

ABAP Part III

Lesson 03: SmartForms

Lesson Objectives



After completing this lesson, participants will be able to -

- Know the Smartforms Architecture
- Work with SAP Form Builder
- Work with Texts, Addresses and Graphics
- Work with Data in Forms
- Work with Tables and Templates
- Flow Control
- Integrate SmartForms into Application Programs
- Work with Fonts and Bar Codes



Smart Forms-Introduction



Tool to create and maintain forms with minimal programming effort

Easy to create the form without much programming knowledge

Allows to execute simple modifications to the form and in the form logic by using graphical tools



Basic Features of SMARTFORM

Data retrieval and form logic are separated from each other.

Application program passes data to Smartform through Function module interface which is generated automatically on Smartform activation.

Reduces the implementation cost.



Key Benefits of SMARTFORM

Less Programming Efforts

Output of background graphics, for form design

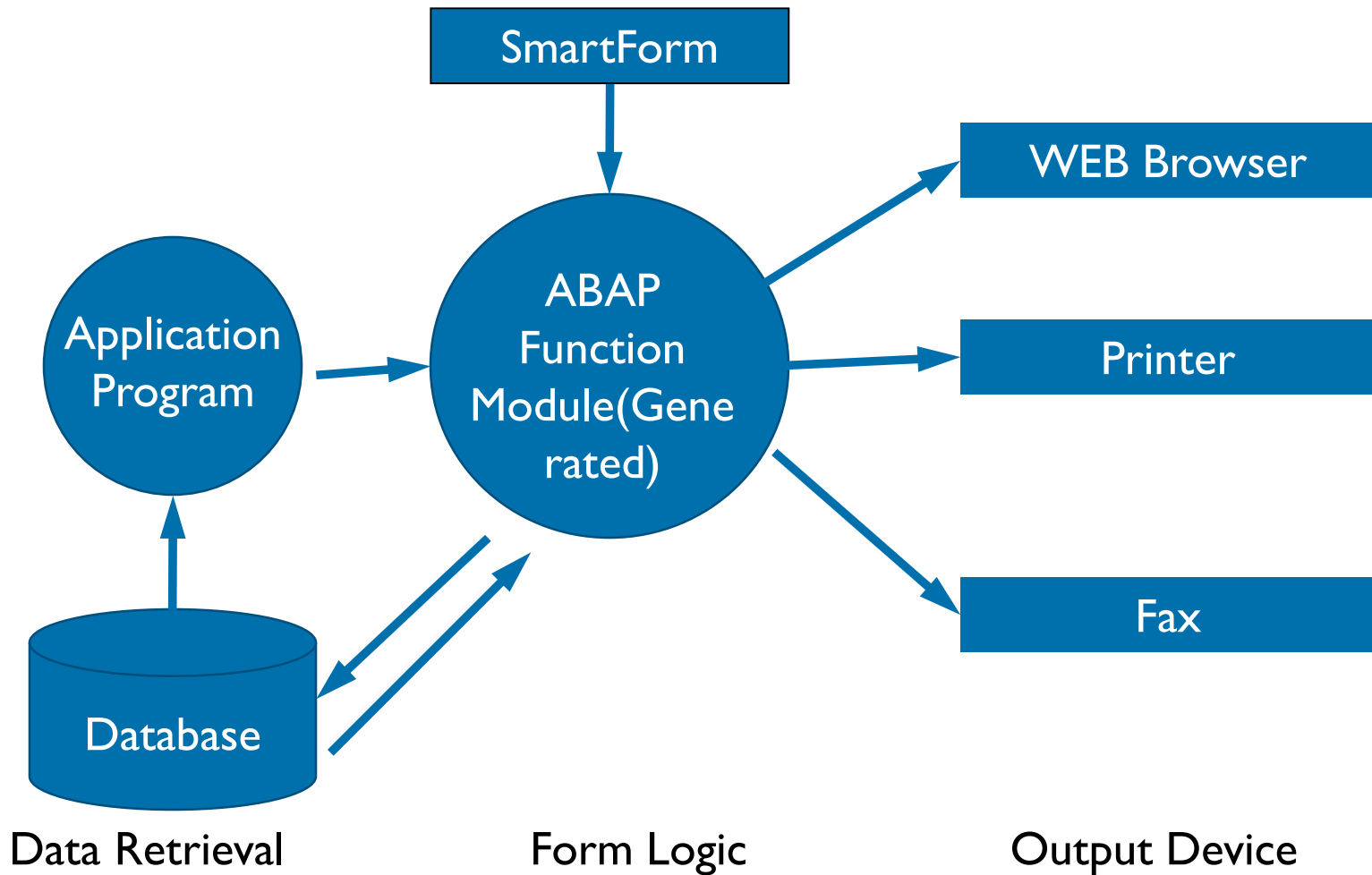
Colored output of texts

User-friendly and integrated Form Painter for the graphical design of forms.

Graphical Table Painter for drawing tables



SMARTFORM Architecture





A Smart form has the following attributes:

- 1.Layout: A layout. In the layout, you define how the output data is positioned, its appearance in graphics, and the design of the pages.
- 2.Form logic : control the flow of the form output.
- 3.Form interface to transfer application data to the form definition.

