on or not. Define the category using the following menu path:
-

- **Extras • Enhancement Category…**
- In the popup coming up, please choose the option ‘Cannot Be Enhanced’.



- Choose Copy to go on. Save everything and activate your table now.
-
- In the next step you will enter some data records into the table. This can be done easily using the '**Data browser**'. The Data browser can be accessed via the menu path:

- **Utilities • Table Contents • Create Entries**
- The SAP system jumps directly to a new program where you can add new data records into the table. To add a new entry into the table, type in the title into the input field and then press the '**Save**' button.

- Add the following titles: PhD., Dr., Prof. Dr., Prof. Dr. h.c. mult. After you entered all titles please go back to the data dictionary.

Perform the following:

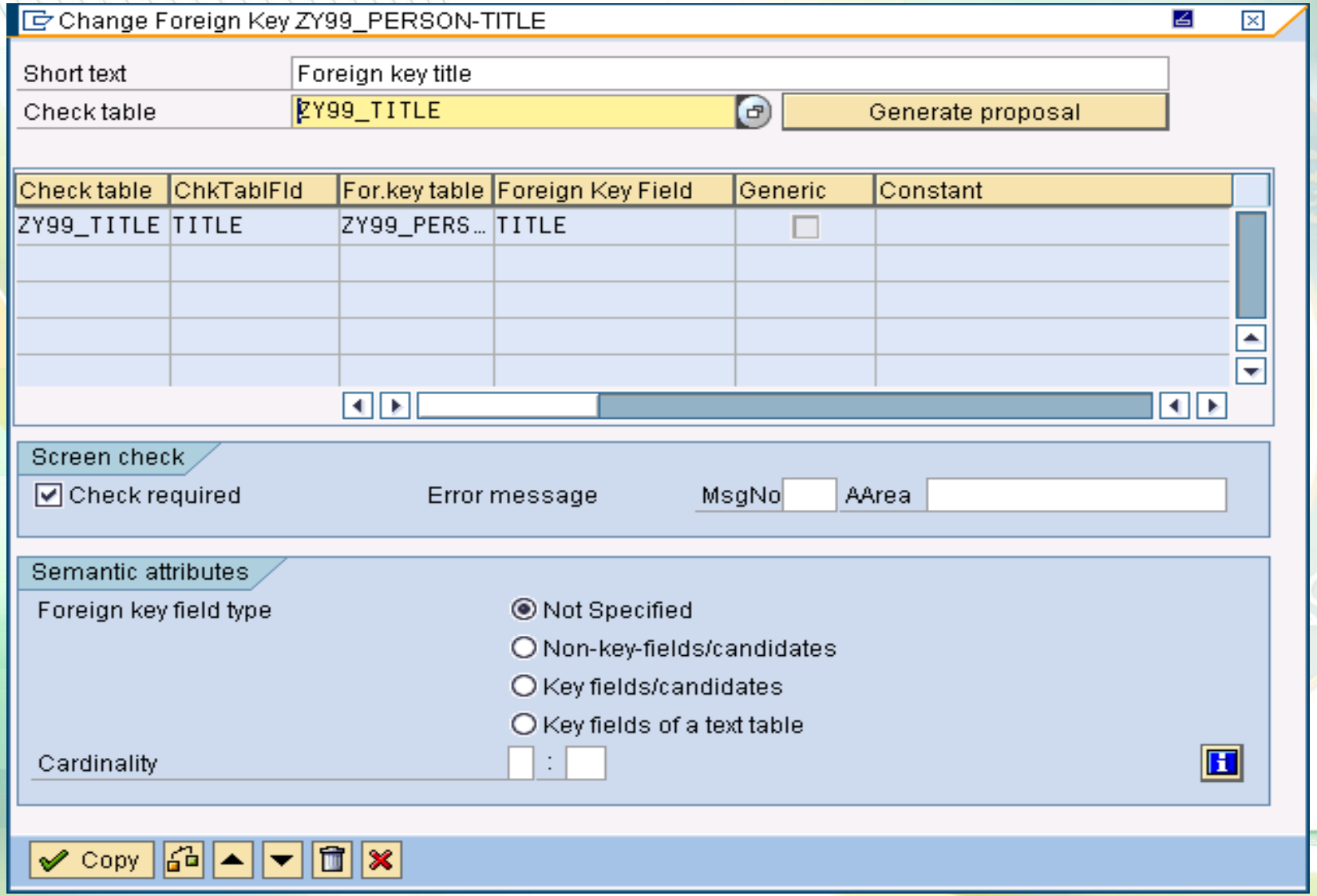
Transp. Table	ZY99_PERSON	New
Short Text	Table with personal information	

