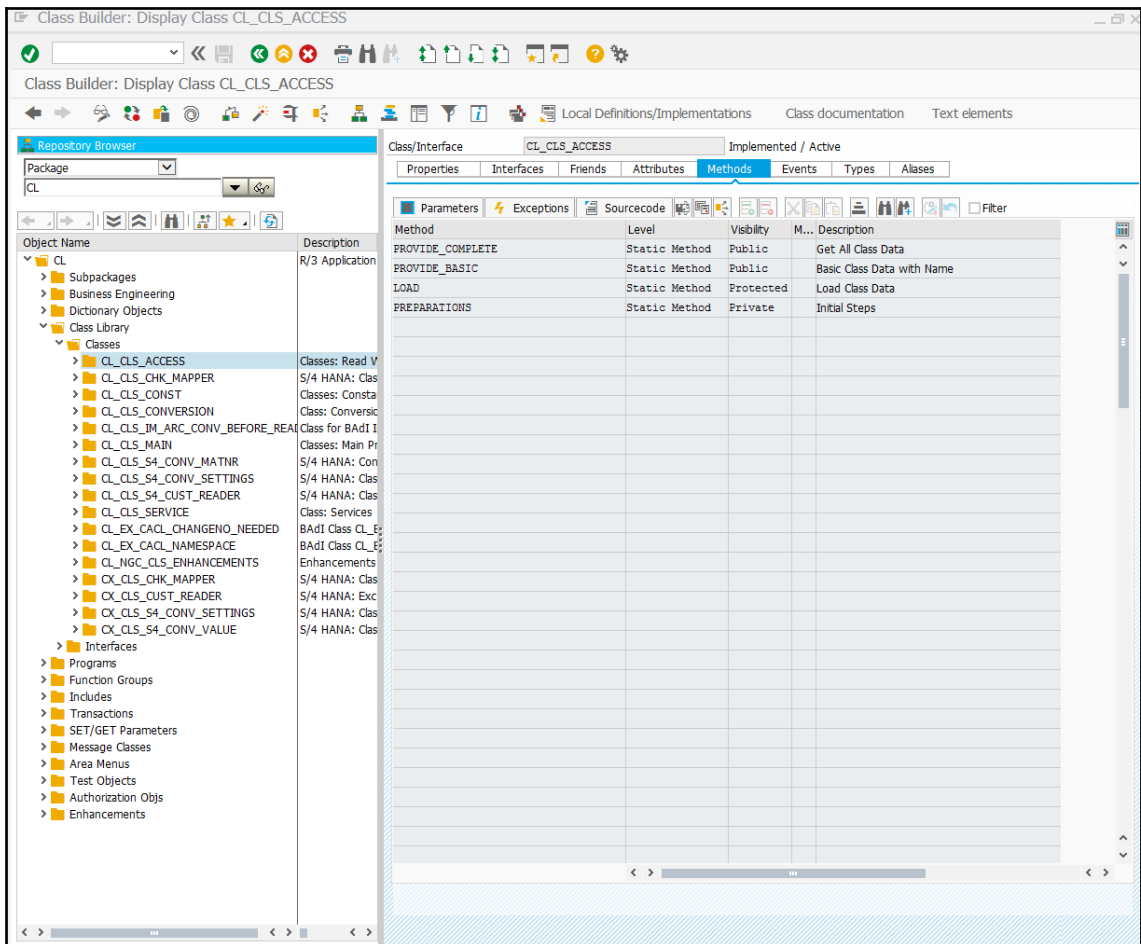
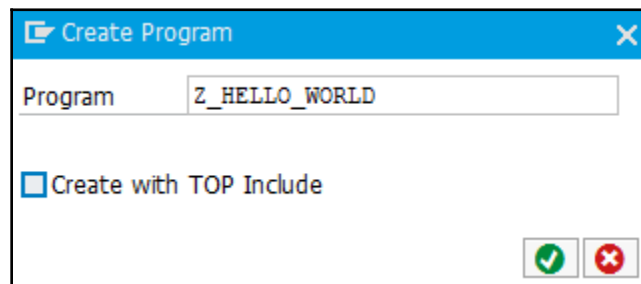
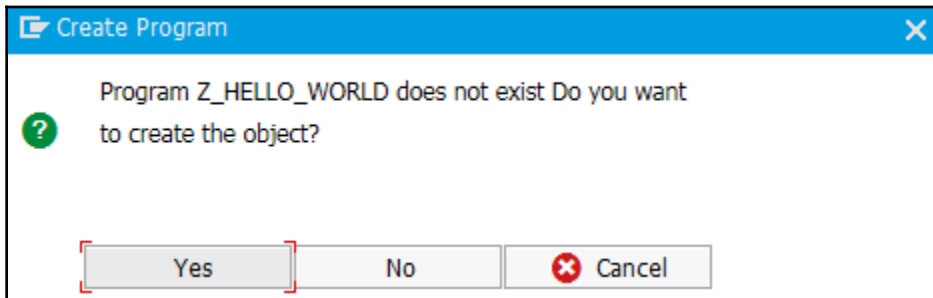
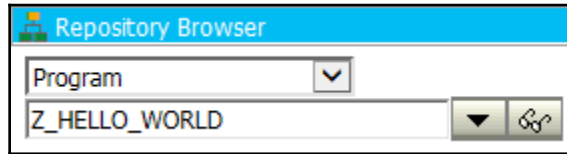
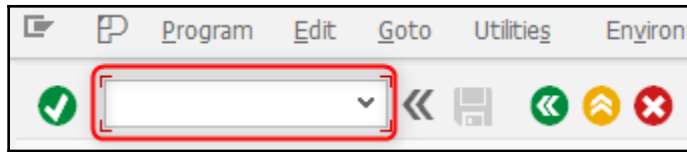


# Graphic Bundle

## Chapter 1: Creating Custom Code



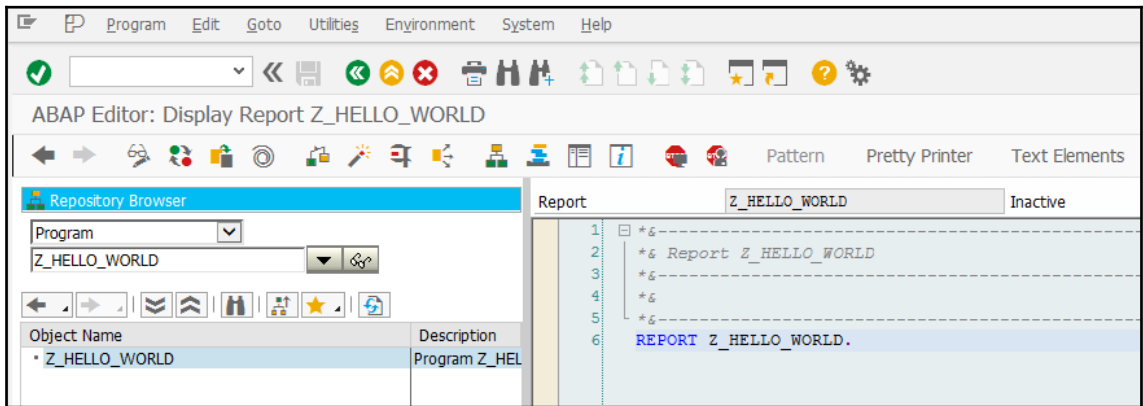
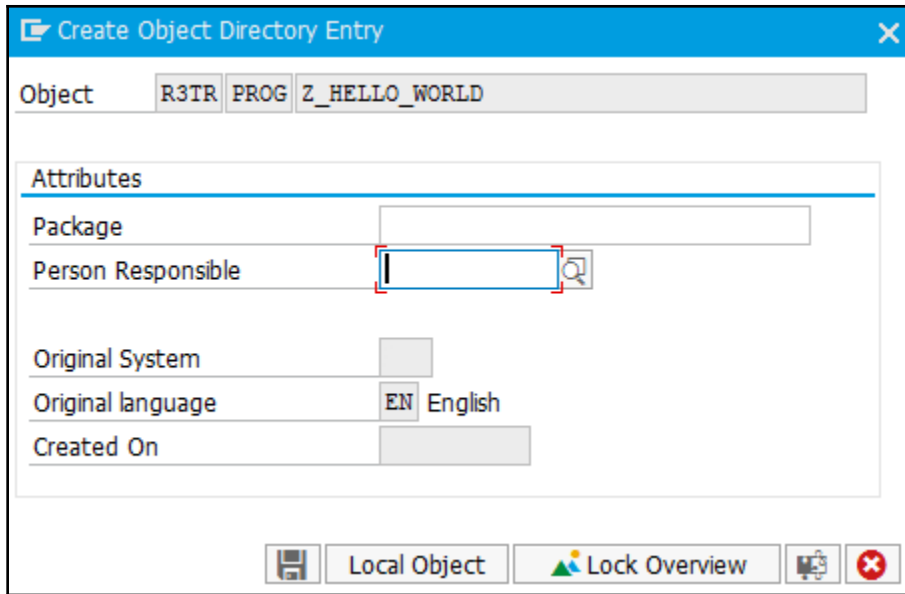


ABAP: Program Attributes Z\_HELLO\_WORLD Change

Title	Program Z_HELLO_WORLD	
Original language	EN	
Created		
Last Changed		
Status	New (Revised)	
Attributes		
Type	1 Executable program	
Status	Unclassified	
Authorization Group		
Application		
LDB name		
Selection screen		
ABAP Language Version	X Standard ABAP (Unicode)	
<input checked="" type="checkbox"/> Fixed point arithmetic		
<input type="checkbox"/> Editor lock		
<input type="checkbox"/> Start using variant		

Save [Icons]

Local Object



```
Report      Z_HELLO_WORLD      Inactive
1  *&-----*
2  *& Report Z_HELLO_WORLD
3  *&-----*
4  *&
5  *&-----*
6  REPORT Z_HELLO_WORLD.
7  ▶
8  WRITE 'Hello World'. |
```



✔ Object activated



☰ P List Edit Goto System Help

✔ [ ] << [ ] ⏪ ⏩ ⏹ 🖨️ 🏠 🏠+ 📄 📄 📄 📄

Program Z\_HELLO\_WORLD


---

Program Z\_HELLO\_WORLD

---

Hello World










Dictionary: Display Table

← → 🔍 🔄 🏠 🗑️ 🛠️ 📊 📄 📖 📑  Technical Settings Indexes... Append Structure...

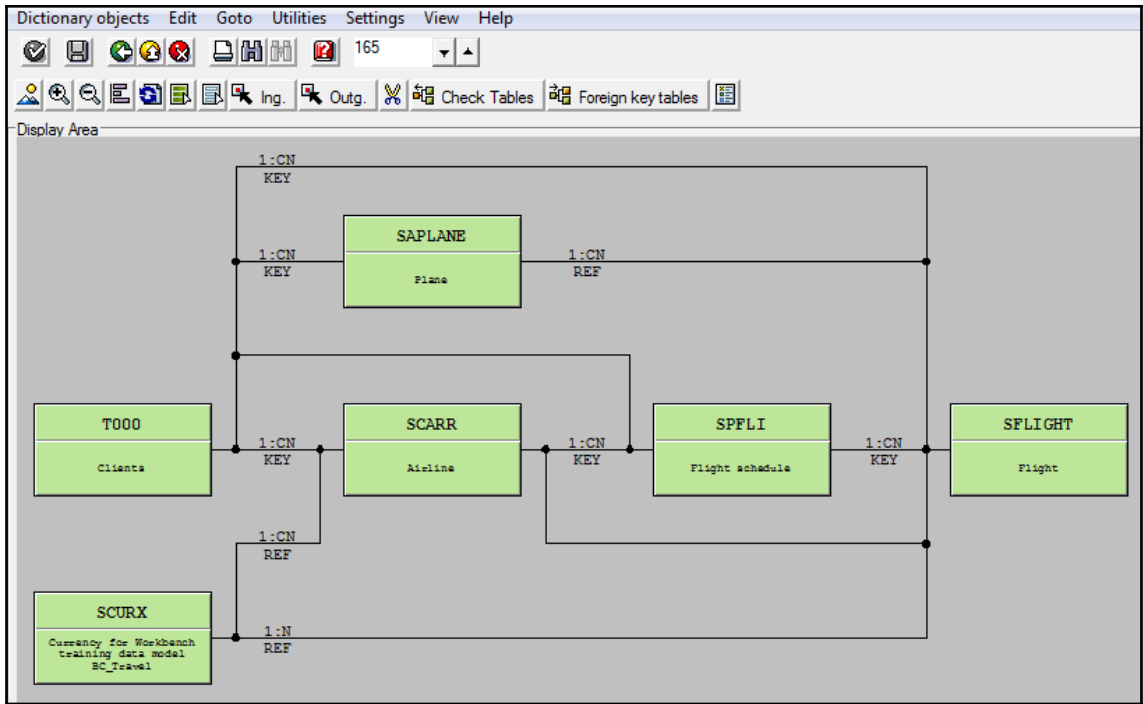
Transparent Table  Active

Short Description

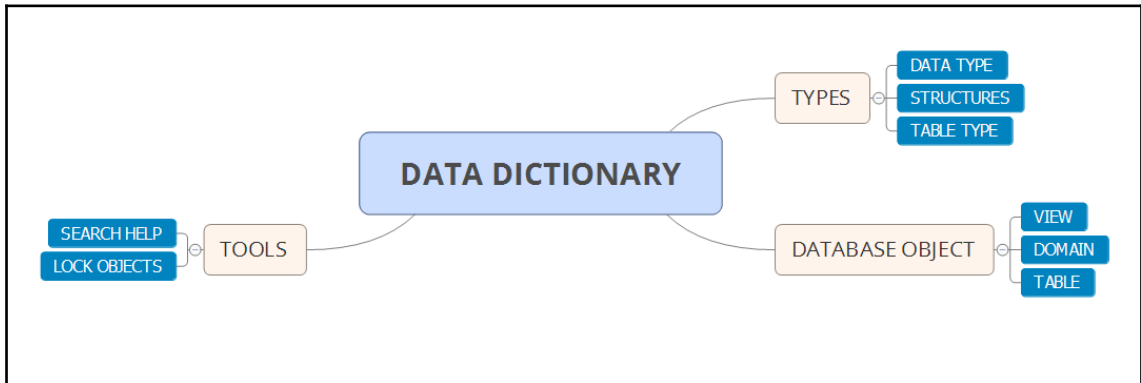
Attributes Delivery and Maintenance **Fields** Entry help/check Currency/Quantity Fields