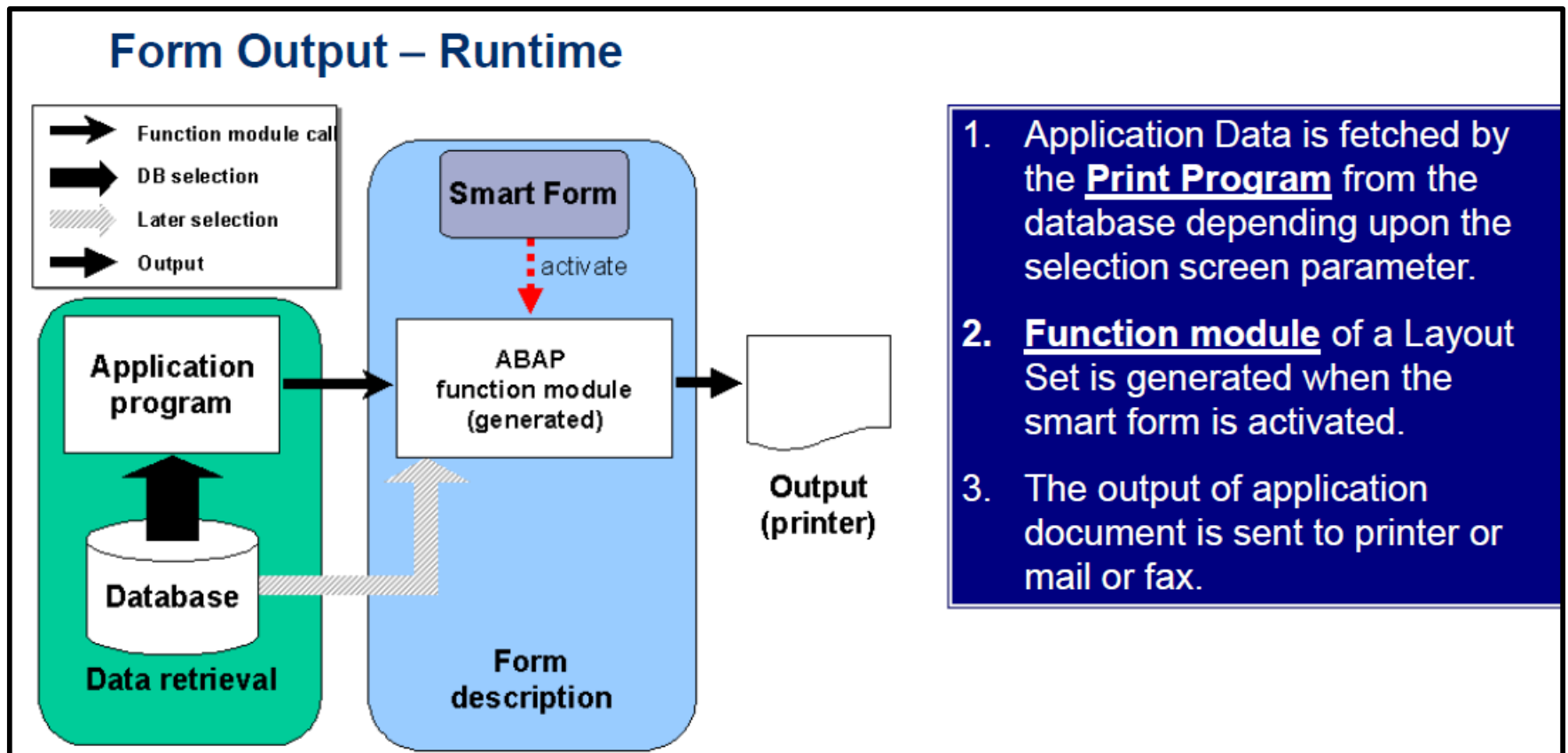
Transactions

SMARTFORMS	Create Smartform
SMARTSTYLES	Create style
SO10	Create standard Text
SE38	Create print program
SE78	Upload Logo



Architecture - Form Output Runtime

The following graphics show you the architecture that is implemented when you create and print a Smart form.





Transaction Codes in Smart Forms

Different Transaction codes used while working with Smartforms are

Transaction Code	Description
Smartforms	To Create forms
SE78	To create any graphic image which in turn can be used as logo or background picture in Smart forms



Structure of SmartForm

SMARTFORMS provides a graphical user interface which is divided into three different parts:

- Navigation Panel
- PC Editor
- Form Painter

Demo: View Smartform Interface





Smart Forms - Navigation Panel

Global Settings Has 3 sections

- Form Attributes
 - Define settings necessary for printing like page format, characters per inch, flag for XSF output etc

SAP Form Builder: Change Form ZVKSMARTFORMS2

Form Painter

Form: ZVKSMARTFORMS2 Inactive

Description: New Form

General Attributes | Output Options

Page Format: DINA4

Characters per Inch: 10.00

Lines per Inch: 6.00

Style: SYSTEM

Output

Output Format: Standard Output

Output Mode:

Output Device:



Navigation Panel - Global Settings

Form Interface

- To transfer application data to form definition
- The IMPORT EXPORT parameters and INTERNAL TABLES are declared
- Exception handling is also taken care.

Form: ZVKSMARTFORMS2 Inactive
Description: New Form

Import Export Tables Exceptions

Parameter Name	Type Assignment	Associated Type	Default Value
ARCHIVE_INDEX	TYPE	TOA_DARA	
ARCHIVE_INDEX_TAB	TYPE	TSFDARA	
ARCHIVE_PARAMETERS	TYPE	ARC_PARAMS	
CONTROL_PARAMETERS	TYPE	SSFCTRLP	
MAIL_APPL_OBJ	TYPE	SWTOBJID	
MAIL_RECIPIENT	TYPE	SWTOBJID	
MAIL_SENDER	TYPE	SWTOBJID	
OUTPUT_OPTIONS	TYPE	SSFCOMPOP	
USER_SETTINGS	TYPE	TDBOOL	'X'
P_MATNR1	TYPE	MATNR	'CAP_MAT1'
P_MATNR2	TYPE	MATNR	'CAP_MAT92'



Navigation Panel - Global Settings (Contd.).

Global Definition

- Allows user to declare variables which can be used on global scope

Form: ZVKSMARTFORMS2 Inactive
Description: New Form

Global Data | Types | Field Symbols | Initialization | Form Round

Variable Name	Typing	Associated Type
IT_TAB	TYPE STANDARD ...	MARA
WA_TAB	TYPE	MARA

Specify the Data
Objects used in Form



Pages and Windows

Provides list of all components of form

All the basic elements are maintained under this node

- Pages
- Windows
- Graphic
- Address



Pages

Each form consists of one or more pages

The first page in the tree structure is the start page

The page layout includes the page format and the position of windows on a page



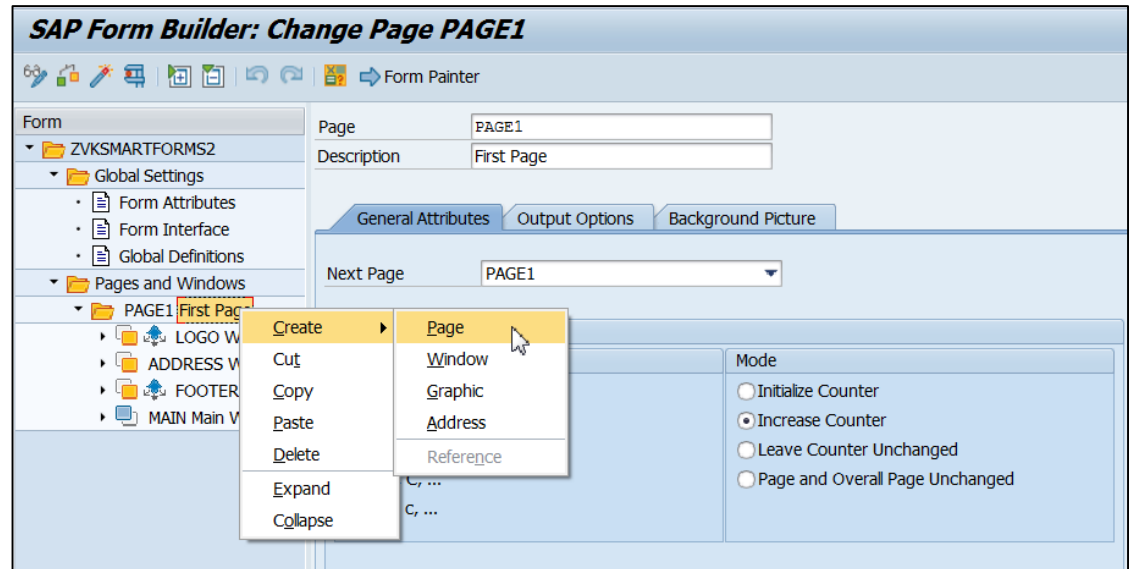
Procedure for Creating Page

Select an existing page node to position the new page node

Create a new page node in the navigation tree of the Form Builder

Name and description has to be specified

The format and mode of the page counter has to be specified on General Attributes tab