Attributes | Delivery and Maintenance | Fields | Entry help/check | Currency/Quantity Fields

Srch Help | Predefined Type

Field	Key	Initi...	Data element	Data Ty...	Length	Deci...	Short Text
PERSONID	☑	☐		INT4	10	0	Primary key of table
NAME	☐	☐		CHAR	40	0	First name of person
FAMILY_NAME	☐	☐		CHAR	40	0	Family name of person
TITLE	☐	☐	ZY_99_EN_CHAR30	CHAR	30	0	Data element for domain ZY_99_CHAR30

- **TITLE**’ and press the ‘**Foreign Key**‘ button in the toolbar. The SAP system comes up with a pop-up and asks you for the check table. Please select your title table ‘**ZY99_TITLE**’ and press ‘**Enter**’. The system will automatically read the repository information and will propose a foreign key definition using the field names from both tables.


Change Foreign Key ZY99_PERSON-TITLE
Short text
Foreign key title
Check table
ZY99_TITLE
Generate proposal
Check table
ChkTablFld
For.key table
Foreign Key Field
Generic
Constant
ZY99_TITLE
TITLE
ZY99_PERS...
TITLE
Screen check
Check required
Error message
MsgNo
AArea
Semantic attributes
Foreign key field type
Not Specified
Non-key-fields/candidates
Key fields/candidates
Key fields of a text table
Cardinality
Copy

- Please save and activate your new table after you maintained the technical settings. To prove if the check table was defined successfully you will now create a program. Leave the data dictionary.

- **Tools • ABAP Workbench • Overview • Object Navigator**
- You may also use the transaction code **SE80** for direct access.
- Create a new program which is named '**ZY_##_PERSON**'. Use the following code fragment to define parameters in your program:

```
*&---------------------------------------------------------------------*
*& Report  ZY_99_PERSON
*&
*&---------------------------------------------------------------------*
*&
*&
*&---------------------------------------------------------------------*

REPORT  ZY_99_PERSON.

parameters: pa_title type zy99_person-title, pa_name type zy99_person-name, pa_fam type zy99_person-family_name.
```

Save, check and activate your new program. Now when testing your new program the SAP system comes up with an entry help on the '**PA_TITLE**' input field. This is because of the foreign key definition. All the values come from the title table.

Agenda

1. Data dictionary
2. SAP flight example
3. Database operations in SAP
4. SAP OpenSQL
5. Types of database changes
6. Types of entry help

Data dictionary

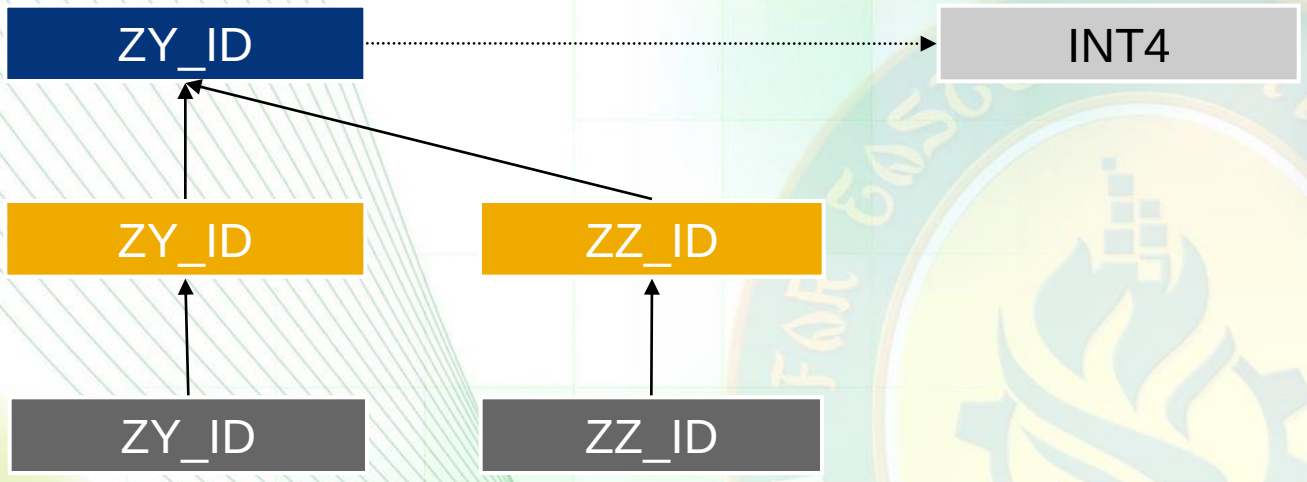
- Data dictionary = global directory for data types
- Assignment of help texts and explanations for data types in different languages
- ERM can be shown as a figure automatically
- Most important objects: structure, table, data element and domain