         Srch Help  14

Field	Key	Ini...	Data element	Data Type	Length	Deci...	Short Description
<u>MANDI</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S_MANDI	CLNT	3		0 Client
<u>CARRID</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S_CARR_ID	CHAR	3		0 Airline Code
<u>CONNID</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S_CONN_ID	NUMC	4		0 Flight Connection Number
<u>FLDATE</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S_DATE	DATS	8		0 Flight date
<u>PRICE</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_PRICE	CURR	15	2	2 Airfare
<u>CURRENCY</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_CURRCODE	CUKY	5		0 Local currency of airline
<u>PLANETYPE</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_PLANETYE	CHAR	10		0 Aircraft Type
<u>SEATSMAX</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SEATSMAX	INT4	10		0 Maximum capacity in economy class
<u>SEATSOCC</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SEATSOCC	INT4	10		0 Occupied seats in economy class
<u>PAYMENTSUM</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SUM	CURR	17		2 Total of current bookings
<u>SEATSMAX_B</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SMAX_B	INT4	10		0 Maximum capacity in business class
<u>SEATSOCC_B</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SOCC_B	INT4	10		0 Occupied seats in business class
<u>SEATSMAX_F</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SMAX_F	INT4	10		0 Maximum capacity in first class
<u>SEATSOCC_F</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_SOCC_F	INT4	10		0 Occupied seats in first class



## Chapter 2: The Basic Structure of ABAP



**ABAP Dictionary: Initial Screen**

🔒 ✎ ↔ 🧩 ⓘ 🗑️ 📄

Database table

View

Data type

Type Group

Domain


Search help

Lock object

🔍 Display    ✎ Change    📄 Create



**ABAP Dictionary: Initial Screen**




Database table

View




Data type

Type Group

Domain  

Search help

Lock object

 Display  Change  Create

### Dictionary: Change Domain

Domain: ZERPD\_FIRST\_DOMAIN Active  
 Short Description: First Domain

Properties | Definition | Value Range

Format

Data Type: CHAR Character String  
 No. Characters: 10  
 Decimal Places: 0

Output Characteristics

Output Length: 10  
 Convers. Routine:   
 Sign  
 Lower Case

Domain: ZERPD\_FIRST\_DOMAIN Active  
 Short Description: First Domain

Properties | Definition | Value Range

Single Vals

I	Fix.Val.	Short Descript.
	1	EXAMPLE 1
	2	EXAMPLE 2

Tables Table Contents

Table

Attributes

Insert Column  Columns ...

Row	DOMNAME [C(30)]	VALPOS [N(4)]	DDLLANGUAGE [C(1)]	DOMVALUE_L [C(10)]
1	ZERPD_FIRST_DOMAIN	0001		1
2	ZERPD_FIRST_DOMAIN	0002		2

**ABAP Dictionary: Initial Screen**

Database table

View

Data type

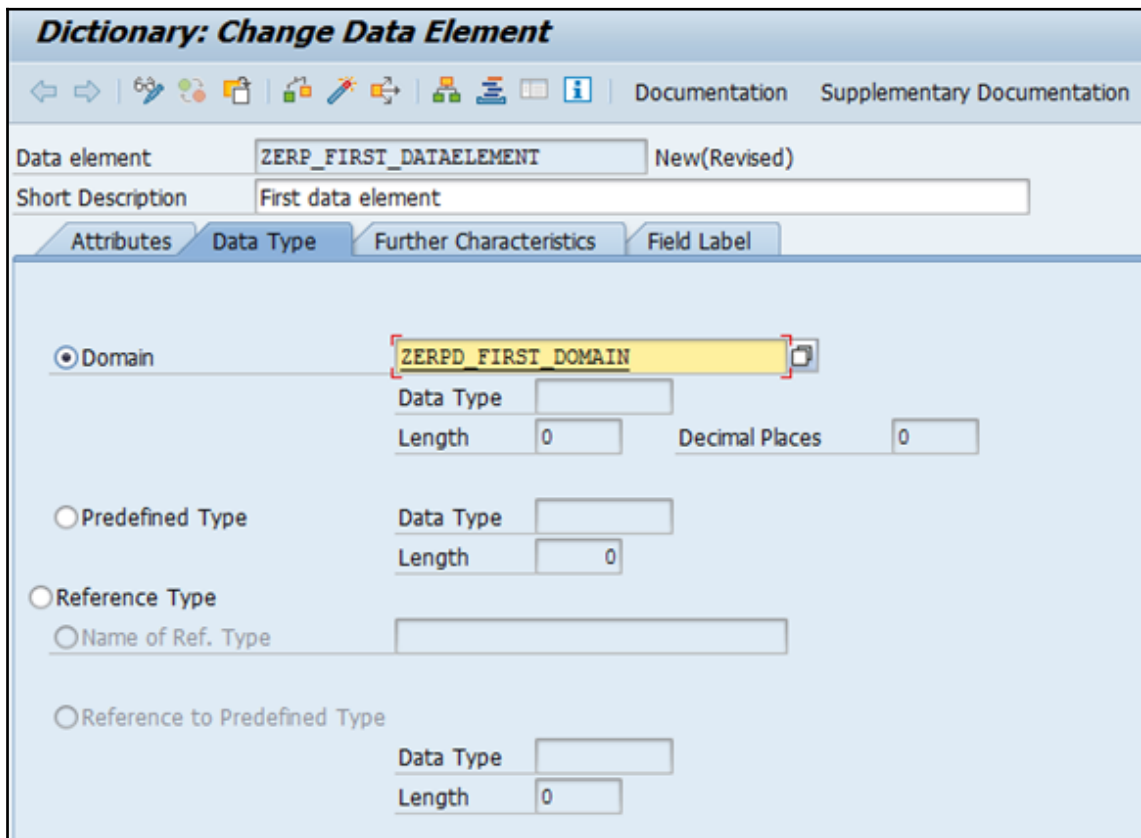
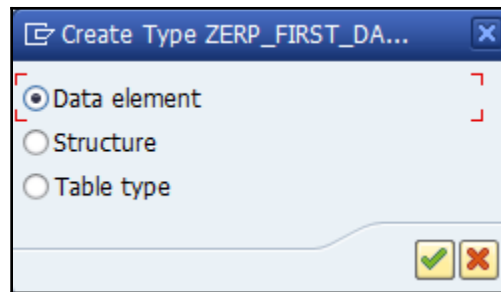
Type Group

Domain

Search help

Lock object

Display Change Create



**Dictionary: Change Data Element**

← → | | Documentation Supplementary Documentation

Data element: ZERP\_FIRST\_DATAELEMENT Active

Short Description: First data element

Attributes | Data Type | Further Characteristics | Field Label

	Length	Field Label
Short	10	First DE
Medium	20	First Data Element
Long	40	First Data Element
Heading	18	First Data Element

**Class Builder: Change Class ZCL\_FIRST\_CLASS**

← → | | Local Definitions

Class/Interface: ZCL\_FIRST\_CLASS Implemented / Inactive

Properties | Interfaces | Friends | Attributes | Methods | Events | Type

Type	Visibility	Typing	Associated...	Description
tt_type	public	pe		

ABAP Dictionary: Initial Screen

Database table 
  
 View 
  
 Data type 
  
 Type Group 
  
 Domain 
  
 Search help 
  
 Lock object

Structure  New(Revised)

Short Description

Component	Typing Method	Component Type	Data Type	Length	Deci...	Short Description
<u>CARRID</u>	1 Types	∨ <u>S_CARR_ID</u>	CHAR	3	0	Airline Code
<u>CONNID</u>	1 Types	∨ <u>S_CONN_ID</u>	NUMC	4	0	Flight Connection Number
<u>FLDATE</u>	1 Types	∨ <u>S_DATE</u>	DATS	8	0	Flight date
<u>PRICE</u>	1 Types	∨ <u>S_PRICE</u>	CURR	15	2	Airfare
<u>VALUECHAR</u>	1 Types	∨	CHAR	3	0	

Dictionary: Change Search Help

Elementary srch hlp: ZSEARCHEXAMPLE New(Revised)

Short description:

Attributes Definition

Data Collection

Selection method:

Text table:

Dialog Behavior

Dialog type: D Display values immediately

Hot key:

Enhanced Options

Proposal Search for Input Fields

Full Text Fuzzy Search (Database-Specific)

Accuracy Value for Error-Tolerant Full Text Search: 0, 8

Search help exit:

Parameter

Search help parameter	IMP	EXP	LPos	SPos	SDis	Data element	M...	Default value
	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	

Dictionary: Change Search Help

Elementary srch hlp: ZSEARCHEXAMPLE Active

Short description: Example

Attributes Definition

Data Collection

Selection method: ZTABLEDB

Text table:

Dialog Behavior

Dialog type: D Display values immediately

Hot key:

Enhanced Options

Proposal Search for Input Fields

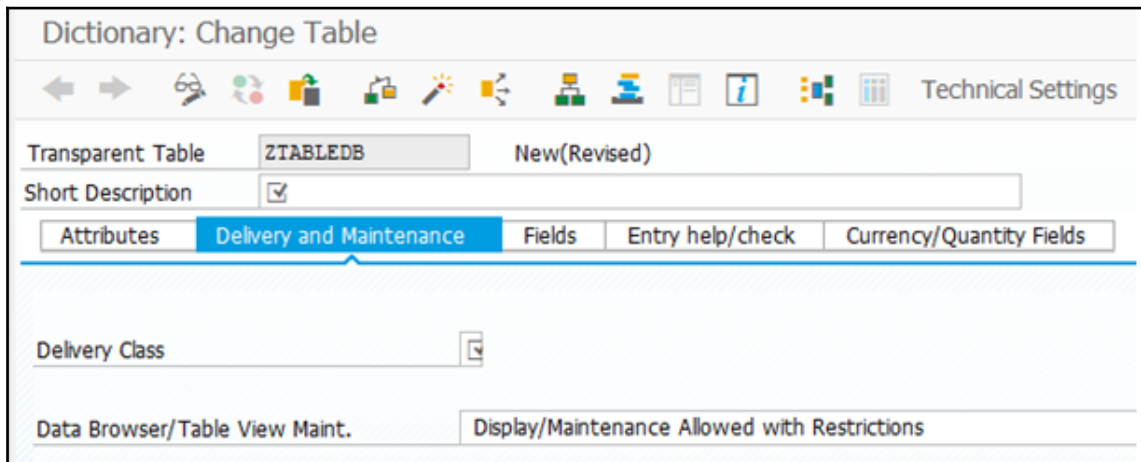
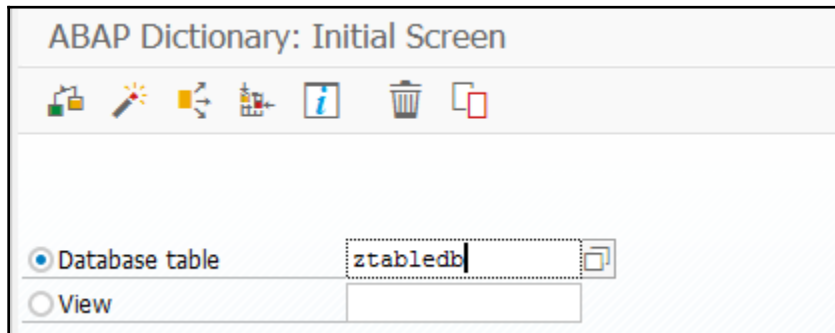
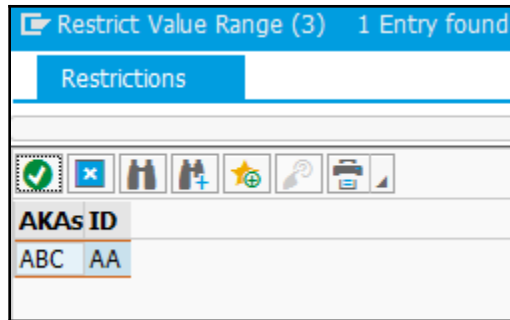
Full Text Fuzzy Search (Database-Specific)

Accuracy Value for Error-Tolerant Full Text Search: 0, 8

Search help exit:

Parameter

Search help parameter	IMP	EXP	LPos	SPos	SDis	Data element	M...	Default value
VALUECHAR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	1	<input type="checkbox"/>	ZAKA	<input type="checkbox"/>	
CARRID	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	2	<input type="checkbox"/>	S_CARR_ID	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	





Dictionary: Change Table




Transparent Table: ZTABLEDB      New(Revised)

Short Description: Example

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

Field	Key	Initial Values	Data element	Data Type	Length	Deci...	Short Description
<u>MANDT</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S_MANDT	CLNT	3	0	Client
<u>CARRID</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	S_CARR_ID	CHAR	3	0	Airline Code
<u>CONNID</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_CONN_ID	NUMC	4	0	Flight Connection Number
<u>FLDATE</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S_DATE	DATS	8	0	Flight date
<u>VALUECHAR</u>	<input type="checkbox"/>	<input type="checkbox"/>		CHAR	3	0	

### Dictionary: Maintain Technical Settings


  Revised<->Active 

Name	ZTABLEDB	Transparent Table
Short Descript.	Example	
Last Changed	WCIESIELSKI	2019-05-10
Status	New	Not saved

**General Properties** | DB-Specific Properties

---

#### Logical Storage Parameters

Data Class  

Size Category

---

#### Buffering

Buffering Not Allowed  
 Buffering allowed but switched off  
 Buffering Activated

---

#### Buffering Type

Single Records Buffered  
 Generic Area Buffered  
 Fully Buffered

Number of Key Fields

Log Data Changes  
 Write access only with JAVA

Possible Entries: Data Class	
Data Cl.	Description
APPL0	Master data, transparent tables
APPL1	Transaction data, transparent tables
APPL2	Organization and customizing
DDIM	Dimension Tables in BW
DFACT	Facts Table in BW
DODS	ODS Tables in BW

System Data Types

Possible Entries: Size Category		
0	0 to	14 000
1	14 000 to	58 000
2	58 000 to	230 000
3	230 000 to	930 000
4	930 000 to	3 700 000
5	3 700 000 to	7 400 000
6	7 400 000 to	14 000 000
7	14 000 000 to	29 000 000
8	29 000 000 to	59 000 000
9	59 000 000 to	2,300000E+09