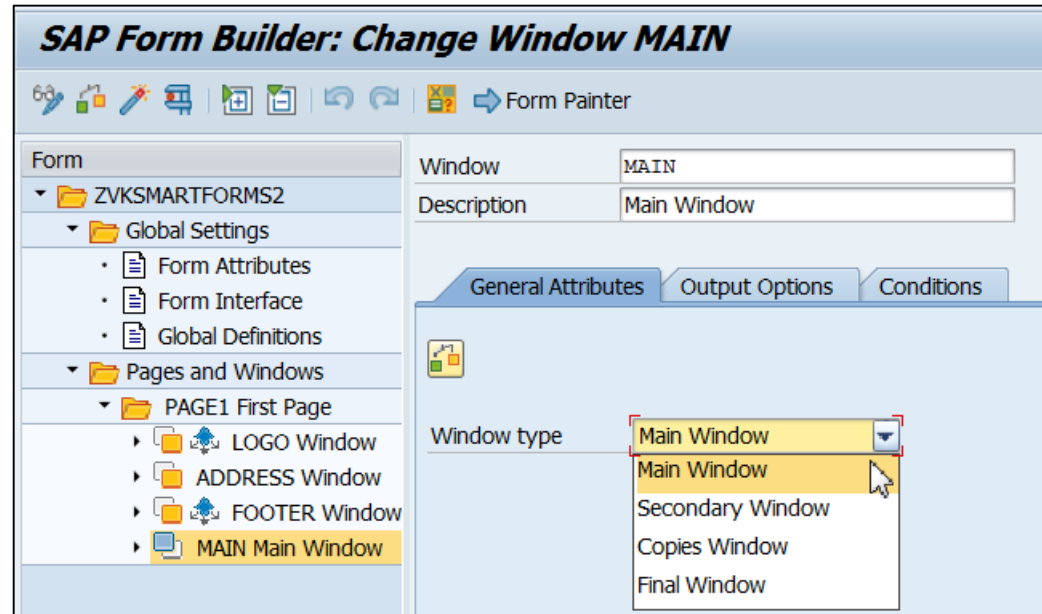
Windows

Output areas for all output data

Size and position are set in the Form Painter

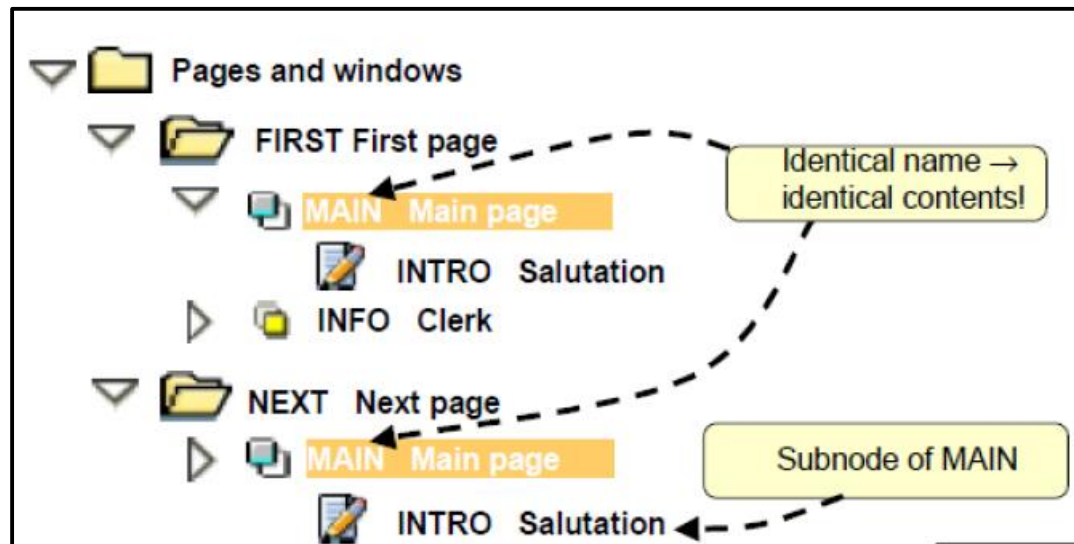
Following are the Window Types in Smartforms

- Main window
- Secondary window
- Copies Window
- Final Window





Form Builder - Structuring Pages





Main Window

Display the text and data that runs in to several pages

It automatically triggers the page break

Only one window in a form is main window

The main window must have the same width on each page

A page without main window must not call itself as next page, since this would trigger an endless loop



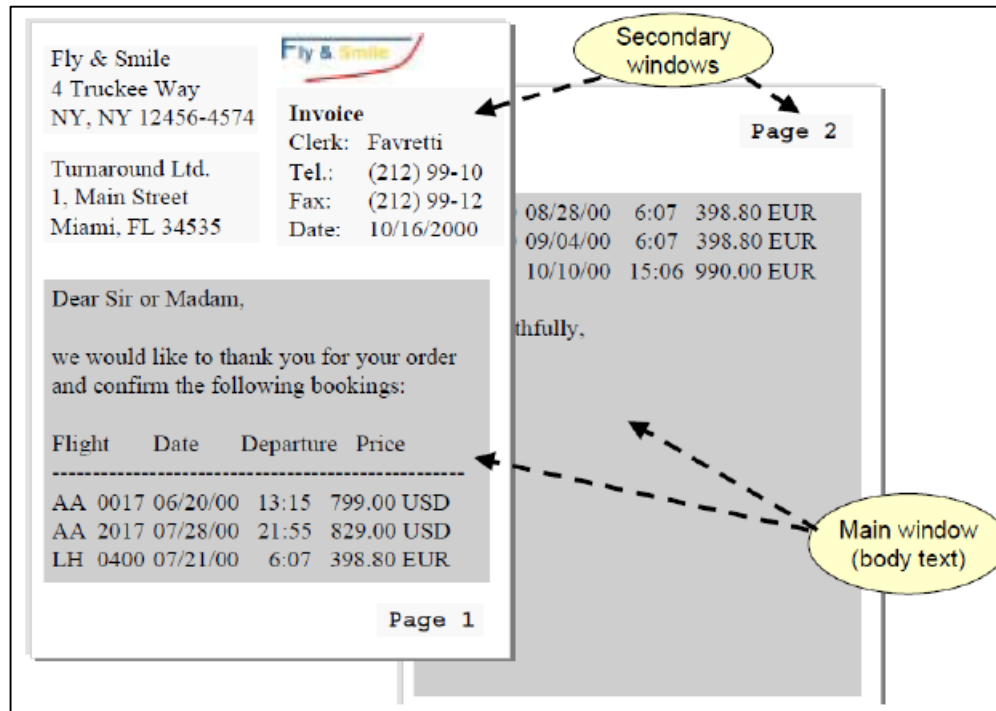
Secondary-Windows

Text and data displayed in a predetermined output area.

Text and data that do not fit into the secondary window are truncated and not displayed.