Data dictionary

Domain

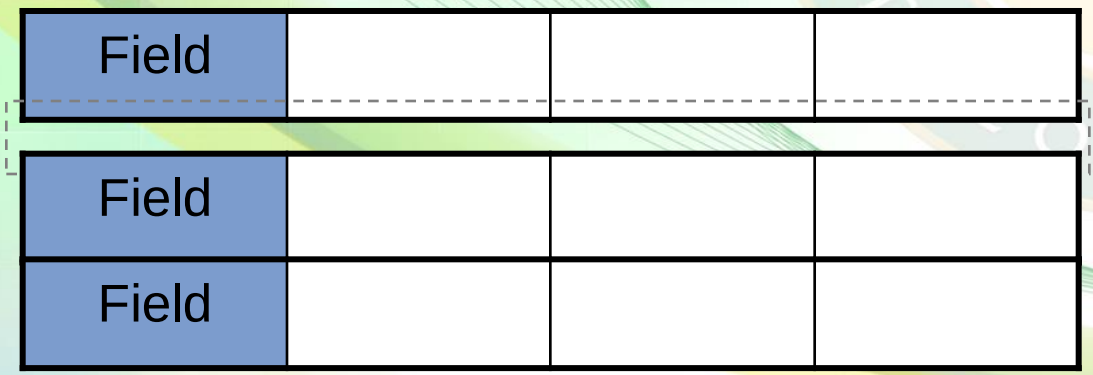
Data element

Field



Structure

Table



Data dictionary

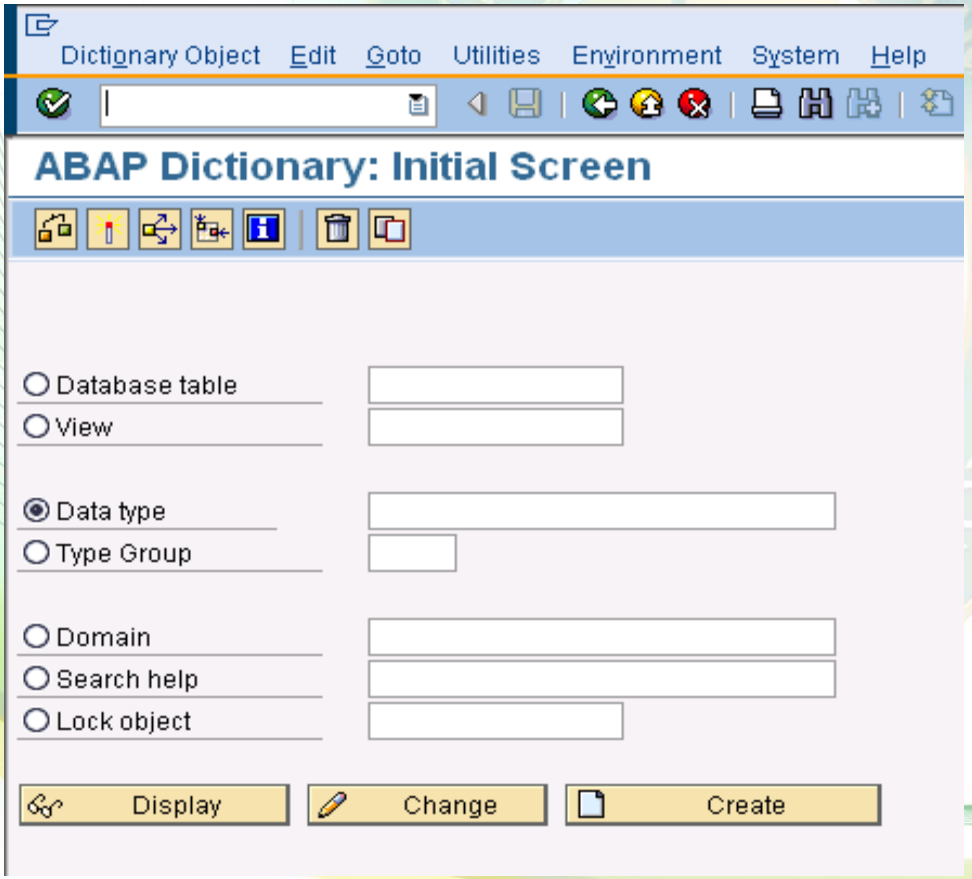
- Menu path: **Tools • ABAP Workbench • Development • Dictionary**
- TA SE11
- View, edit, delete, create tables, data types, domains definitions etc.
- Tables and views from the ABAP dictionary represent tables and views from the database
- User interface are generated automatically when changing views, tables etc.
- Table may be changed after they are created without losing data
- SAP tables may be extended by `APPEND` structures

Data browser

- Menu path: **Tools • ABAP Workbench • Overview • Data Browser**
- TA SE16
- View table content
- Add new entries to tables when adding is permitted for the table
- Browse the entry help table content
- Copy table content to transport request
- Download table content