## Chapter 3: Database Access in ABAP

Client	Airline	Flight No.	Flight Date	Airfare	Currency	Plane Type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
400	AA	17	20.05.2015	422,94	USD	747-400	385	375	193.508,04	31	31	21	19
400	AA	17	17.06.2015	422,94	USD	747-400	385	372	191.490,54	31	30	21	20
400	AA	17	15.07.2015	422,94	USD	747-400	385	374	193.596,86	31	29	21	21
400	AA	17	12.08.2015	422,94	USD	747-400	385	366	190.259,80	31	30	21	20
400	AA	17	09.09.2015	422,94	USD	747-400	385	373	195.246,25	31	31	21	21
400	AA	17	07.10.2015	422,94	USD	747-400	385	373	190.475,54	31	30	21	19
400	AA	17	04.11.2015	422,94	USD	747-400	385	363	186.889,01	31	30	21	19
400	AA	17	02.12.2015	422,94	USD	747-400	385	374	193.190,71	31	29	21	20
400	AA	17	30.12.2015	422,94	USD	747-400	385	371	193.537,46	31	30	21	21
400	AA	17	27.01.2016	422,94	USD	747-400	385	124	64.045,87	31	9	21	7
400	AA	17	24.02.2016	422,94	USD	747-400	385	77	39.904,41	31	6	21	4
400	AA	17	23.03.2016	422,94	USD	747-400	385	143	73.781,98	31	11	21	8
400	AA	17	20.04.2016	422,94	USD	747-400	385	84	44.002,81	31	7	21	5
400	AA	17	18.05.2016	422,94	USD	747-400	385	41	20.423,81	31	3	21	2
400	AA	17	15.06.2016	422,94	USD	747-400	385	0	0,00	31	0	21	0

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0
400	AA	17					0	0		0	0	0	0

Graphic Bundle

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
400	AA	17					0	0		0	0	0	0
400	AA	64					0	0		0	0	0	0
400	AZ	555					0	0		0	0	0	0
400	AZ	788					0	0		0	0	0	0
400	AZ	789					0	0		0	0	0	0
400	AZ	790					0	0		0	0	0	0
400	DL	106					0	0		0	0	0	0
400	DL	1699					0	0		0	0	0	0
400	DL	1984					0	0		0	0	0	0
400	JL	407					0	0		0	0	0	0
400	JL	408					0	0		0	0	0	0
400	LH	400					0	0		0	0	0	0
400	LH	401					0	0		0	0	0	0
400	LH	402					0	0		0	0	0	0
400	LH	2402					0	0		0	0	0	0
400	LH	2407					0	0		0	0	0	0

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
001	AA						0	0		0	0	0	0
006	AA						0	0		0	0	0	0
006	AA						0	0		0	0	0	0
006	AA						0	0		0	0	0	0

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		17					0	0		0	0	0	0
AA		64					0	0		0	0	0	0
AA		64					0	0		0	0	0	0
AA		64					0	0		0	0	0	0

Client	Airline	Flight No.	Flight Date	Airfare	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
UA		3517					0	0		0	0	0	0
AA		17	20.05.2015	422,94			0	0		0	0	0	0
AA		17	17.06.2015	422,94			0	0		0	0	0	0
AA		17	15.07.2015	422,94			0	0		0	0	0	0
AA		17	12.08.2015	422,94			0	0		0	0	0	0
AA		17	09.09.2015	422,94			0	0		0	0	0	0
AA		17	07.10.2015	422,94			0	0		0	0	0	0
AA		17	04.11.2015	422,94			0	0		0	0	0	0
AA		17	02.12.2015	422,94			0	0		0	0	0	0

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		400					0	0		0	0	0	0
LH		401					0	0		0	0	0	0
LH		401					0	0		0	0	0	0
LH		401					0	0		0	0	0	0
LH		401					0	0		0	0	0	0
LH		401					0	0		0	0	0	0

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0
LH		2407					0	0		0	0	0	0

Client	Airline	Flight No.	Date	Price	Currency	Pl.type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
☐	AA	17					0	0		0	0	0	0
	AA	64					0	0		0	0	0	0
	AZ	555					0	0		0	0	0	0
	AZ	788					0	0		0	0	0	0
	AZ	789					0	0		0	0	0	0
	AZ	790					0	0		0	0	0	0
	DL	106					0	0		0	0	0	0
	DL	1699					0	0		0	0	0	0
	DL	1984					0	0		0	0	0	0
	JL	407					0	0		0	0	0	0
	JL	408					0	0		0	0	0	0
	LH	400					0	0		0	0	0	0
	LH	401					0	0		0	0	0	0
	LH	402					0	0		0	0	0	0
	LH	2402					0	0		0	0	0	0
	LH	2407					0	0		0	0	0	0
	QF	5					0	0		0	0	0	0
	QF	6					0	0		0	0	0	0
	SQ	2					0	0		0	0	0	0
	SQ	15					0	0		0	0	0	0
	SQ	158					0	0		0	0	0	0
	SQ	988					0	0		0	0	0	0
	UA	941					0	0		0	0	0	0
	UA	3504					0	0		0	0	0	0
	UA	3516					0	0		0	0	0	0
	UA	3517					0	0		0	0	0	0

Client	Airline	Flight No.	Date	Price	Currency	Plane Type	Capacity	Occupied	Total	Capacity	Occupied	Capacity	Occupied
☐	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0
	AA	17				747-400	0	0		0	0	0	0



Client	Airline	Flight No.	Flight Date	Country	Depart.cit	Depart	Country	Dest.	Target
400	AA	17	20.05.2015						
400	AA	17	17.06.2015						
400	AA	17	15.07.2015						
400	AA	17	12.08.2015						
400	AA	17	09.09.2015						
400	AA	17	07.10.2015						
400	AA	17	04.11.2015						
400	AA	17	02.12.2015						
400	AA	17	30.12.2015						
400	AA	17	27.01.2016						
400	AA	17	24.02.2016						
400	AA	17	23.03.2016						
400	AA	17	20.04.2016						
400	AA	17	18.05.2016						
400	AA	17	15.06.2016						
400	AA	64	22.05.2015						
400	AA	64	19.06.2015						
400	AA	64	17.07.2015						
400	AA	64	14.08.2015						

Client	Airline	Flight No.	Date	Country	Depart. city	Depart	Country	Arrival city	Target
400	AA	17		US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	64		US	SAN FRANCISCO	SFO	US	NEW YORK	JFK
400	AZ	555		IT	ROME	FCO	DE	FRANKFURT	FRA
400	AZ	788		IT	ROME	FCO	JP	TOKYO	TYO
400	AZ	789		JP	TOKYO	TYO	IT	ROME	FCO
400	AZ	790		IT	ROME	FCO	JP	OSAKA	KIX
400	DL	106		US	NEW YORK	JFK	DE	FRANKFURT	FRA
400	DL	1699		US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	DL	1984		US	SAN FRANCISCO	SFO	US	NEW YORK	JFK
400	JL	407		JP	TOKYO	NRT	DE	FRANKFURT	FRA
400	JL	408		DE	FRANKFURT	FRA	JP	TOKYO	NRT
400	LH	400		DE	FRANKFURT	FRA	US	NEW YORK	JFK
400	LH	401		US	NEW YORK	JFK	DE	FRANKFURT	FRA
400	LH	402		DE	FRANKFURT	FRA	US	NEW YORK	JFK
400	LH	2402		DE	FRANKFURT	FRA	DE	BERLIN	SXF
400	LH	2407		DE	BERLIN	TXL	DE	FRANKFURT	FRA
400	QF	5		SG	SINGAPORE	SIN	DE	FRANKFURT	FRA
400	QF	6		DE	FRANKFURT	FRA	SG	SINGAPORE	SIN
400	SQ	2		SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO
400	SQ	15		US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN
400	SQ	158		SG	SINGAPORE	SIN	ID	JAKARTA	JKT
400	SQ	988		SG	SINGAPORE	SIN	JP	TOKYO	TYO
400	UA	941		DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO
400	UA	3504		US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA
400	UA	3516		US	NEW YORK	JFK	DE	FRANKFURT	FRA
400	UA	3517		DE	FRANKFURT	FRA	US	NEW YORK	JFK

Client	Airline	Flight No.	Flight Date	Country	Depart. city	Depart	Country	Arrival city	Target
400	AA	17	20.05.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	17.06.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	15.07.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	12.08.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	09.09.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	07.10.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	04.11.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	02.12.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	30.12.2015	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	27.01.2016	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	24.02.2016	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	23.03.2016	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	20.04.2016	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	18.05.2016	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	17	15.06.2016	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO
400	AA	64	22.05.2015	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK
400	AA	64	19.06.2015	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK
400	AA	64	17.07.2015	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK
400	AA	64	14.08.2015	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK

**ST05 Performance Trace**

Activate Trace   Activate Trace with Filter   Deactivate Trace   Display Trace   Display Trace Directory

Select Trace Type	Configure Trace
<input checked="" type="checkbox"/> SQL Trace	<b>Stack Trace</b> <input type="radio"/> On <input checked="" type="radio"/> Off
<input type="checkbox"/> Buffer Trace	<b>Progress Display</b> <input type="radio"/> On <input checked="" type="radio"/> Off
<input type="checkbox"/> Enqueue Trace	
<input type="checkbox"/> RFC Trace	
<input type="checkbox"/> HTTP Trace	
<input type="checkbox"/> APC trace	
<input type="checkbox"/> AMC Trace	

Trace State

All traces are switched off

### ST05 Filter Conditions for Trace Records

SQL Trace       BUF Trace       Enqueue Trace  
 RFC Trace       HTTP Trace  
 APC Trace       AMC Trace

Trace Period

Date:  To:

Time:  .  To:  .

Trace Filter

Client	<input type="text"/>	
User Name	<input type="text"/>	
Object Name	<input type="text"/>	
Duration [Microsecs]	<input type="text"/>	
Executed Operation	<input type="text"/>	
Database Connection	<input type="text"/>	
Database Connection ID	<input type="text"/>	
Work Process ID	<input type="text"/>	
Transaction ID	<input type="text"/>	
EPP Root Context ID	<input type="text"/>	
EPP Connection ID	<input type="text"/>	
EPP Connection Counter	<input type="text"/>	

No. of Records:

### Performance Analysis: Trace Display (Main Records)

Start Time	Duration	Records	Program Name	Object Name	Statement
	2.050	356			
19:56:37.010	2.046	356	Z_MASTERING	SFLIGHT, SPFLI	SELECT <JOIN> WHERE "SF". "MANDT" = '800' /* R3:Z_MASTERING:22 T:SFLIGHT M:800 */ /*unc.rd.*/

### Runtime Analysis

Tips & Tricks

Measr. Evaluate

---

#### Measurement

The measurement times are reliable

Short Description

---

#### Settings

Variant  From User

---

<h4>In Dialog</h4> <p><input type="radio"/> Transaction <input type="text"/></p> <p><input checked="" type="radio"/> Program <input type="text" value="Z_MASTERING"/></p> <p><input type="radio"/> Function Module <input type="text"/></p> <p><input checked="" type="checkbox"/> Eval. Immediately <input type="button" value="Execute"/></p>	<h4>In Parallel Session</h4> <p><input checked="" type="checkbox"/> Switch On/Off</p> <p><input checked="" type="checkbox"/> Evaluate Immediately</p> <hr/> <h4>For User/Service</h4> <p><input checked="" type="checkbox"/> Schedule</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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#### Data Formatting

Determine Names of Internal Tables

**Runtime Analysis: Display Measurement**

Date/Time: 16.09.18 / 20:18:12 Object: Z\_MASTERING System: ED3  
 User: WCVWIK Description: DEFAULT

Desktop 1 Hit List DB tables Prof. Times

### Profile Trace Results

Profile	Selec...	Number	Net [microsec]	Net [%]
Runtime Measurement	<input checked="" type="checkbox"/>	287	5.724	100,00
Internal Processing Blocks	<input type="checkbox"/>	147	828	14,47
Data Accesses Internal	<input type="checkbox"/>	31	411	7,18
Data Accesses External	<input type="checkbox"/>	3	2.261	39,50
Miscellaneous	<input type="checkbox"/>	63	1.692	29,56
Load/Generate	<input type="checkbox"/>	42	532	9,29
Runtime Analysis	<input type="checkbox"/>	1	0	0,00

### Hit List

Wystap.	Gross [microsec]	Net [microsec]	Gross [%]	Net [%]	Pole hierarchi	Program
2	1.910	1.910	33,25	33,37	DB: Fetch SFLIGHT	Z_MAST
1	5.724	931	99,65	16,26	Submit Report Z_MASTERING	SAPLSV
1	4.793	411	83,44	7,18	Program Z_MASTERING	SAPLSV
1	351	351	6,11	6,13	DB: Open SFLIGHT	Z_MAST
1	2.056	146	35,79	2,55	Fetch SFLIGHT	Z_MAST
1	2.766	95	48,15	1,66	Dynpro Entry PROCESS DARK	SAPMSS
1	438	87	7,63	1,52	Open Cursor SFLIGHT	Z_MAST
1	84	84	1,46	1,47	Load Report CL_DATAPROVIDER=====CP	SAPLSV
1	1.540	78	26,81	1,36	Dynpro Entry	Z_MAST
1	76	50	1,32	0,87	Load Report Z_MASTERING	SAPLSV
1	45	43	0,78	0,75	Perform INIT_1_PROG	RSDBRUI
4	658	43	11,46	0,75	PBO Dynpro <Generic Identifier>	SAPMSS
5	39	39	0,68	0,68	Import From Shared Buffer 800%L%_SeclogExcludedCaller	SAPFS_
1	33	33	0,57	0,58	Load Report SAPLSFES	SAPLOLE
1	124	29	2,16	0,51	Call Function AC_FLUSH_CALL_INTERNAL	SAPLOLE
1	28	28	0,49	0,49	DB Buffer: Get TABLP GET	SAPMSS
4	2.696	25	46,94	0,44	System Event <Generic Identifier>	Z_MAST
1	23	23	0,40	0,40	Create ABAP Object CL_SRAL_FACTORY_DYMP	CL_SRAL
1	23	23	0,40	0,40	Load Report SAPMSSV0	Z_MAST
1	792	22	13,79	0,38	Perform %_CTL_OUTPUT S	SAPMSS
1	37	22	0,64	0,38	Perform IS_LOGGING_ON	SAPFS_
1	43	22	0,75	0,38	Call M. CL_ABAP_MESSAGE_DIGEST=>CALCULATE_HASH_FOR_CHAR	CL_DSH
1	80	22	1,39	0,38	PERFORM (ext) %_INIT_PBO_FIRST S	Z_MAST
1	21	21	0,37	0,37	Call C SNC_ABAP_SERVICE	CL_ABAP
1	21	21	0,37	0,37	DB Buffer: Get TABLP GET	Z_MAST
1	36	21	0,63	0,37	Perform SHAPE_SSCR	RSDBRUI
1	143	21	2,49	0,37	PERFORM (ext) HOTIFY_SAP_GUI	RADSHPI
1	70	21	1,22	0,37	PERFORM (ext) CALL_SECLOG_HOOK	SAPMSS
1	106	20	1,85	0,35	Call Function VRM_QUEUE_FLUSH_SIGNATURE	SAPLSV
1	18	18	0,31	0,31	Load Report RSDBRUNT	Z_MAST
4	20	17	0,35	0,30	Call Function BDC_RUNNING	SAPLSTT
1	24	17	0,42	0,30	Load Report CL_DYMP_RAL_API=====CP	SAPLSDI
1	40	17	0,70	0,30	Load Dynpro SAPMSSV0 1000	Z_MAST
1	136	17	2,37	0,30	PERFORM (ext) INIT_%_INIT	Z_MAST