Form Builder - Main and Secondary Windows



Copies-Window



The content will appear either in the copy form or original form

This is used for printing the copies of the form



Final window is used to display values which are processed in the initial pages



Texts and Data in a Form:

Texts and data are entered using PC Editor

Various Operations performed in the PC Editor

Tables or templates can be used to display texts and data in table format



Positioning of Texts on the Form

All the texts in the form are displayed using text nodes

The only exception is addresses, which are displayed using their own node



Entering Texts in PC Editor

New texts are entered in PC Editor

The system fields and the user-defined fields are used to include data from form interface

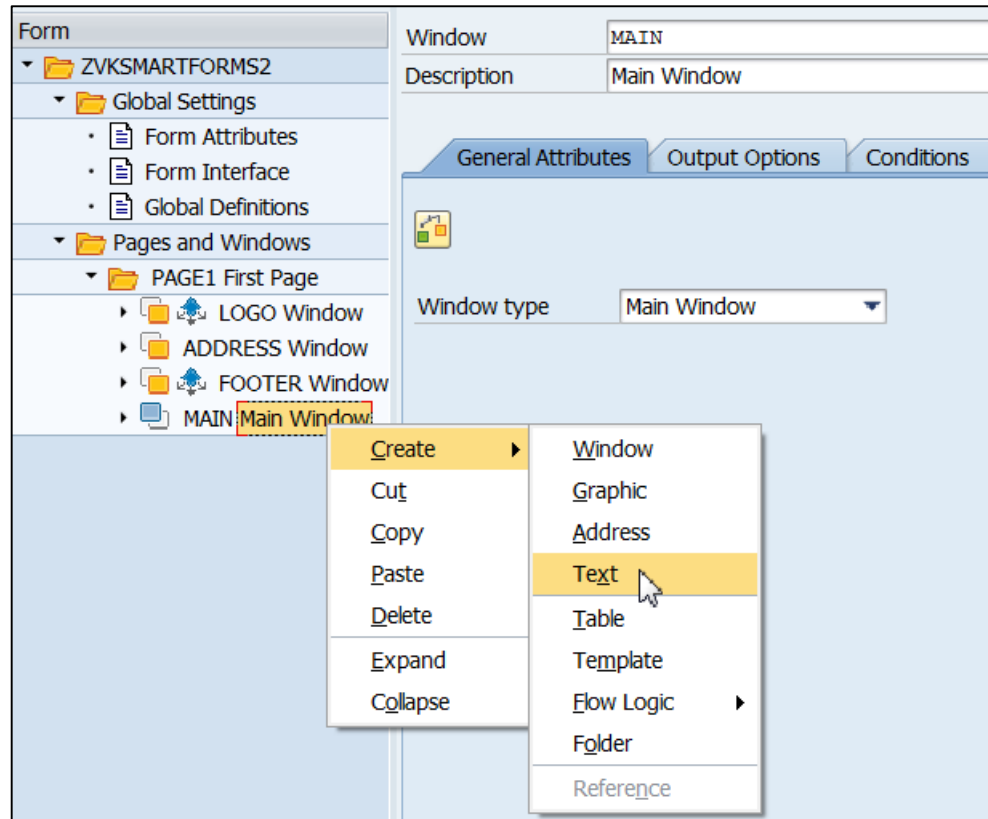
These fields are replaced with values when the form is processed



Creating Text

Procedure

- 1. Create a text node in the navigation tree of the Form Builder.





Text Element in Form

Enter a unique name for the node and a node description.
On the General Attributes tab choose Text Element as text.

The screenshot displays the SAP Form Builder interface. The title bar reads "SAP Form Builder: Change Text %TEXT1". The left sidebar shows a tree structure under "Form" with folders "ZVKSMARTFORMS2", "Global Settings", "Pages and Windows", and "PAGE1 First Page". Under "PAGE1 First Page", there are sub-items: "LOGO Window", "ADDRESS Window", "FOOTER Window", "%TEXT1 New Text" (highlighted), and "MAIN Main Window". The main workspace is divided into two sections. The top section has fields for "Text" (containing "%TEXT1") and "Description" (containing "New Text 1"). Below this are four tabs: "General Attributes", "Web Properties", "Output Options", and "Conditions". The "General Attributes" tab is active, showing "Text Type" set to "Text Element" and "Start" set to "New Paragraph". Below the tabs is a toolbar with icons for various actions. The bottom section shows the "Paragraph Format" set to "Paragraph Left-aligned" and "Character Format" set to a default. The text content area displays "Date:&SFSY-DATE& Time:&SFSY-TIME& PageNo:&SFSY-PAGE&".

Demo: Create a smartform without table





Integrating the Smart Form into the Application

Form printing triggered by calling function modules

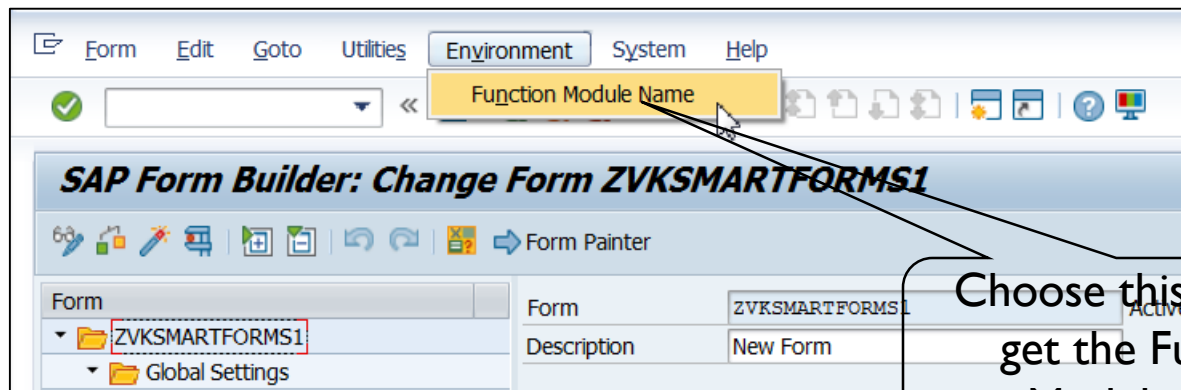
Name of the form determines the name of the generated function module.

The name of the generated function module is unique only within one system.

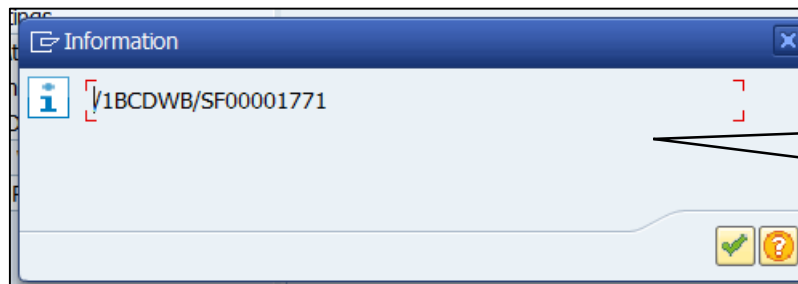


Procedure

In the Form Builder call the function Environment ☐ Name of the function module and copy its name.



Choose this menu to get the Function Module name



The smart form function module name



Procedure (Contd.).

In the application program define a variable of type RS38L_FNAM for the name of the generated function module:

- Data fm_name type RS38L_FNAM.

The Smart Form can be called in other parts of the application program as well.