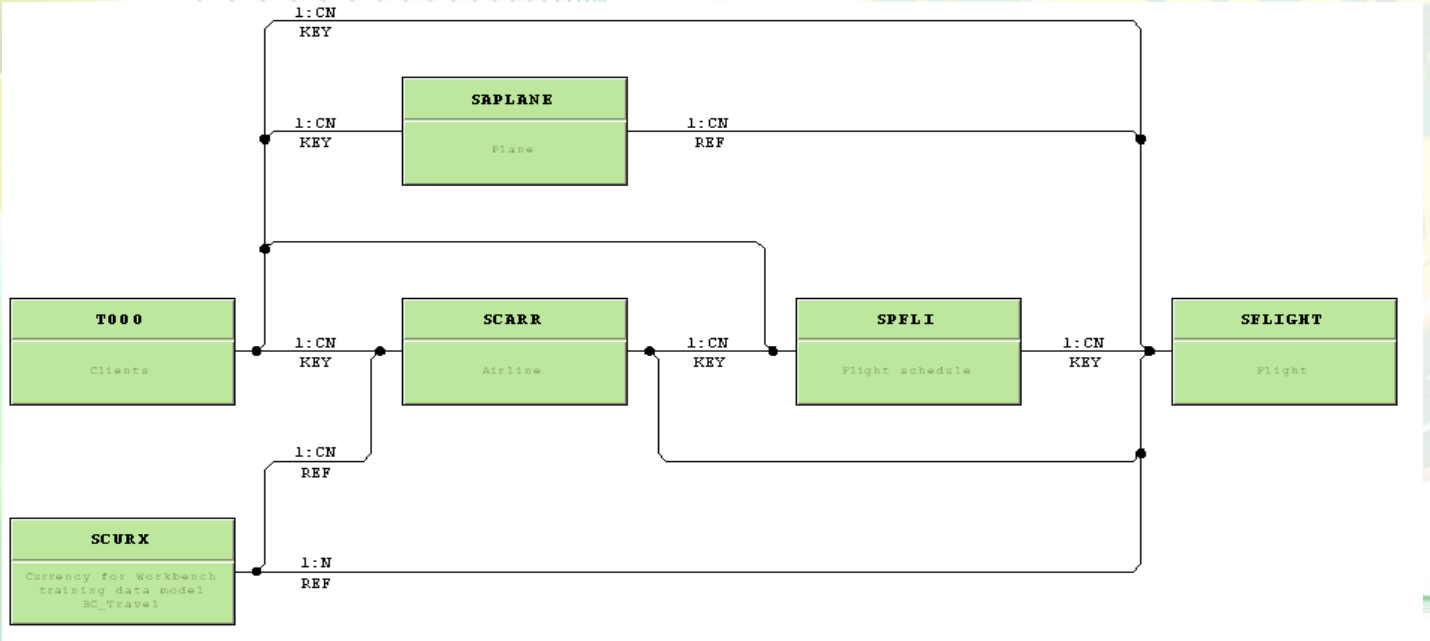
Overview about all objects

- Database table
- View
- Data type
  - Data element
  - Structure
  - Database table
  - Table types
  - Views
  - Class / interface