### Profile Trace Results

Profile	Selec...	Number	Net [microsec]	Net [%]
Runtime Measurement	<input checked="" type="checkbox"/>	648	5.167	100,00
Internal Processing Blocks	<input type="checkbox"/>	147	1.385	26,80
Data Accesses Internal	<input type="checkbox"/>	392	1.019	19,72
Data Accesses External	<input type="checkbox"/>	3	830	16,06
Miscellaneous	<input type="checkbox"/>	63	1.502	29,07
Load/Generate	<input type="checkbox"/>	42	431	8,34
Runtime Analysis	<input type="checkbox"/>	1	0	0,00

Profile	Selec...	Number	Net [microsec]	Net [%]
▼ Runtime Measurement		1.354	5.983	100,00
> Internal Processing Blocks	<input type="checkbox"/>	147	764	12,77
> Data Accesses Internal	<input type="checkbox"/>	1.098	2.427	40,56
> Data Accesses External	<input type="checkbox"/>	3	937	15,66
> Miscellaneous	<input type="checkbox"/>	63	1.435	23,98
> Load/Generate	<input type="checkbox"/>	42	420	7,02
> Runtime Analysis	<input type="checkbox"/>	1	0	0,00

Profile	Selec...	Number	Net [microsec]	Net [%]
▼ Runtime Measurement		286	5.011	100,00
> Internal Processing Blocks	<input type="checkbox"/>	147	747	14,91
> Data Accesses Internal	<input type="checkbox"/>	30	358	7,14
> Data Accesses External	<input type="checkbox"/>	3	2.034	40,59
> Miscellaneous	<input type="checkbox"/>	63	1.463	29,20
> Load/Generate	<input type="checkbox"/>	42	409	8,16
> Runtime Analysis	<input type="checkbox"/>	1	0	0,00



# Chapter 4: Import and Export to Document Formats



Select Pattern

Statements

- CALL FUNCTION
- ABAP Objects Patterns
- MESSAGE
  - Class
  - Type
  - Number
- SELECT FROM
- PERFORM
- AUTHORITY-CHECK
- WRITE Pattern
- CASE for Status

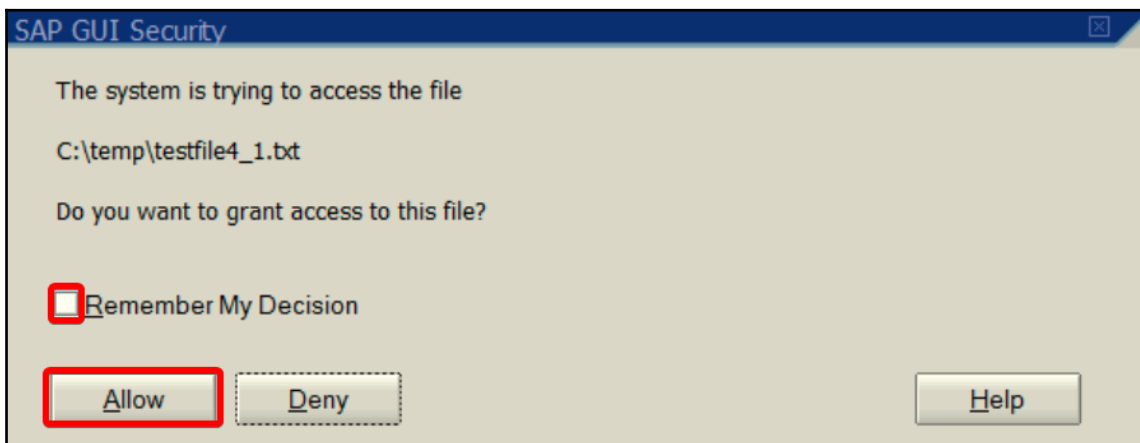
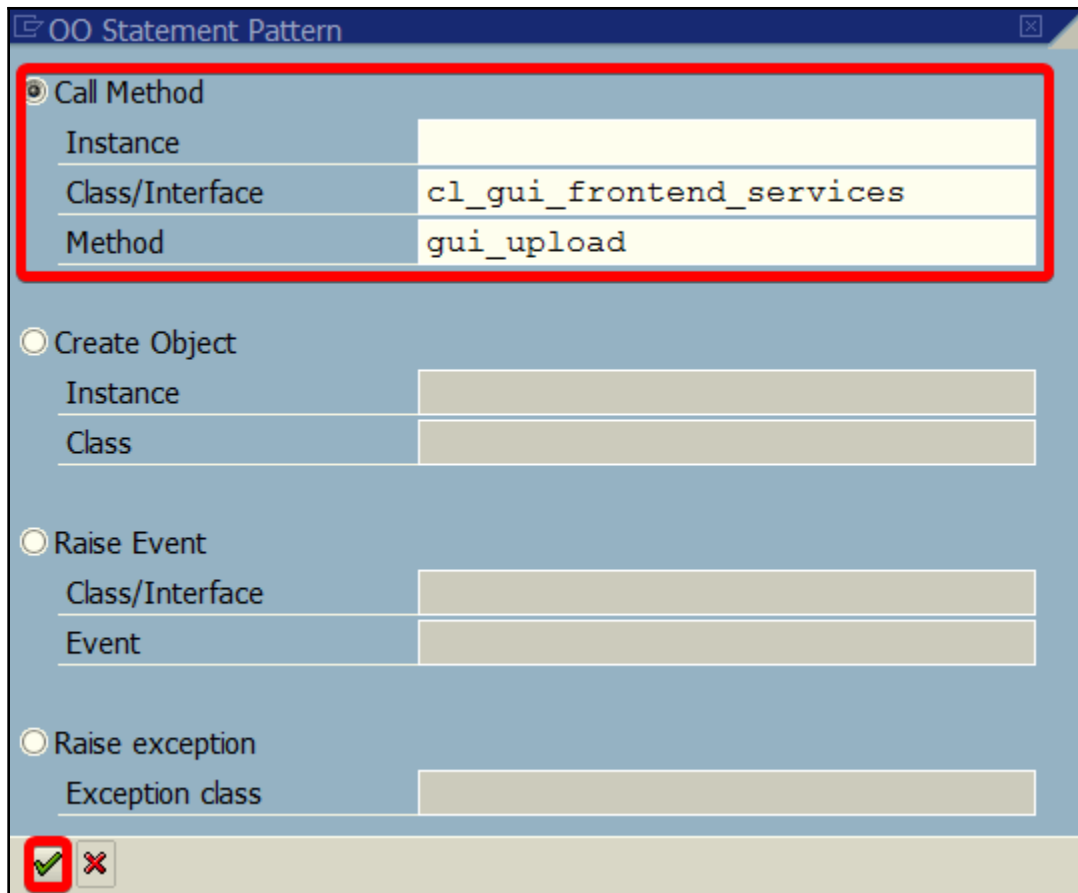
Structured Data Object

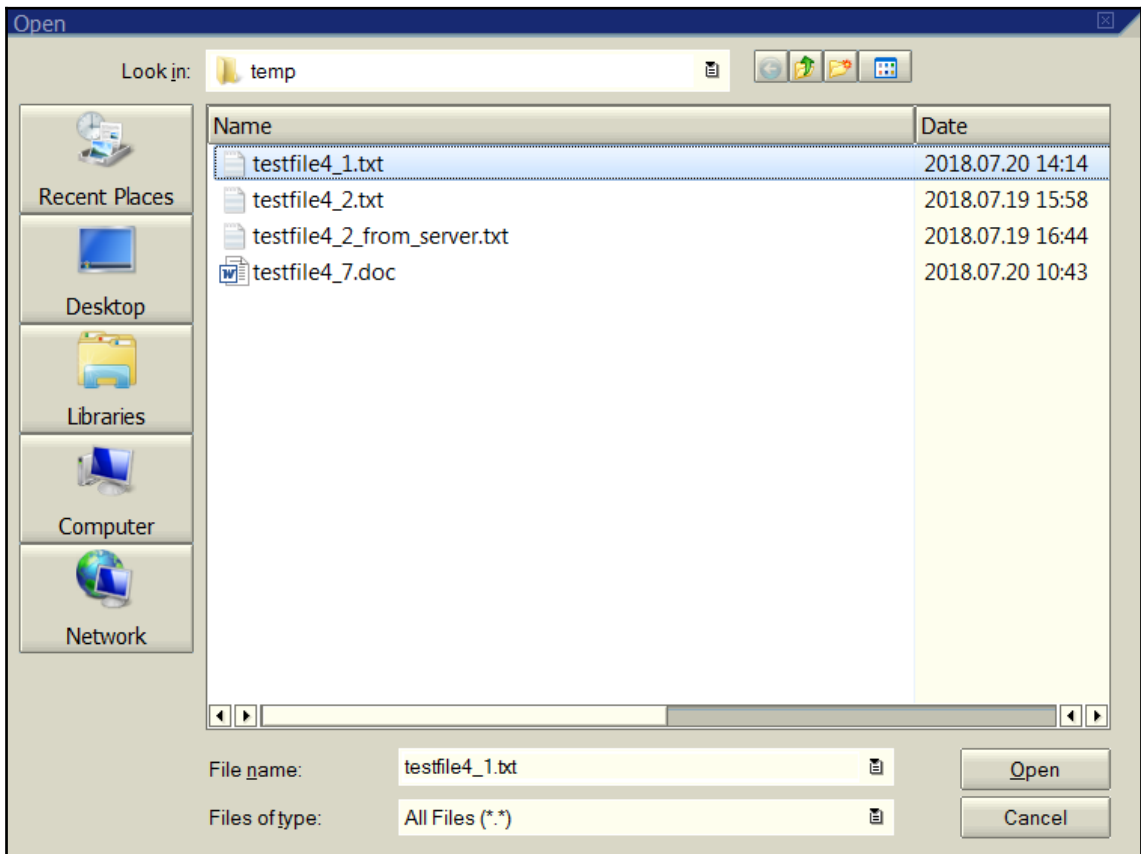
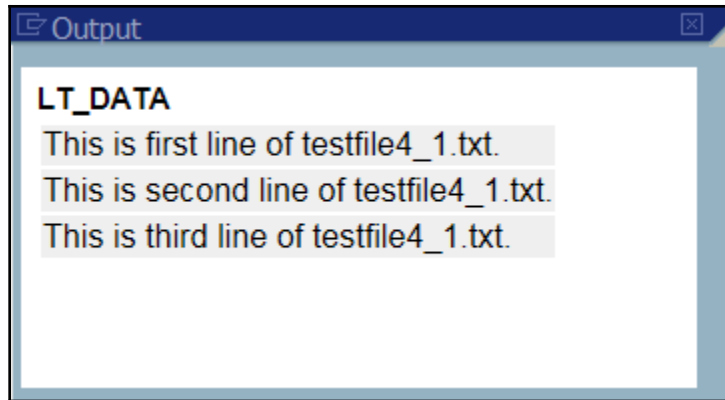
- with fields
- with TYPE

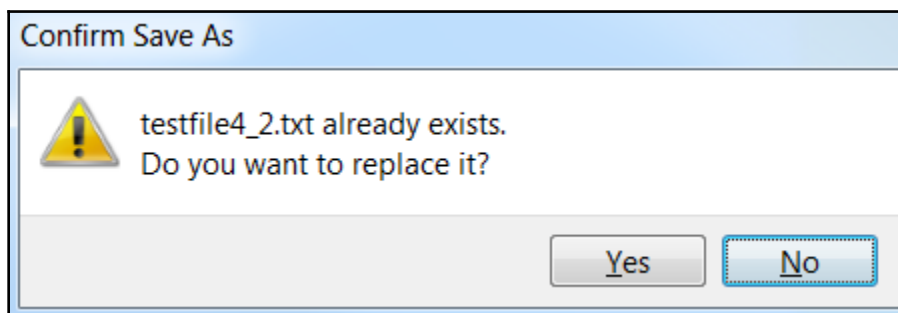
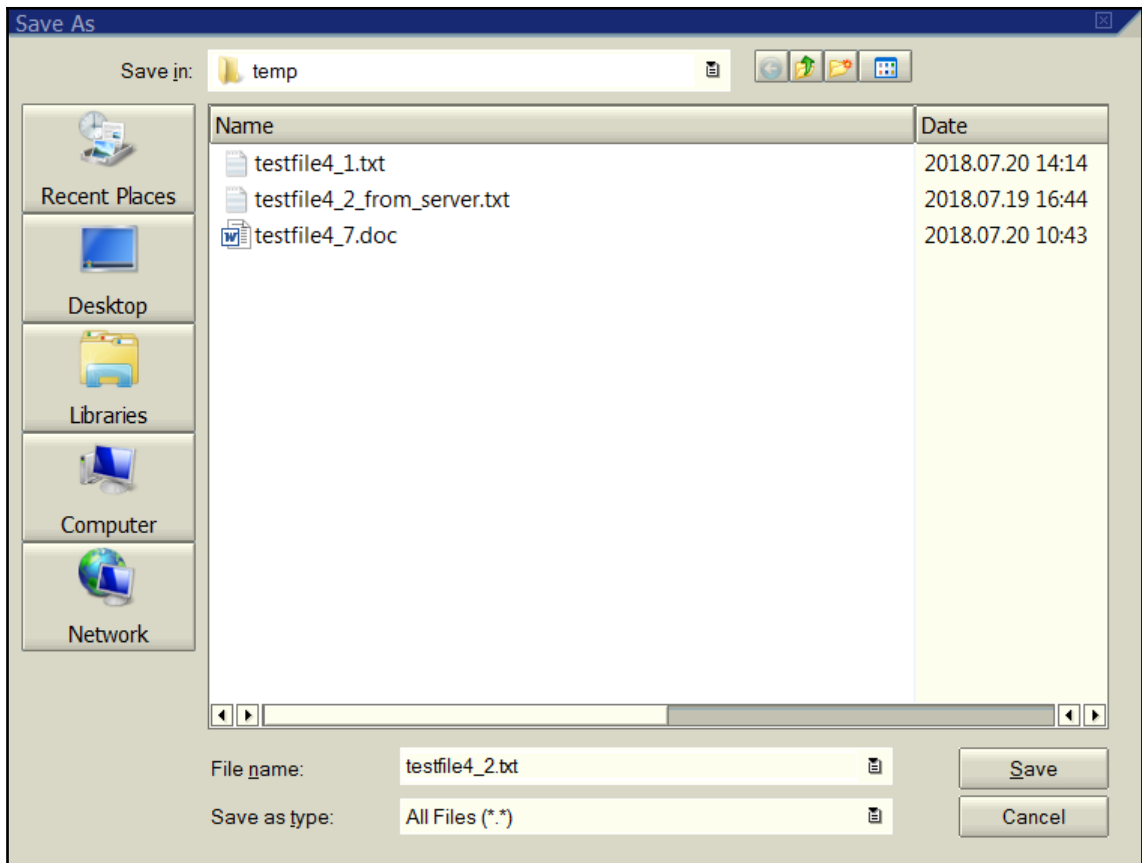
Enterprise Services