Function module SSF_FIELD_LIST - to list form parameters

Function module SSF_FUNCTION_MODULE_NAME - returns the name of generated function module



a) Data retrieval

b) Name of generated function module?

c) Call of function module

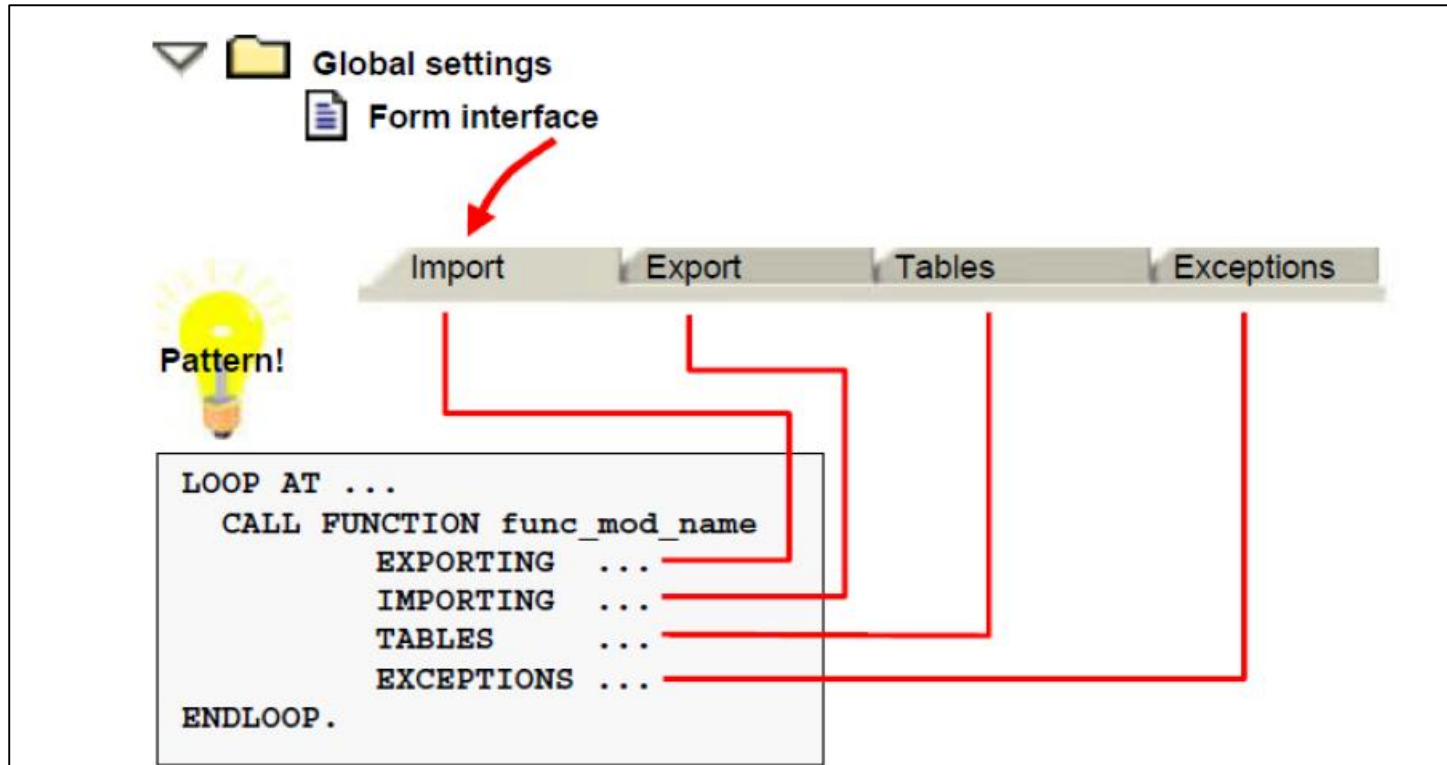
```
PROGRAM ...
DATA:
  ssf_name      TYPE tdsfname,
  func_mod_name TYPE rs38L_fnam.

SELECT ... FROM ...
...

CALL FUNCTION 'SSF_FUNCTION_MODULE_NAME'
  EXPORTING
    formname = ssf_name
  IMPORTING
    fm_name  = func_mod_name.

LOOP AT |...
  CALL FUNCTION func_mod_name
    EXPORTING ...
    IMPORTING ...
ENDLOOP.
```

Integration into Application Programs – Generated Function Module



Integration into Application Programs – Control Structure **CONTROL_PARAMETERS**



CONTROL_PARAMETERS

(Export parameters of the function module generated)

Type: `ssfctrlop`

<code>no_open</code>	No new spool request
<code>no_close</code>	Do not close spool request
<code>device</code>	Output device ('PRINTER', 'TELEFAX', 'MAIL')
<code>no_dialog</code>	No dialog box for output
<code>preview</code>	Print preview
<code>langu</code>	Language
<code>startpage</code>	Start page ≠ default

Demo: Integrate smartform in application





Text Modules

Text modules are used to centrally store texts that are used frequently in forms in the system.

Text modules are included in forms using texts nodes

Allows easy use of text from a text module in several forms

It Can be used across clients



Creating Text Module (Contd.).

SAP Smart Forms: Initial Screen

Form ☐ Style ☐ **Text Module ☒**

Display Change Create

Text module name

Text Module Edit Goto Utilities System Help

Change Text Module **ZVKTEXTMOD1**

Text Module
Description

Management

Paragraph Format * Paragraph Left-aligned Character Format

This text is available in all forms



Include Text Module in Form

- 1. Create a text node in the navigation tree
- 2. In General attributes tab change the type as 'TEXT MODULE'
- 3. Change text name to the name of the text module

The screenshot displays the Capgemini Form Designer interface. On the left, the 'Form' navigation tree shows a project named 'ZVKSMARTFORMS2_TABLE' with sub-items like 'Global Settings', 'Form Attributes', 'Form Interface', 'Global Definitions', 'Pages and Windows', and 'PAGE1 First Page'. Under 'PAGE1 First Page', there is a folder 'PAGE1 First Page' containing several nodes: '%GRAPHIC1 New Graphic', 'LOGO Window', 'ADDRESS Window', 'FOOTER Window', '%TEXT1 New Text' (highlighted), and 'MAIN Main Window'. The main workspace shows the 'General Attributes' tab for the selected '%TEXT1 New Text' node. The 'Text' field is set to '%TEXT1' and the 'Description' is 'New Text 1'. The 'Text Type' dropdown is set to 'Text Module', and a mouse cursor is pointing at the 'Text Module' option in the dropdown menu. Other options in the dropdown include 'Text Element', 'Include Text', and 'Dynamic Text'. The 'Name' field is empty, and the 'Language' is set to 'Include Text'. The 'Start' dropdown is set to 'New Paragraph'. There is a 'Copy' button and a checkbox for 'Always copy style from text module'. At the bottom, there are tabs for 'Paragraph Format' (set to 'Paragraph Left-aligned') and 'Character Format'. The text area contains the placeholder text 'This text is available in all forms'.

