



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

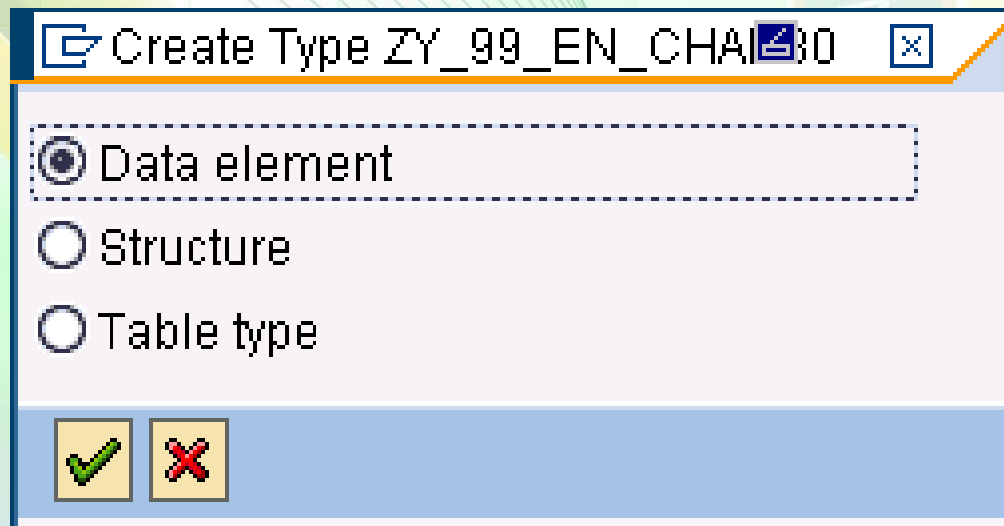


- Now save and activate your new domain. Return to the ABAP dictionary by pressing the '**Back**' button (F3).





- 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



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.

Data element	ZY_99_EN_CHAR30	New(Revised)
Short Text	Data element for domain ZY_99_CHAR30	

Attributes

Data Type

Further Characteristics

Field Label

	Length	Field Label
Short	10	Title
Medium	20	Title of person
Long	40	Title of person
Heading	40	Title of person



- 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.'**



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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.

X 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:

Technical Settings



- 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 '**APPLO**' and the size category '**0**'.



Name	ZY99_TITLE	Transparent Table
Shorttext	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'.

A screenshot of a software dialog box titled "Enhancement Category for Structure". It contains five radio button options: "Can Be Enhanced (Deep)", "Can be enhanced (character-type or numeric)", "Can be enhanced (character-type)", "Cannot Be Enhanced" (which is selected and highlighted with a dotted border), and "Not classified". At the bottom right of the dialog, there are three buttons: a green checkmark icon labeled "Copy", an information icon (i), and a red X icon (close).

Enhancement Category for Structure

☐ Can Be Enhanced (Deep)

☐ Can be enhanced (character-type or numeric)

☐ Can be enhanced (character-type)

☒ Cannot Be Enhanced

☐ Not classified

✓ Copy ⓘ ✕



- 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.

A screenshot of a software dialog box titled "Table ZY99_TITLE Insert". The dialog has a menu bar with "Table Entry", "Edit", "Goto", "Settings", and "Environment". Below the menu is a toolbar with a checkmark icon, a text input field, a folder icon, a left arrow icon, a right arrow icon, and a yellow circle icon. The main area of the dialog contains a "Reset" button and a text input field labeled "TITLE" with the text "PhD." entered. The background of the slide features a large, faint watermark of the FEU Institute of Technology logo.

- 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								
Field	Key	Initi...	Data element	Data Ty...	Length	Deci...	Short Text	
PERSONID	<input checked="" type="checkbox"/>	<input type="checkbox"/>		INT4	10	0	Primary key of table	
NAME	<input type="checkbox"/>	<input type="checkbox"/>		CHAR	40	0	First name of person	
FAMILY NAME	<input type="checkbox"/>	<input type="checkbox"/>		CHAR	40	0	Family name of person	
TITLE	<input type="checkbox"/>	<input type="checkbox"/>	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	ChkTabId	For.key table	Foreign Key Field	Generic	Constant
ZY99_TITLE	TITLE	ZY99_PERS...	TITLE	<input type="checkbox"/>	

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

ZY_ID

INT4

Data type

Data element

ZY_ID

ZZ_ID

Field

ZY_ID

ZZ_ID

Structure

Field			
-------	--	--	--

Table

Field			
Field			



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

A screenshot of the ABAP Dictionary: Initial Screen. The window has a menu bar with "Dictionary Object", "Edit", "Goto", "Utilities", "Environment", "System", and "Help". Below the menu bar is a toolbar with various icons. The main area is titled "ABAP Dictionary: Initial Screen" and contains a list of object types with radio buttons and input fields. The "Data type" option is selected. At the bottom, there are three buttons: "Display", "Change", and "Create".