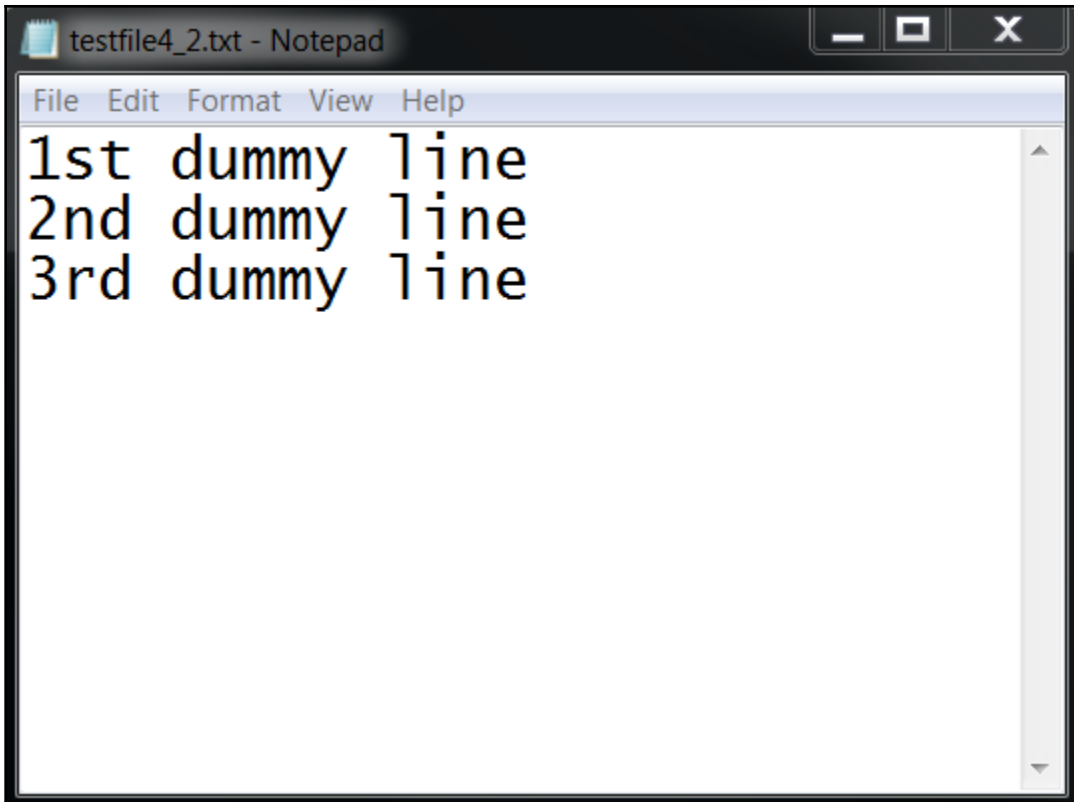
- Service Consumer
- CALL DIALOG
- Other Pattern

✓ ✕





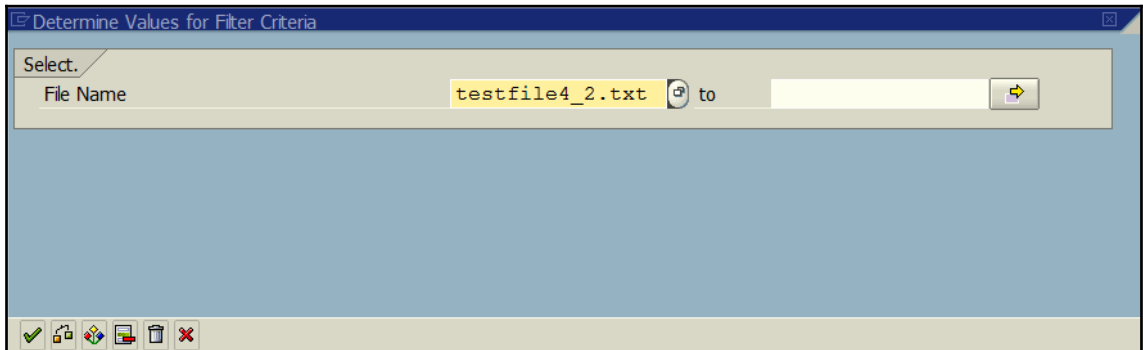
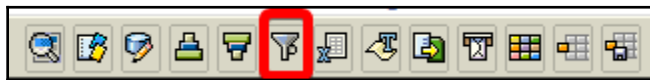
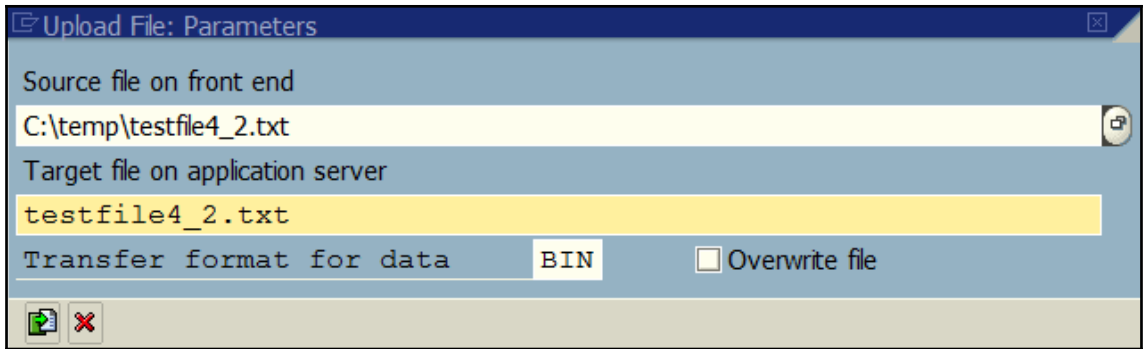




**SAP Directories ( 19.07.2018 14:14:45 HER aronia )**

Name of Directory Parameter	Directory
DIR_ATRA	/usr/sap/HER/DVEBMGS01/data
DIR_BINARY	/usr/sap/HER/DVEBMGS01/exe
DIR_CCMS	/usr/sap/ccms
DIR_CT_LOGGING	/usr/sap/HER/SYS/global
DIR_CT_RUN	/usr/sap/HER/SYS/exe/uc/linuxx86_64
DIR_DATA	/usr/sap/HER/DVEBMGS01/data
DIR_DBMS	/usr/sap/HER/SYS/SAPDB
DIR_EXECUTABLE	/usr/sap/HER/DVEBMGS01/exe
DIR_EXE_ROOT	/usr/sap/HER/SYS/exe
DIR_GEN	/usr/sap/HER/SYS/exe/dbg
DIR_GEN_ROOT	/usr/sap/HER/SYS/gen
DIR_GLOBAL	/usr/sap/HER/SYS/global
DIR_GRAPH_EXE	/usr/sap/HER/DVEBMGS01/exe
DIR_GRAPH_LIB	/usr/sap/HER/DVEBMGS01/exe
DIR_HOME	/usr/sap/HER/DVEBMGS01/work
DIR_INSTALL	/usr/sap/HER/SYS
DIR_INSTANCE	/usr/sap/HER/DVEBMGS01
DIR_LIBRARY	/usr/sap/HER/DVEBMGS01/exe
DIR_LOGGING	/usr/sap/HER/DVEBMGS01/log
DIR_MEMORY_INSPECTOR	/usr/sap/HER/DVEBMGS01/data
DIR_PAGING	/usr/sap/HER/DVEBMGS01/data
DIR_PERF	/usr/sap/tmp
DIR_PROFILE	/usr/sap/HER/SYS/profile
DIR_PUT	/sapmnt/SUM/abap
DIR_REORG	/usr/sap/HER/DVEBMGS01/data
DIR_RSYN	/usr/sap/HER/DVEBMGS01/exe
DIR_SAPHOSTAGENT	/usr/sap/hostctrl
DIR_SAPUSERS	.
DIR_SETUPS	/usr/sap/HER/SYS/profile
DIR_SORTTMP	/usr/sap/HER/DVEBMGS01/data
DIR_SOURCE	/usr/sap/HER/SYS/src
DIR_TEMP	/tmp
DIR_TRANS	/usr/sap/trans
Z1A	/tmp
Z1A	/tmp/asdfasdf
zetc	/etc

AL11 aronia INS

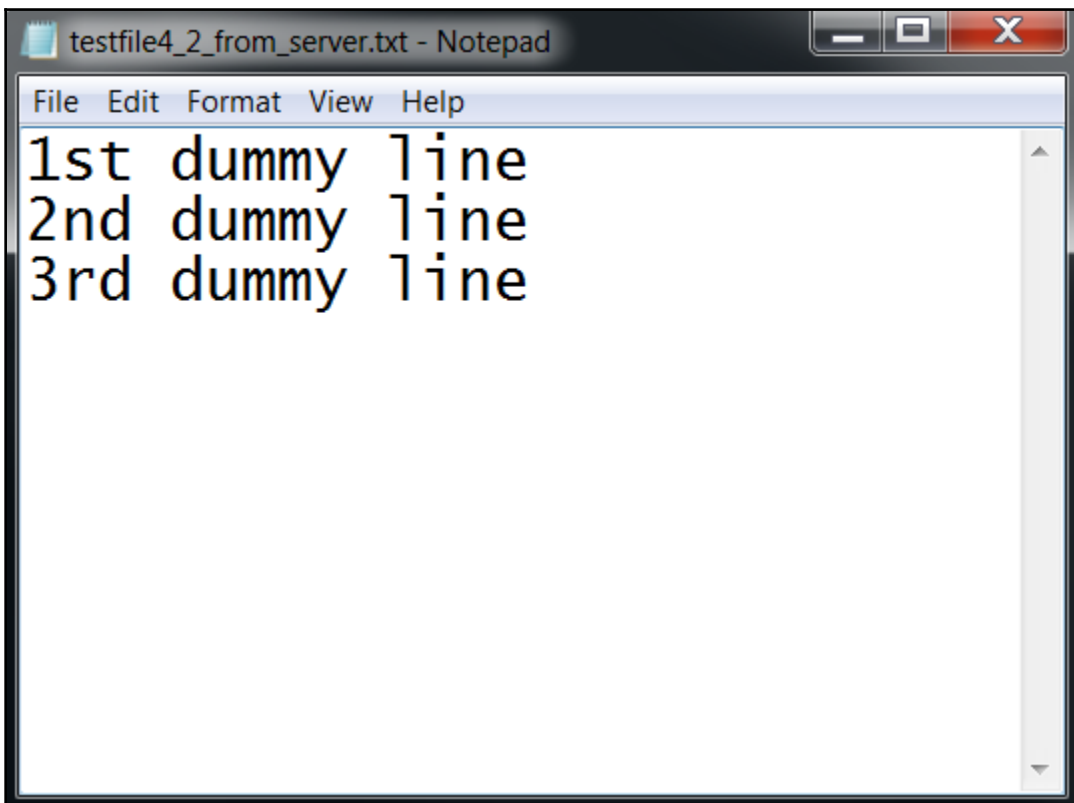
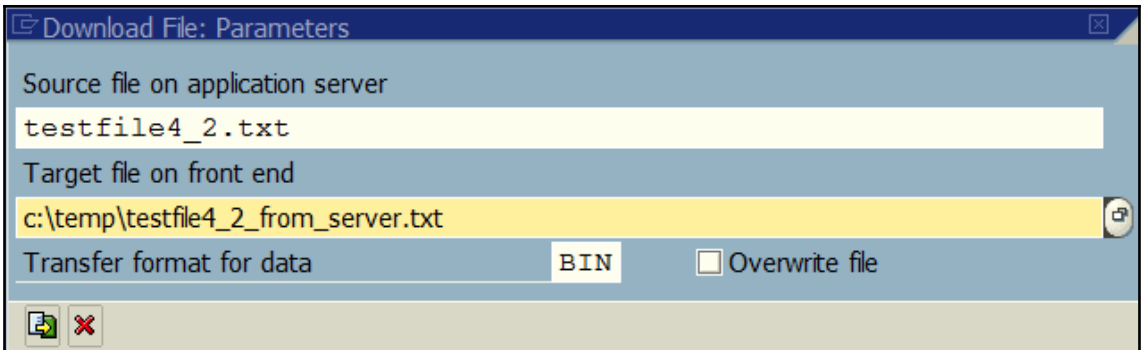