Choose to insert
the text created

Demo: Create and include text module in a form



Inserting Addresses:



Administered using the Business Address Services (BAS)

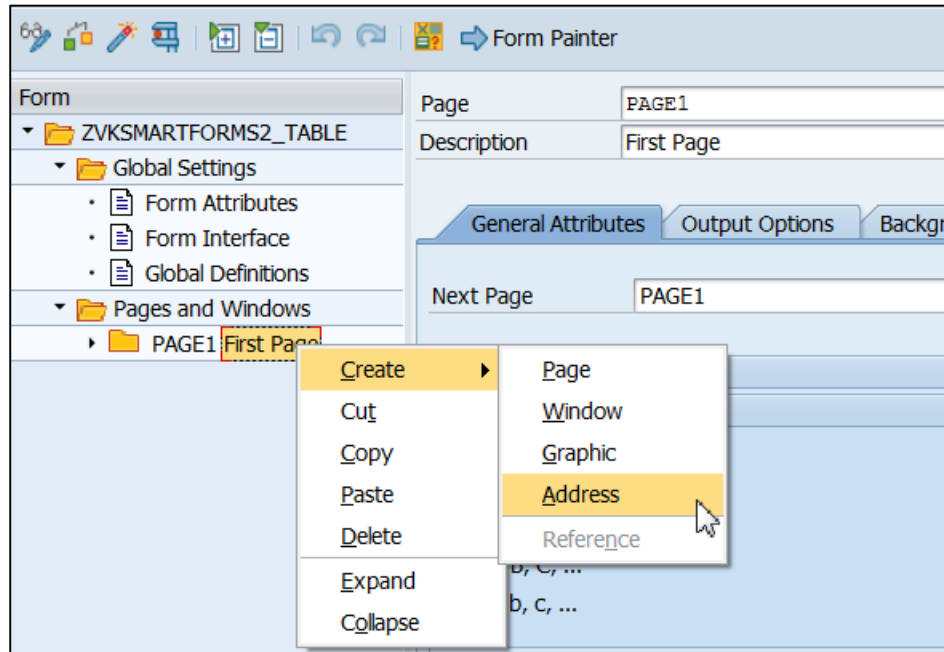
According to the postal regulations of the sender country, the address is formatted

Three address types

- Company addresses(address type 1)
- Personal addresses(address type 2)
- Workplace addresses(address type 3)



Creating Address-type





Address:


Form


- ▼ ZVKSMARTFORMS2
 - ▼ Global Settings
 - Form Attributes
 - Form Interface
 - Global Definitions
 - ▼ Pages and Windows
 - ▼ PAGE1 First Page
 - LOGO Window
 - ADDRESS Window
 - %TEXT2 New Text
 - %CODE2 New Program
 - %ADDRESS1 New Address
 - FOOTER Window
 - MAIN Main Window


Address ADDRESS

Description New Address 1

General Attributes Output Options Conditions

Type ☒ Organization Address (1) 
☐ Personal Address (2)
☐ Workplace Address (3)
☐ Determine Dynamically (1,2,3)

Address Number 256 

Person Number 

Additional Address Specifications



Graphics In Smartforms

To import, administer and transport images or graphics

They can be incorporated statically into a form or include them dynamically using an appropriate field

Images can be included in background as well

Demo: Create Address





Graphics

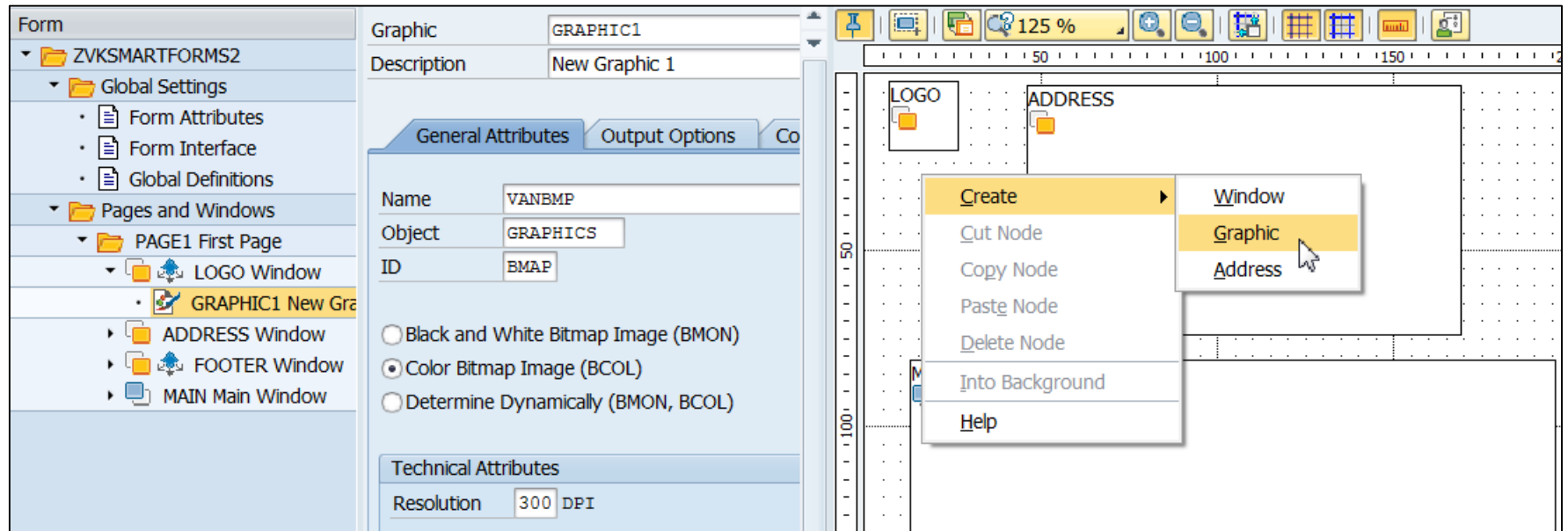
*.BMP and *.TIF files can be imported and used in forms.

SE78 - Graphic administration.

The screenshot displays the 'Form Painter' application window. On the left is a tree view under the 'Form' node, showing a hierarchy: 'ZVKSMARTFORMS2' > 'Global Settings' > 'Form Attributes', 'Form Interface', and 'Global Definitions'. Under 'Pages and Windows', there is a 'PAGE1 First Page' node, which contains a 'LOGO Window' node. The 'LOGO Window' node is expanded, showing a sub-item 'GRAPHIC1 New Gra' which is highlighted with a red box. Other items under 'PAGE1 First Page' include 'ADDRESS Window', 'FOOTER Window', and 'MAIN Main Window'. The right pane shows the properties for the selected 'GRAPHIC1' object. It has a 'Graphic' field with the value 'GRAPHIC1' and a 'Description' field with the value 'New Graphic 1'. Below these are three tabs: 'General Attributes', 'Output Options', and 'Conditions'. The 'General Attributes' tab is active, showing fields for 'Name' (VANBMP), 'Object' (GRAPHICS), and 'ID' (BMAP). There are three radio button options: 'Black and White Bitmap Image (BMON)', 'Color Bitmap Image (BCOL)' (which is selected), and 'Determine Dynamically (BMON, BCOL)'. At the bottom, there is a 'Technical Attributes' section with a 'Resolution' field set to '300 DPI'.



Creating Graphics in Smart Forms



Create window to
add Images

Demo: Create Graphics in Smartforms





Working with Tables

To display or print contents in tabular form

Node types

- Template node
 - Static - The number of columns and lines are determined before the actual output
- Table node
 - Dynamic - Table size depends on the amount of data selected at runtime

Line Types Specifies

- Width of table line
- The layout of both node types
- Also the width of the individual cells within the table line



The table can be designed independent of the number of lines

The size of the table depends on how much data the application program passes to the form at runtime

Tables cannot be nested.