- Type group
- Domain
- Search help
- Lock object



Visualization

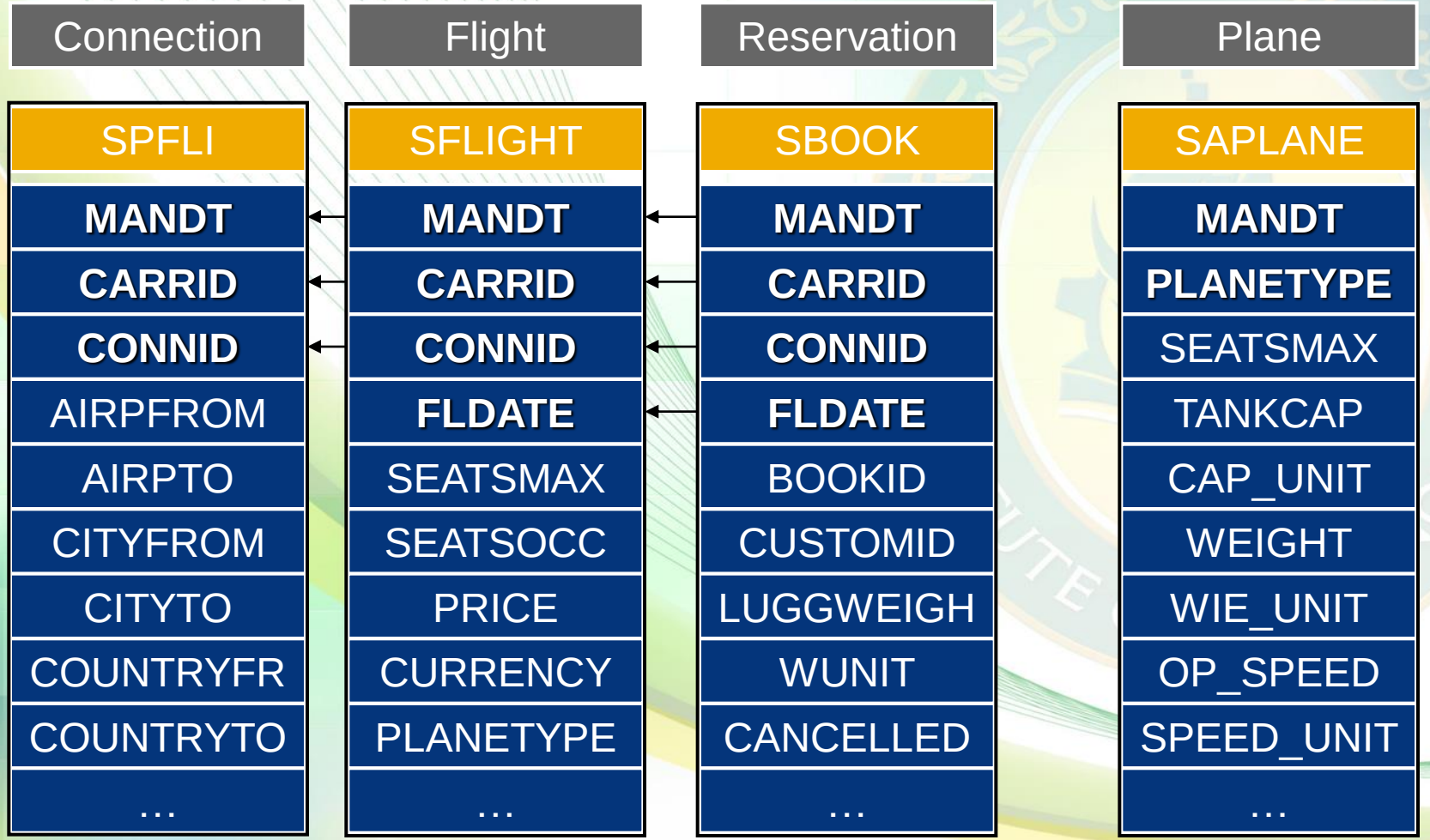
- Foreign key relationships can be visualized in data dictionary
- Table SFLIGHT