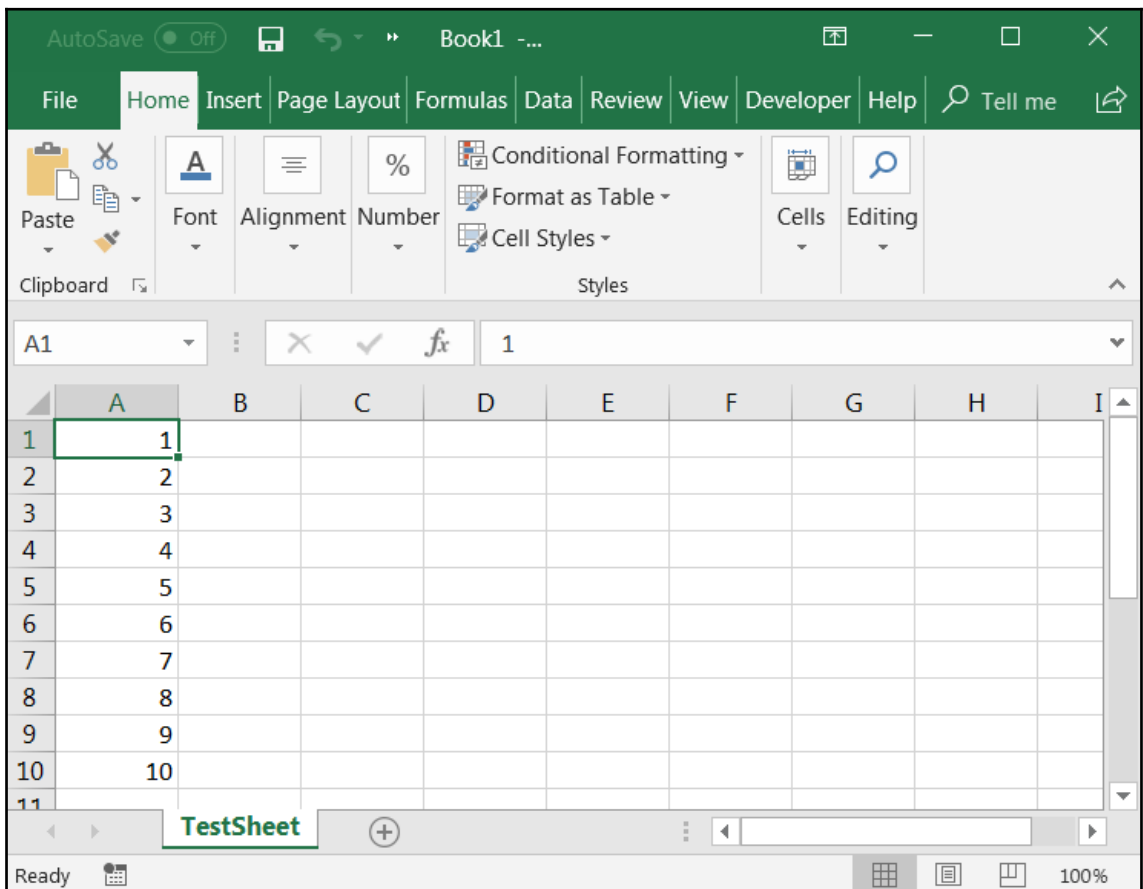
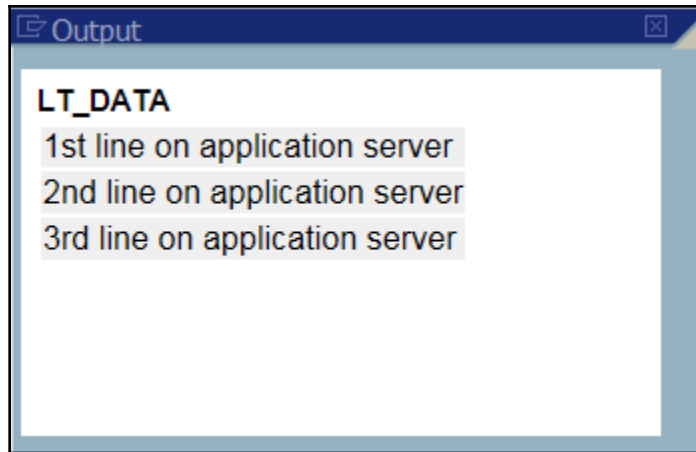
Usable	Viewed	Changed	Length	Owner	Lastchange	Lastchange	File Name
X			48	heradm	20.07.2018	15:16:48	testfile4_2.txt

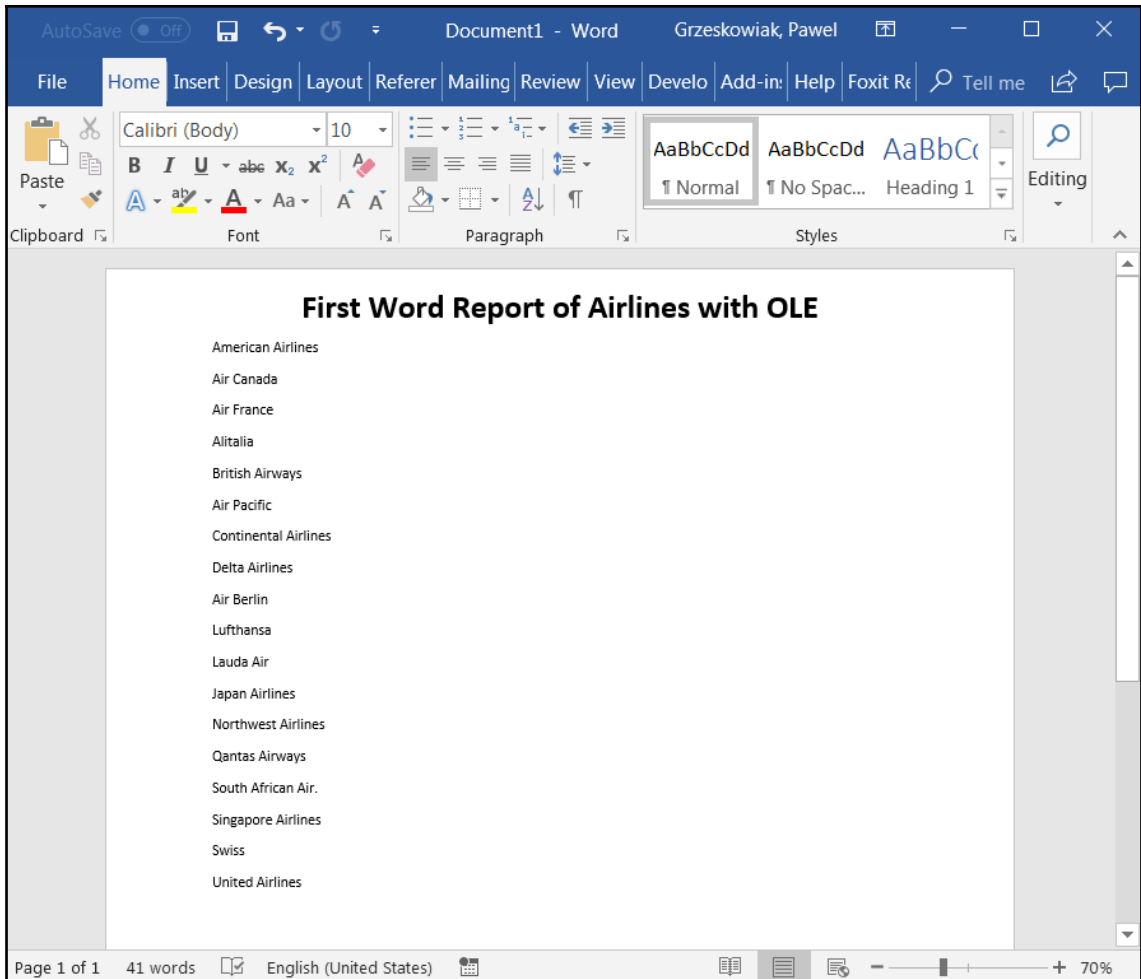
```
Directory: .
Name:      testfile4_2.txt

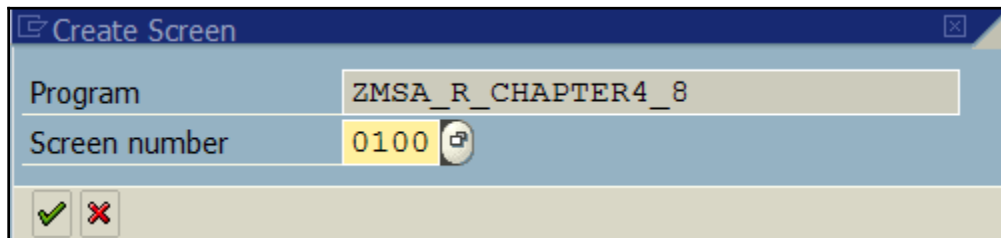
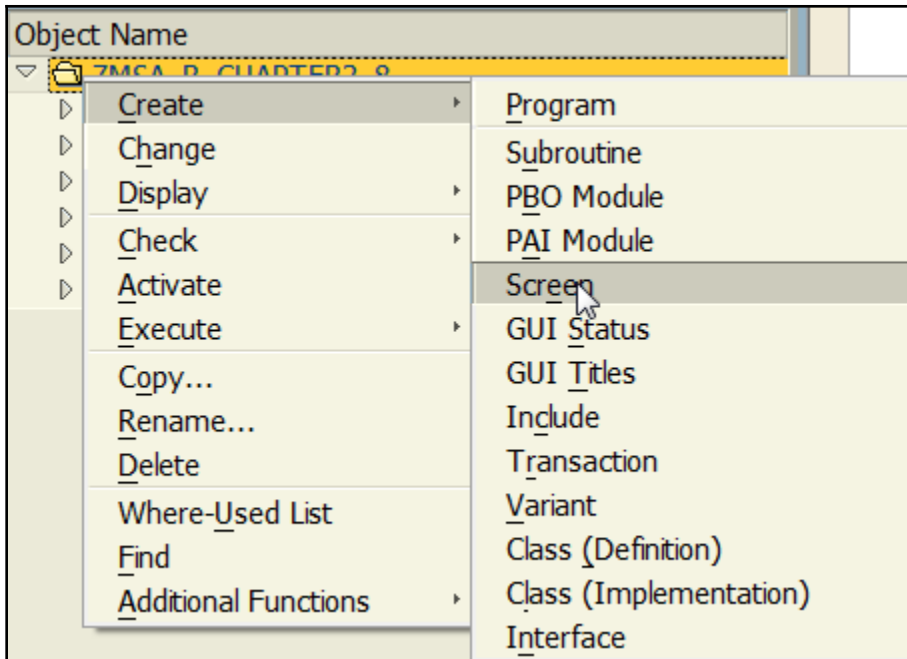
1st dummy line
2nd dummy line
3rd dummy line
```