Output of a table can be divided into

- header
- main area
- footer



Accessing Application Data

The application program reads the data to be displayed on the form as a table from the database and writes it into an internal table

When calling the Smart Form, this internal table is passed to the form interface to access it within the form description

Access the internal table to display it on the form line by line

To accessing several internal table for table output whose entries are interdependent combine loop and table nodes

Reading Internal-Tables



The table is printed in the form line by line as the number of selected entries in the internal table differs

The table node defines a table layout

The Data tab is used to access internal tables, which exists for loop nodes and for table nodes



Procedure to read Internal Tables

Create a work area for the internal table in the global definitions

Go to Data tab of the loop or table node and mark Internal Table else the loop is deactivated

Enter the name of the internal table that is passed at the form interface

Enter the assignment type (INTO or ASSIGNING) and a work area (structure with the same type as the table line or the field symbol)

- If a table with header line is used as work area specify the internal table name again
- If desired, use the input fields Line and To to limit the lines of the internal table that is to be read

Use the group box WHERE Condition to select a particular part of the data in the internal table

Procedure



Form Painter

Form

- ▼ ZVKSMARTFORMS2_TABLE
 - ▼ Global Settings
 - Form Attributes
 - Form Interface
 - Global Definitions
 - ▼ Pages and Windows
 - ▼ PAGE1 First Page
 - %GRAPHIC1 New Graphic
 - LOGO Window
 - ADDRESS Window
 - FOOTER Window
 - ▼ MAIN Main Window
 - %CODE1 New Program
 - ▼ TABLE1 Table
 - Header
 - Main Area
 - Footer

Table: TABLE1
Description: Table

Table | Data | Calculations | Output Options | Conditions

LOOP Loop

☒ Internal Table IT_TAB INTO WA_TAB

Row to

WHERE Condition

Fld Name	O..	Comparison Value

Specify the Data source for tables



Table Calculations - Procedure

SAP Form Builder: Change Table TABLE1

Form Painter

Table: TABLE1
Meaning: New Table 1

Table | Data | Calculations | Output Options | Conditions


Operation	Field Name	Target Field Name	Time	For Field Name	Initi...	Reset	For Field Name
Total1					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		
					<input type="checkbox"/>		




Demo: Create table in smartform





- 1. You use the Template node type to output tables with a fixed layout and size.
- 2. Templates cannot be nested

▼  **TICKET** Flight ticket

-  **C_NAME** Name
-  **C_DATE** Date
-  **C_ARR1** 1. Destination
- ...

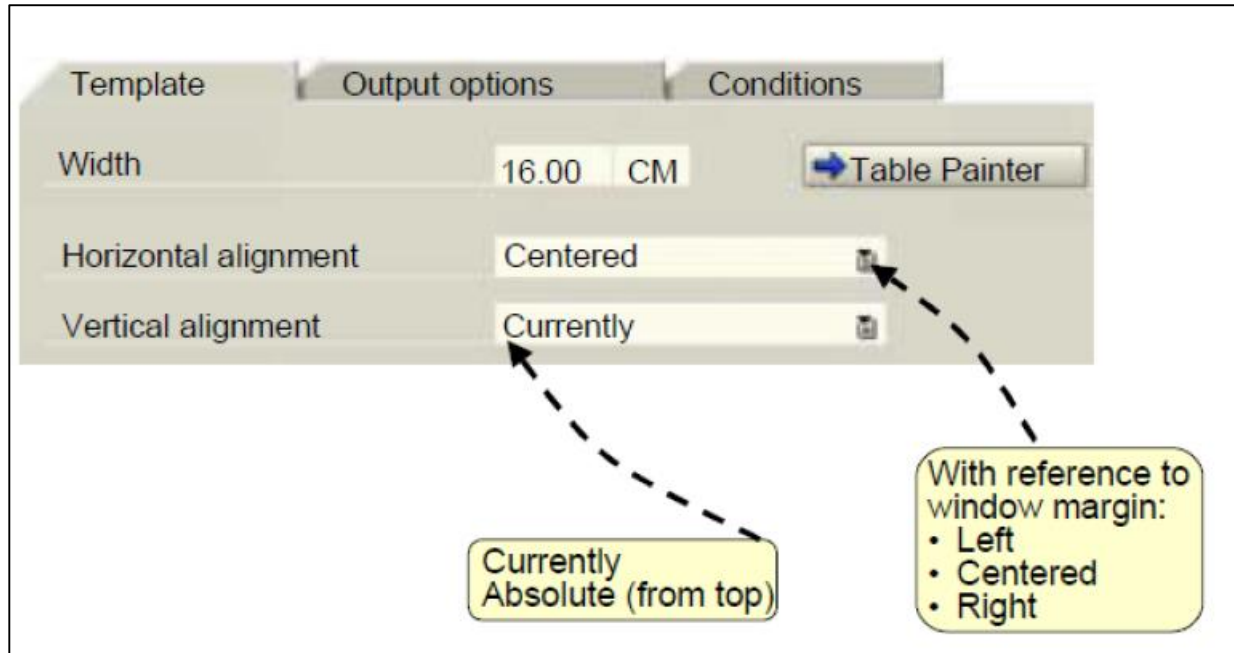
Red arrow points from the TICKET node to the rendered table below.

Name of passenger (not transferrable) MAYER/A MR				Date of issue 16NOV00		
To	Carr.	Flight	Class	Date	Time	Status
FRANKFURT	LH	2362	L	27NOV	1840	OK
BERLIN TXL	LH	2351	L	28NOV	1910	OK
Flight price DEM 350.00		Form and serial number 3344563125667				
Tax DEM 52.59						
Total DEM 402.59		Please do not write on or stamp this field.				

Dashed arrow points from the table to the callout box.

- Layout fixed
- Width and height fixed
- Different line types

Template Layout



Template Layout

















































Template Output options Conditions

Width 16.00 CM [Table Painter](#)

Horizontal alignment Centered

Vertical alignment Currently

Template Layout



Name	Frm	To	Reference	Height	U.	1.	U.	2.	U.	3.	U.
TOP	1	1		1.50	CM	8.00	CM	8.00	CM		
FLIGHTS	2	4		1.00	CM	3.00	CM	1.00	CM	12.00	CM
BOTTOM	5	6	TOP	1.50	CM	8.00	CM	8.00	CM		



1. TOP

2. FLIGHTS

3. FLIGHTS

4. FLIGHTS

5. BOTTOM

6. BOTTOM

1.			2.		
1.	2.	3.			
1.	2.	3.			
1.	2.	3.			
1.			2.		
1.			2.		

Template Layout



TICKET Flight ticket

C_NAME Name

C_DATE Date

C_ARR1 1. Destination

1.

1.

2.

2.

1.

2.

3.

3.

1.

2.

3.

4.

1.

2.