SAP flight example

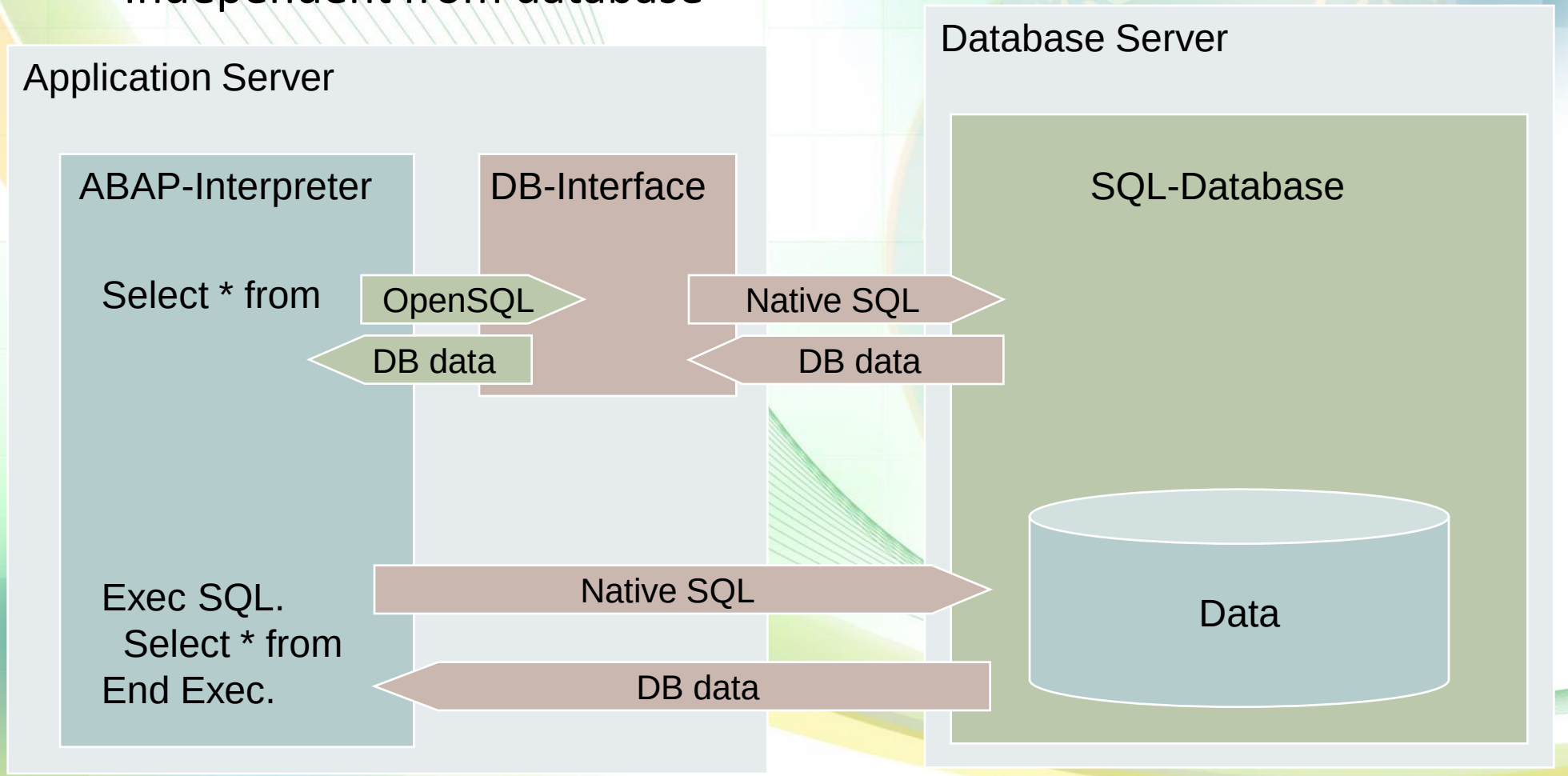
- Created and maintained by SAP to demonstrate database operations
- Contains exercise data for airline, flight connection number, flight date, airfare etc.
- Report for data generation:
  `S_FLIGHT_MODEL_DATA_GENERATION`
- SAP trainings, examples from books build refer to the flight example