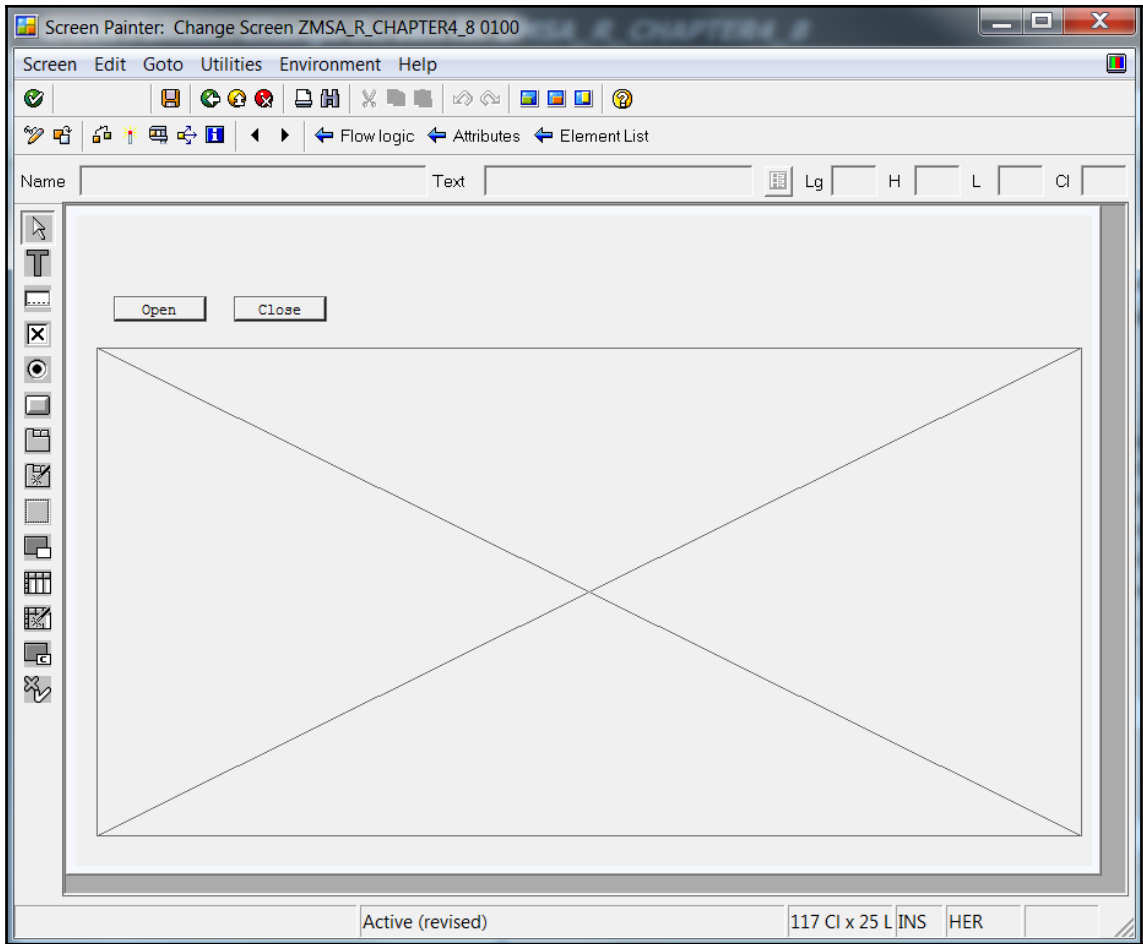


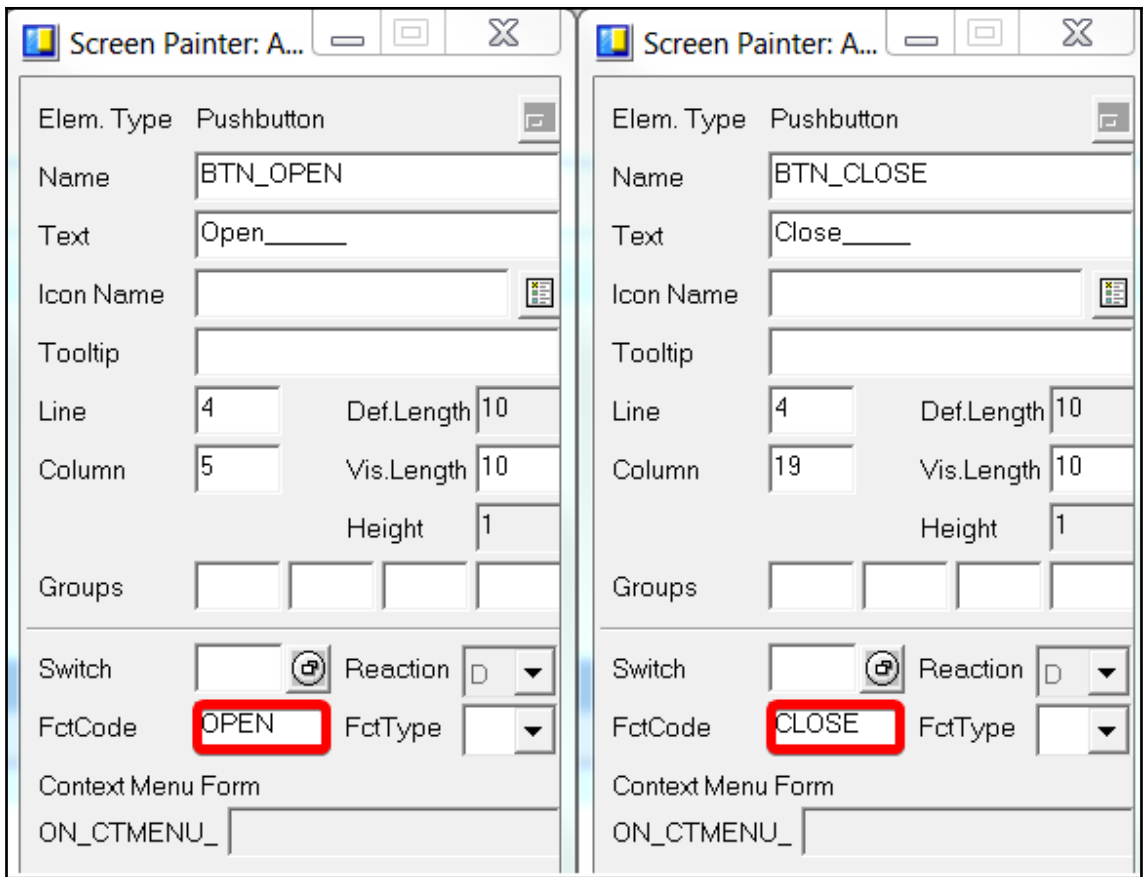






Screen number	100	Active
<b>Attributes</b>   Element list   Flow logic		
Short Description	Simple Screen for DOI Example ZMSA_R_CHAPTER4_8	
Original Language	EN English	Package \$MSA
Last Changed	20.07.2018	11:43:19
Last Generation	20.07.2018	11:44:59
<b>Screen Type</b>		
<input checked="" type="radio"/> Normal		
<input type="radio"/> Subscreen		
<input type="radio"/> Modal dialog box		
<input type="radio"/> Selection Dynpro		
<b>Settings</b>		
<input type="checkbox"/> Hold Data		
<input type="checkbox"/> Switch Off Runtime Compress		
<input type="checkbox"/> Template (Not Executable)		
<input type="checkbox"/> Hold Scroll Position		
<input type="checkbox"/> Without Application Toolbar		
<b>Other Attributes</b>		
Next Dynpro	100	
Cursor Position		
Screen Group		
Rows/Columns	Occupied	24 116
	Editing	25 117
Context Menu FORM ON CTMENU		
		<a href="#">➔ Properties</a>



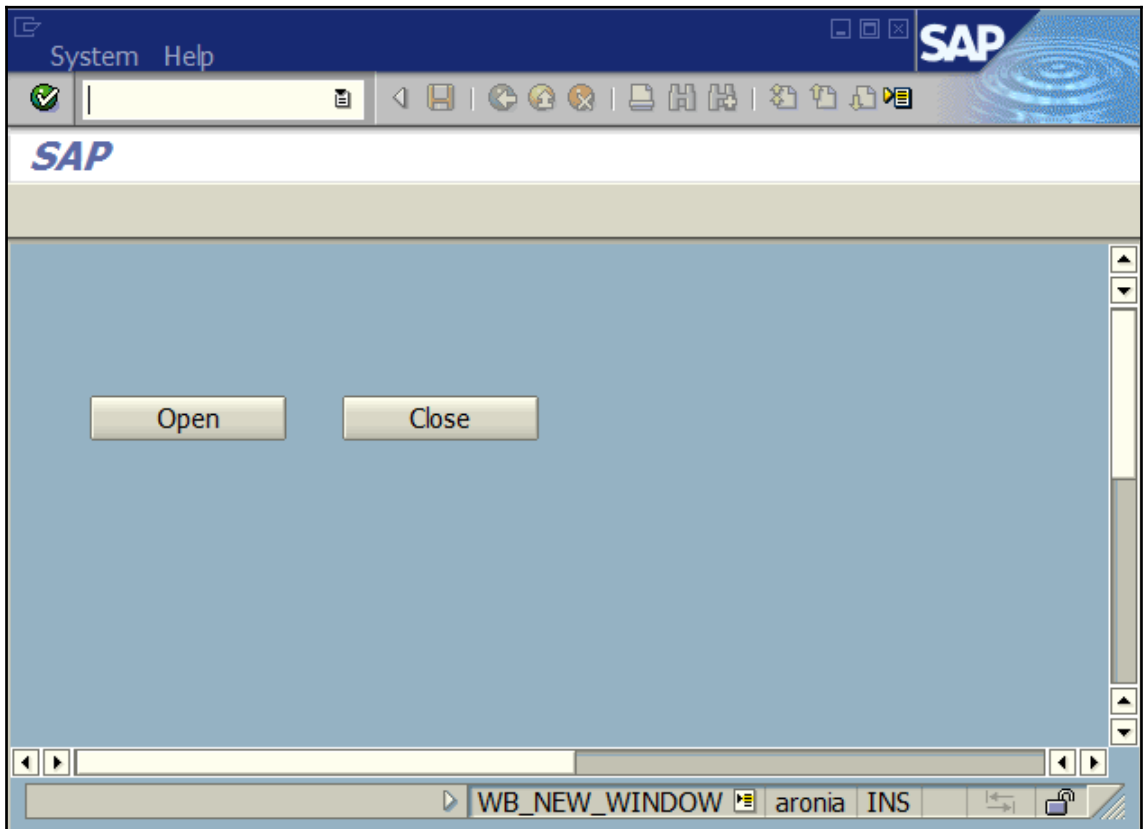
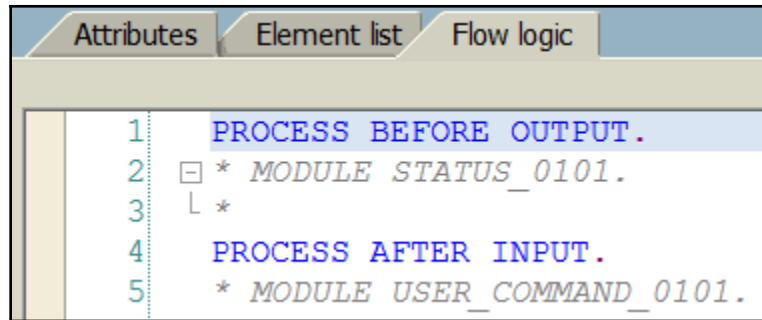


Screen number 100 Active

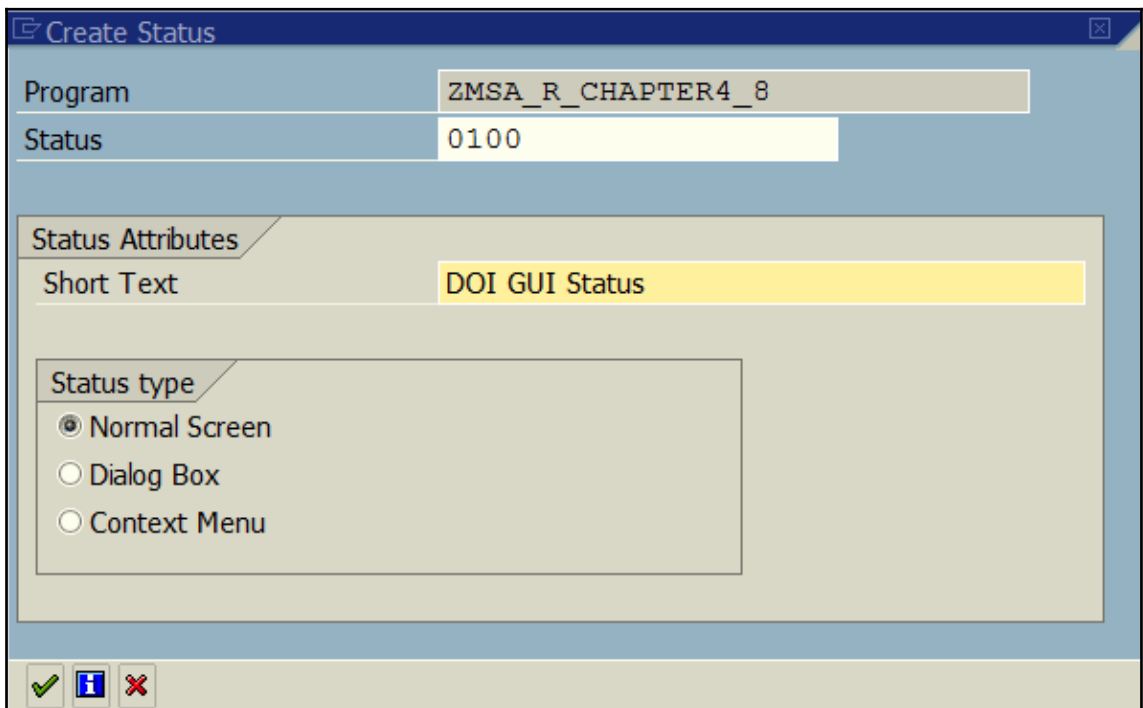
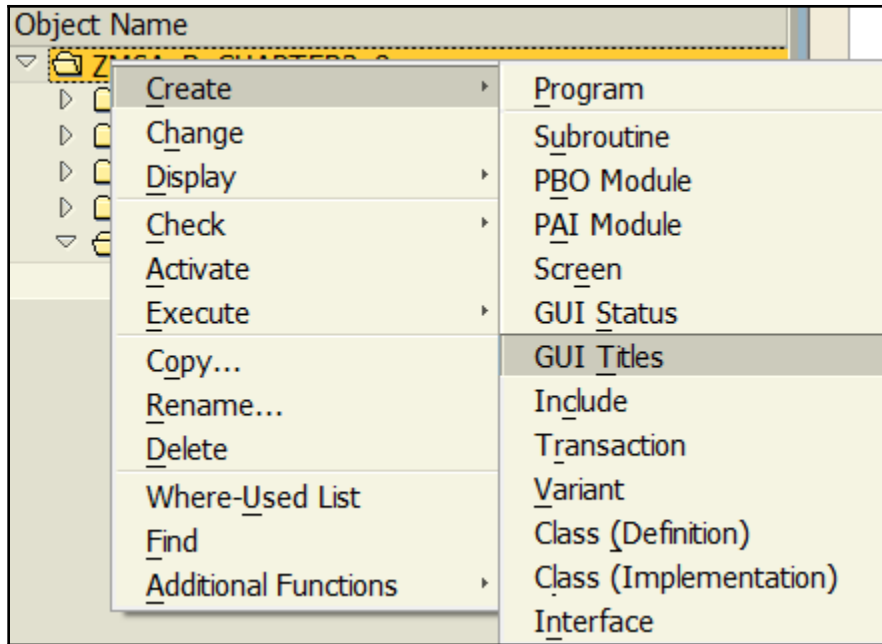
Attributes Element list Flow logic

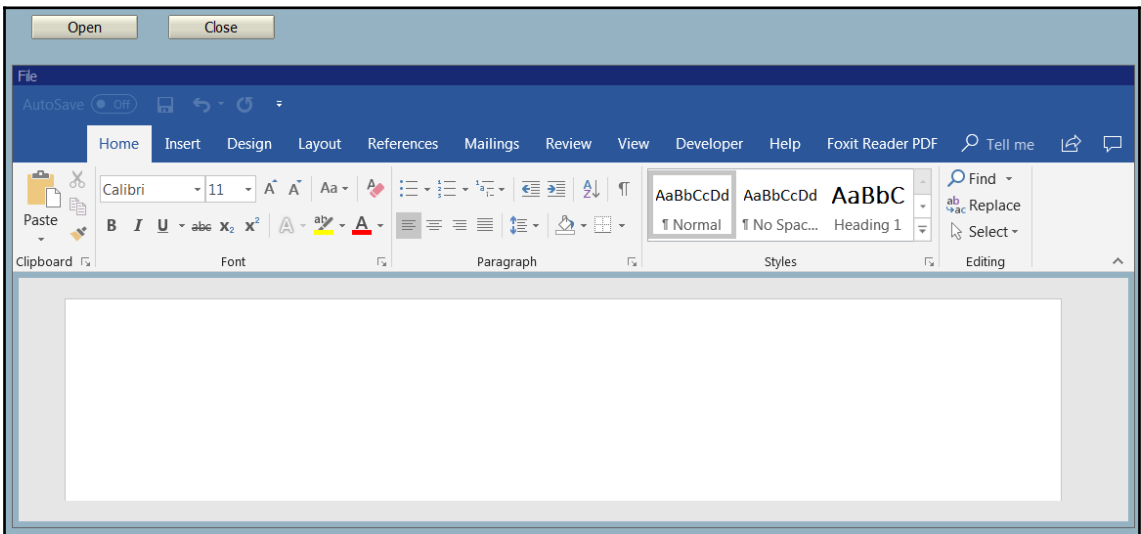
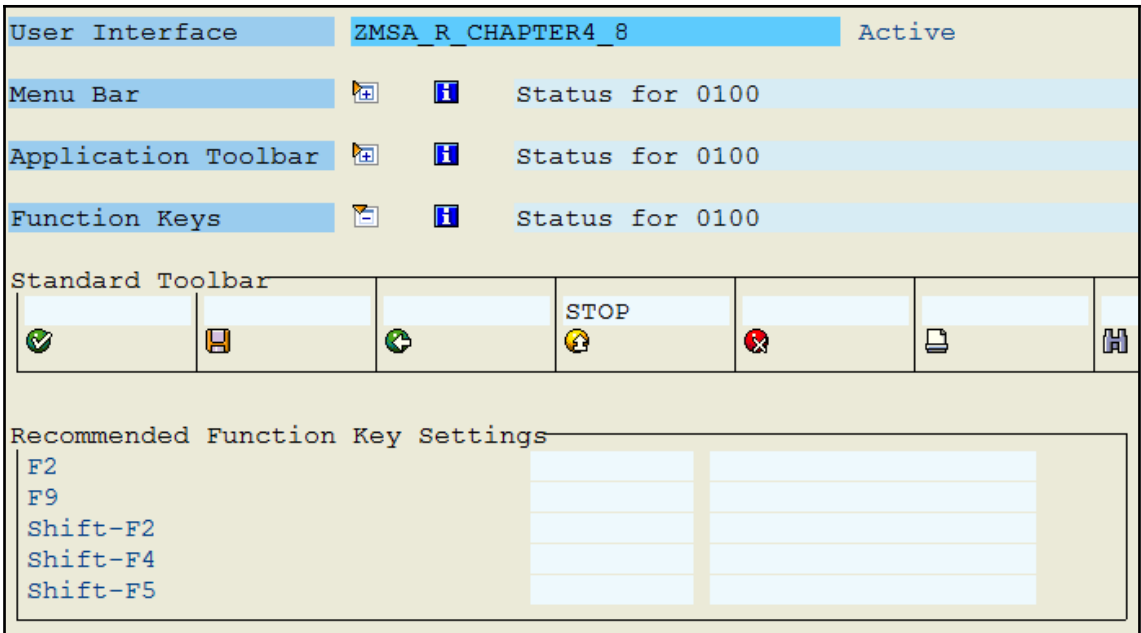
General Texts/I/O Templates Special Display Mod. Groups/Functions