Template

Output options

Conditions

Style

Output structure

Line

2

Column

3

Demo: Create template in smartform





Dynamic Page-Break

Page break triggered when the main window of a page is full

Only the contents of main window can spread over several pages



Page-Numbering

&SFSY-PAGE&

- Specifies current page number

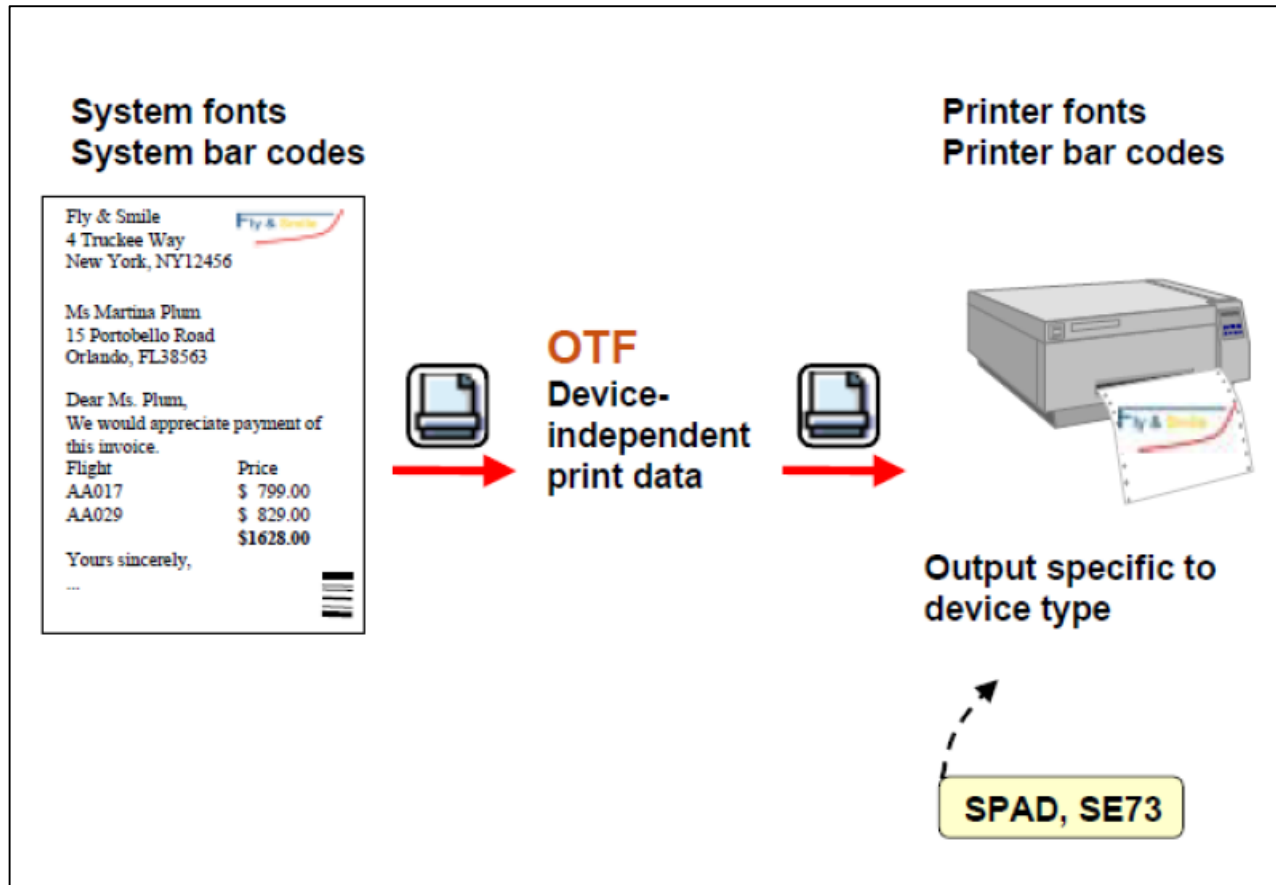
&SFSY-FORMPAGES&

- Specifies total number of pages in the form

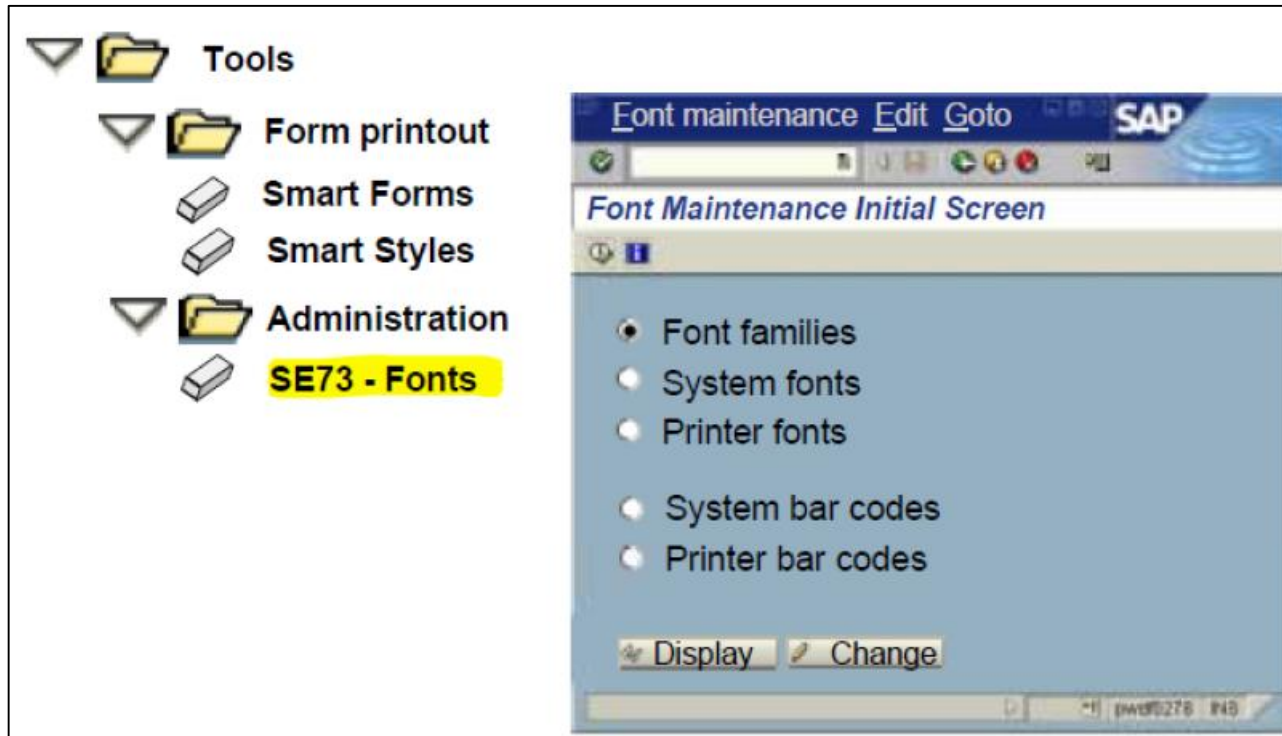
&SFSY-JOBPAGE&

- Specifies total number of pages in all forms in the print job

Font and Bar Code Maintenance



Accessing Font Maintenance



Maintaining and Using Bar Codes



Font maintenance Edit Goto

Font Maintenance Initial Screen

...

☒ System bar codes
☐ Printer bar codes

Display Change

SE73

SMARTSTYLES

Char. Format B1
Description Bar code EAN13

Standard settings Font

...

Bar code

Name EAN13
Width 5.00 CM
Height 5.00 CM



- 0008928 List of supported printers/device types
- 0005196 Printing bar codes with SAPscript
- 0017054 How to copy or change a device type
- 0012462 How can I define a new printer font?
- 0317851 Printing PDF files in 4.6C/4.6B/4.5B/4.0B
- 0201307 TrueType fonts for Smart Forms/SAPscript



In this lesson, you have learnt:

- The Smartforms Architecture
- SAP Form Builder
- Texts, Addresses and Graphics
- Tables and Templates
- Flow Control
- How to Integrate SmartForms into Application Programs
- Fonts and Bar Codes



Review Question



Question 1. _____ is used to transfer application data to the form definition.

Question 2: Text modules are included in forms using _____.