SAP flight example – table structure



SAP OpenSQL

- Independent from database



OpenSQL instructions

- Select:
  - SELECT / SELECT SINGLE
  - * / field 1 ..field n /
  - FROM table / view
  - INTO structure / internal table
  - WHERE condition
- Aggregation:
  - MAX, MIN, AVG
  - SUM, COUNT
- Joins:
  - Left outer join
  - Inner join
  - View

Procedure for database access

General:

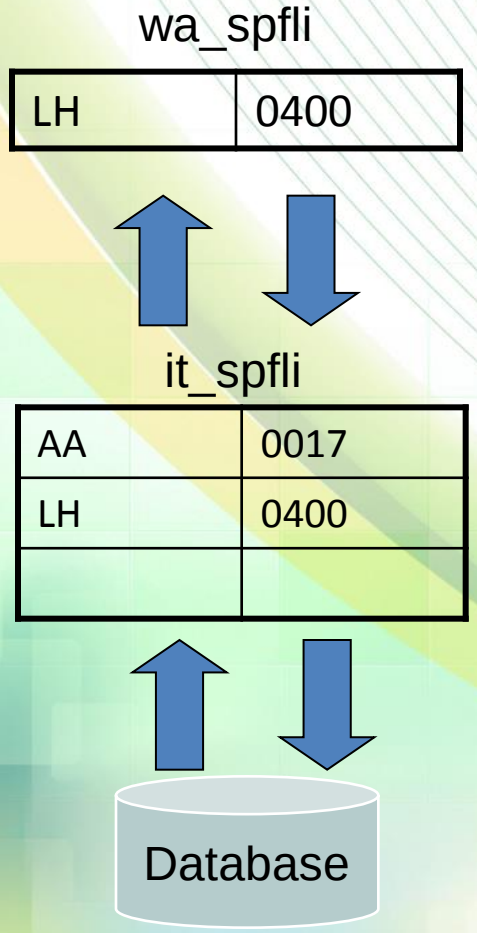
- Be specific to decrease the load on the database
- Access to database takes 10,000 time longer than access to buffers
- Avoid table scans, use indexes

Procedure:

1. Read database data into internal tables
   - Internal tables are tables for holding data during runtime
2. Change data per row
   - Use workareas to hold one row of the table and change data in the workarea
3. Write changes back to database

Procedure for database access

Internal tables and workareas:



Workarea
(one row)

- Use the workarea to modify one data set

Internal table
(selected content)

- Use the internal table to store the selected database content temporarily
- Internal tables are deleted after program is finished

Database table
(whole content)

- Use the database to read/write data

Types of database changes

Modify instruction:

```
MODIFY <dbtable> [CLIENT SPECIFIED] FROM <workarea>.
MODIFY <dbtable> [CLIENT SPECIFIED] FROM TABLE
<internaltable>
```

- Modify = Update – the command updates the database table if the database table already contains dataset
- Modify = Insert – the command inserts new datasets into the database table

Delete instruction:

```
DELETE FROM <dbtable> WHERE [SQL statement].
```

Entry help

- Entry help uses a table in the background
- Predefined entry help for a table