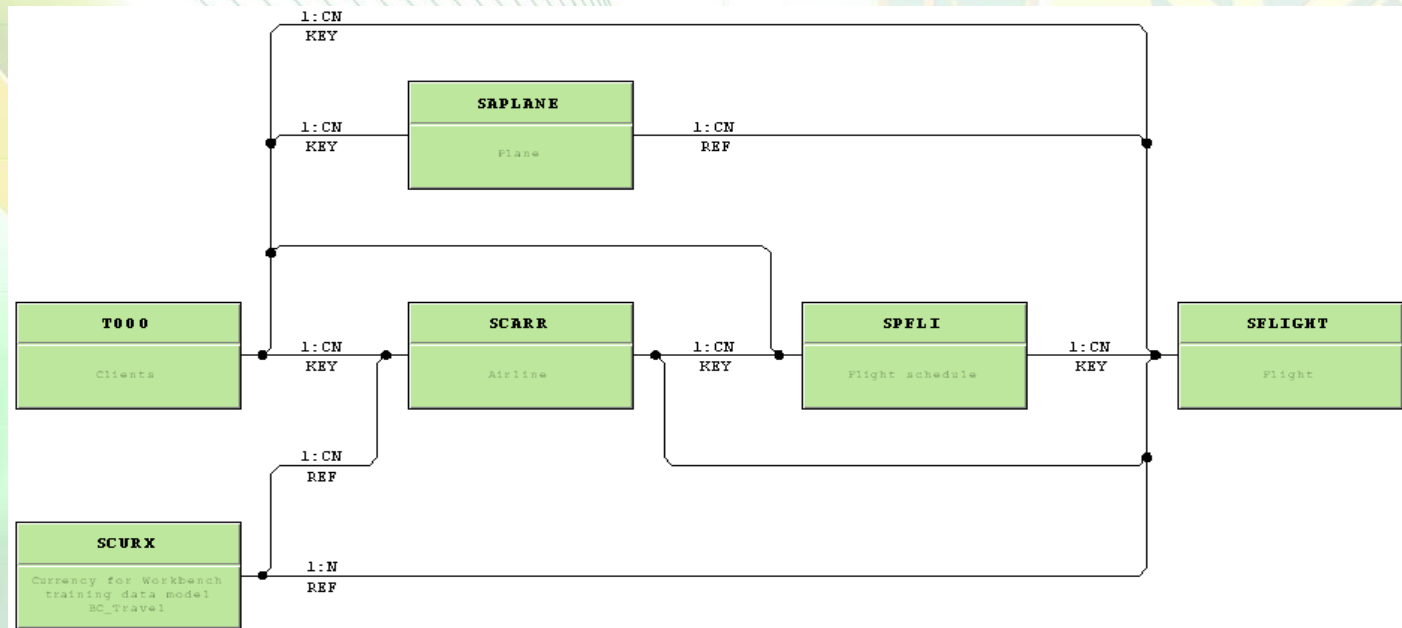
Object Type	Input Field
<input type="radio"/> Database table	
<input type="radio"/> View	
<input checked="" type="radio"/> Data type	
<input type="radio"/> Type Group	
<input type="radio"/> Domain	
<input type="radio"/> Search help	
<input type="radio"/> Lock object	

Display Change Create



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



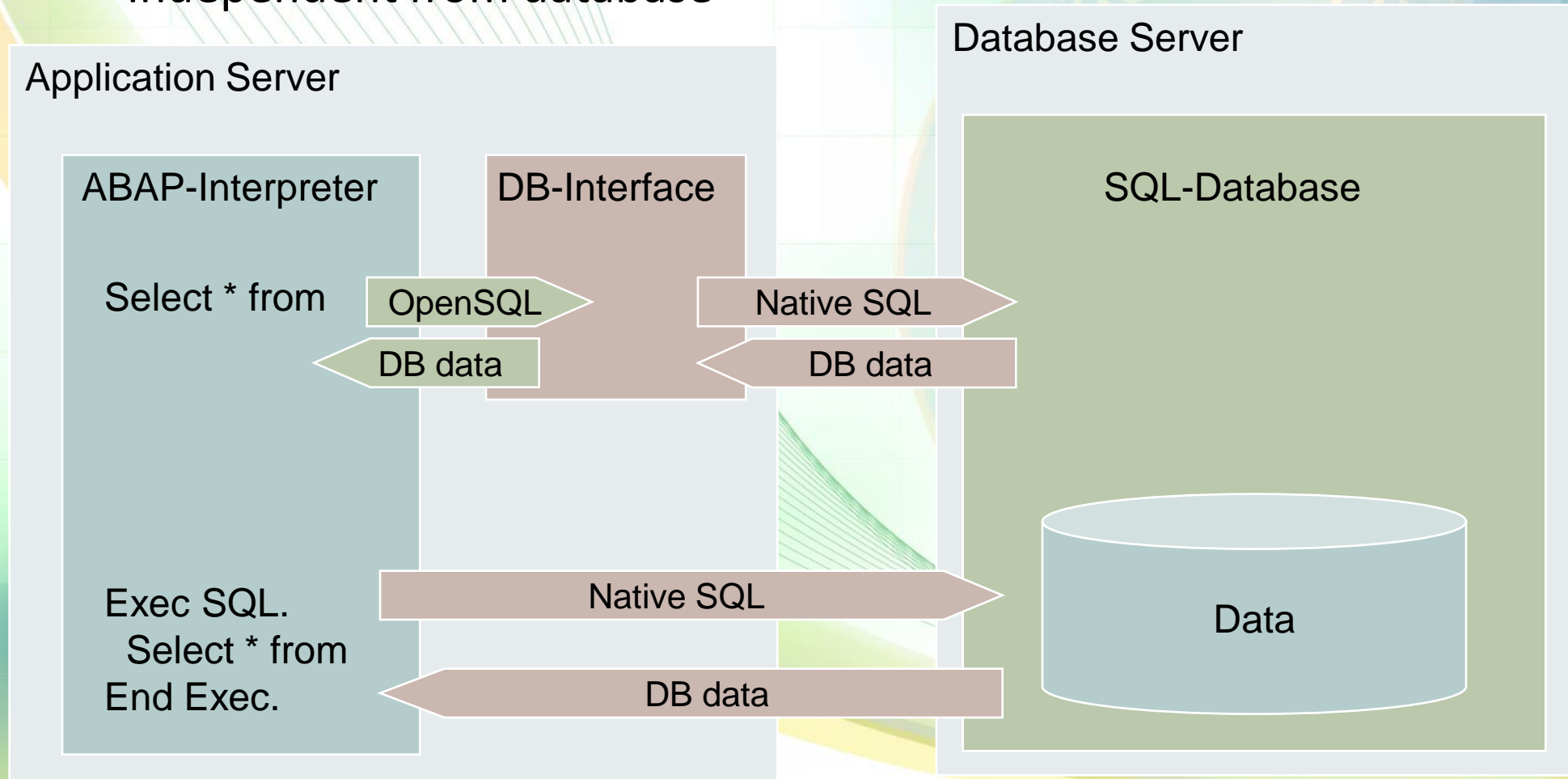
SAP flight example – table structure





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



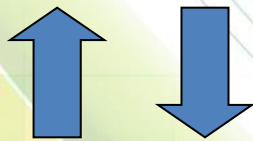
Procedure for database access

Internal tables and workareas:

wa_spfli

LH	0400
----	------

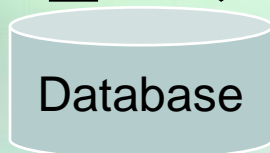
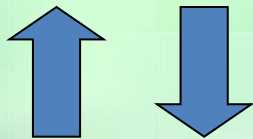
Workarea
(one row)



it_spfli

AA	0017
LH	0400

Internal table
(selected content)



Database table
(whole content)

- Use the workarea to modify one data set
- Use the internal table to store the selected database content temporarily
- Internal tables are deleted after program is finished
- 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

ABAP Dictionary: Initial Screen

The screenshot shows the 'ABAP Dictionary: Initial Screen' with a toolbar at the top. Below the toolbar, there are two radio buttons: 'Database table' (selected) and 'View'. To the right of these buttons is a text field containing 'SFLIGHT'. A red square highlights a small icon to the right of the 'SFLIGHT' text field.

Dictionary: Display Table

The screenshot shows the 'Dictionary: Display Table' interface. It has a toolbar at the top with various icons and buttons like 'Technical Settings', 'Indexes...', and 'Append Structure...'. Below the toolbar, there are fields for 'Transp. Table' (SFLIGHT) and 'Short Text' (Flight). The 'Active' checkbox is checked. Below these fields are tabs for 'Attributes', 'Delivery and Maintenance', 'Fields', 'Entry help/check', and 'Currency/Quantity Fields'. The 'Entry help/check' tab is selected. Below the tabs is a table with columns: Field, Data Ty..., Foreign ..., Check table, Origin of the input help, Srch Help, D..., and Domain. The table contains three rows of data. Red boxes highlight the 'Check table' and 'Srch Help' columns for the first three rows.

Field	Data Ty...	Foreign ...	Check table	Origin of the input help	Srch Help	D...	Domain
MANDT	CLNT	<input checked="" type="checkbox"/>	T000	Input help implemented with c...	H T000	<input type="checkbox"/>	MANDT
CARRID	CHAR	<input checked="" type="checkbox"/>	SCARR	Input help implemented with c...	H SCARR	<input type="checkbox"/>	S CARR ID
CONNID	NUMC	<input checked="" type="checkbox"/>	SPFLI	Input help implemented with c...	H SPFLI	<input type="checkbox"/>	S CONN ID