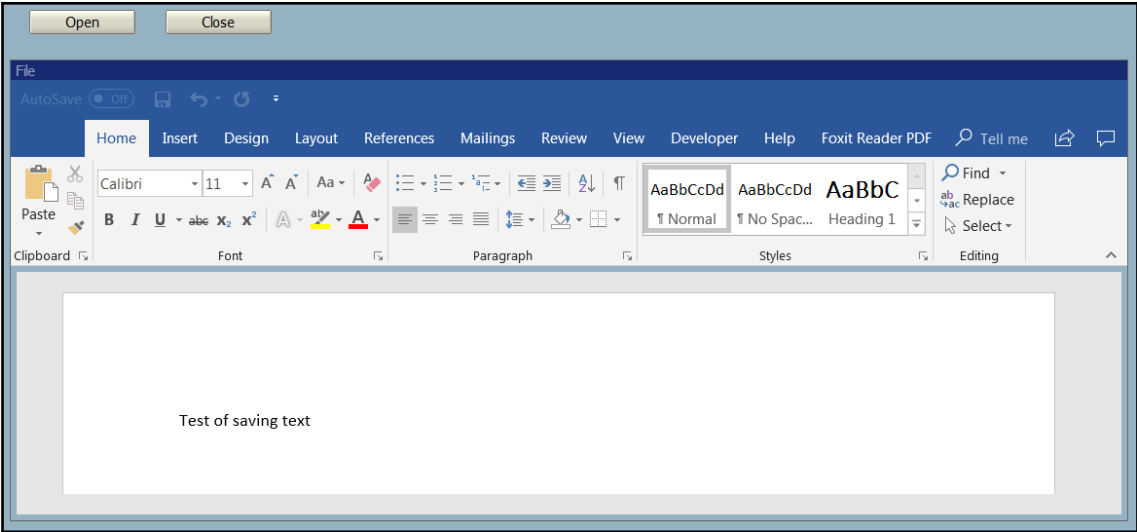
Hi..	M	Name	Type ...	Line	Col..	Def..	VisLg	Hei..	Scr...	Format
		<u>BTN_OPEN</u>	Push	4	5	10	10	1		
		<u>BTN_CLOSE</u>	Push	4	19	10	10	1		
+		<u>CUSTOMCONTAINER</u>	CCtrl	6	3	114	114	19		
		<u>LV_OKCODE</u>	OK	0	0	20	20	1	<input type="checkbox"/>	OK














**Form: Display Header: RVINVOICETH**

Pages | Windows | Page Windows | Paragraph Formats | Character Formats 

Administrative Data | Basic Settings

**Administration Information**

Form: RVINVOICETH  
Description: Invoice/Tax Invoice (Thailand)  
Status: Active - Saved


Classification:   
Package: J1HL THRF Localization Thailand: Development Class for Logistics  
Client ID: 000

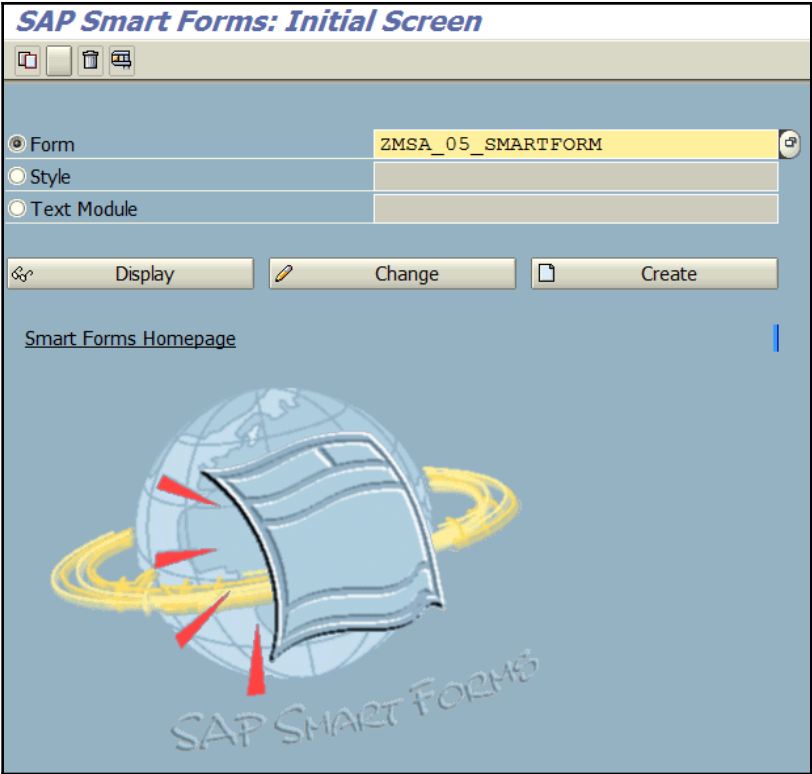
Created on: 19.11.1999 07:33:11 By: SAP Release: 46C  
Changed on: 25.08.2005 23:50:22 By: SAP Release: 700

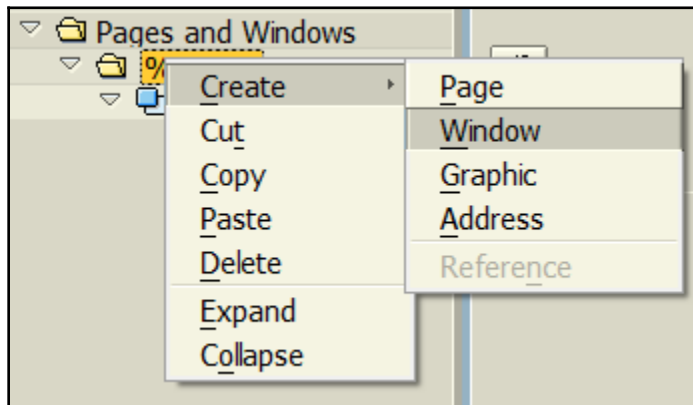
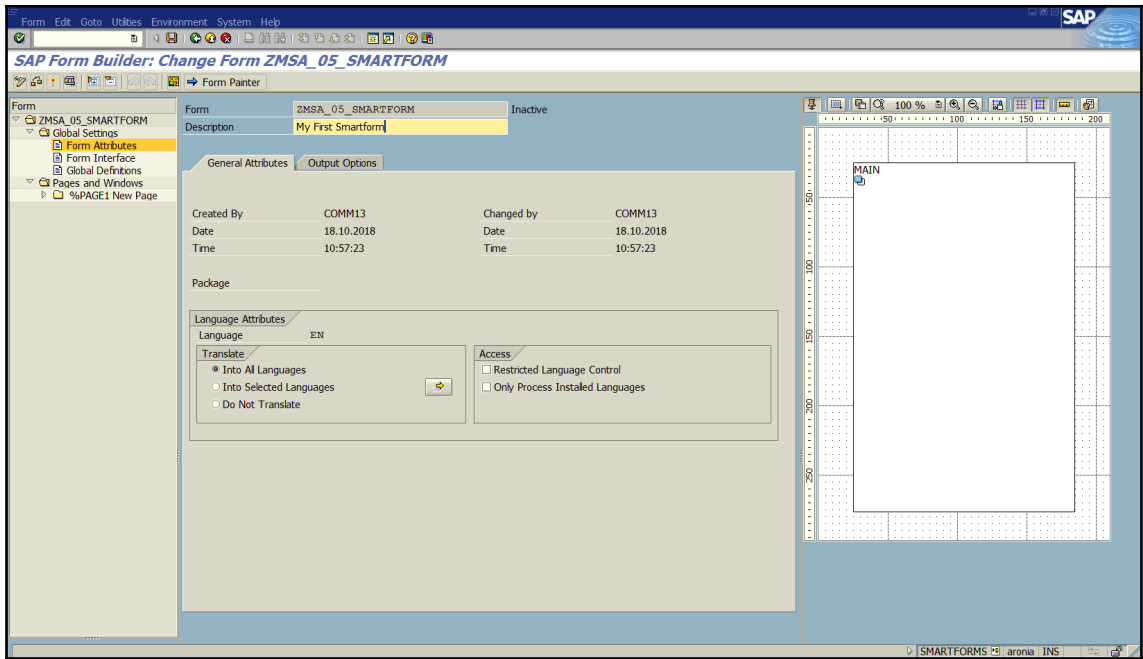
**Language Attributes**

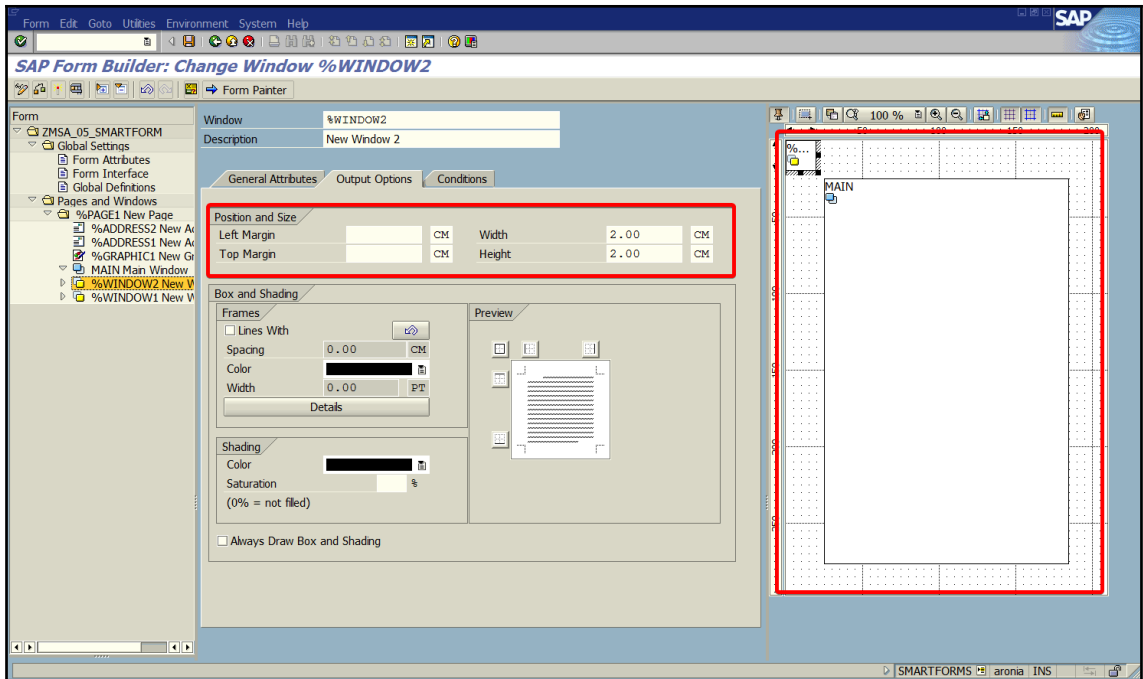
Language Key: EN  
Original language: EN

Translate

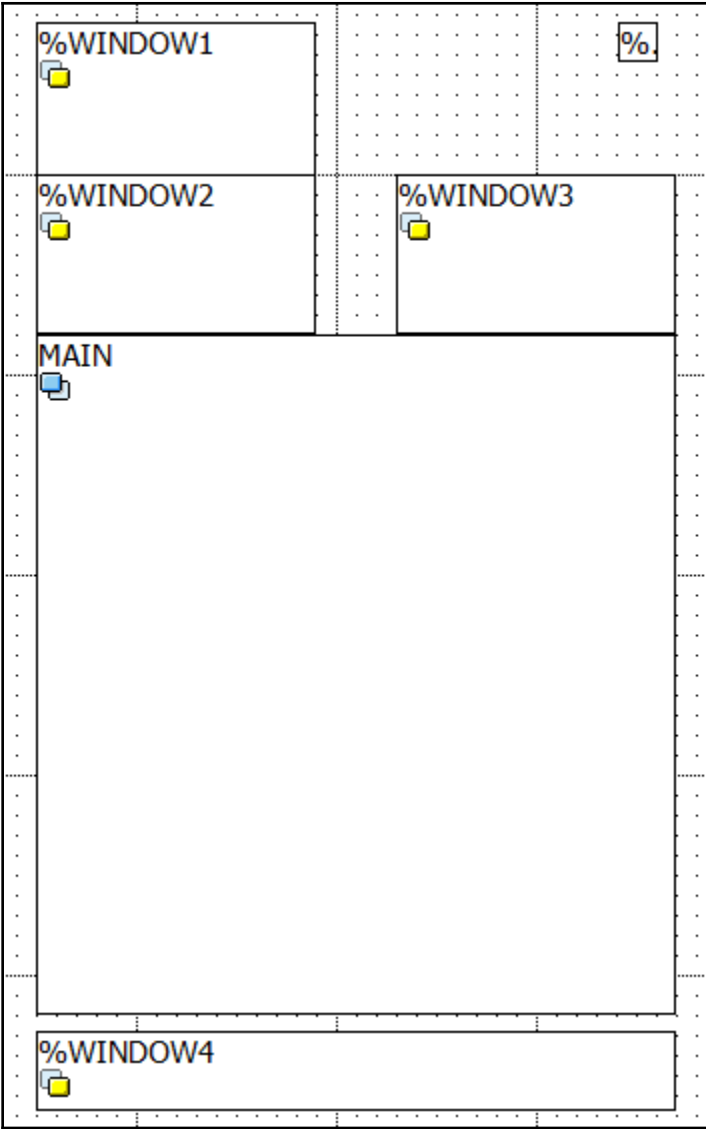
Into All Languages  
 Into selected languages   
 Do Not Translate

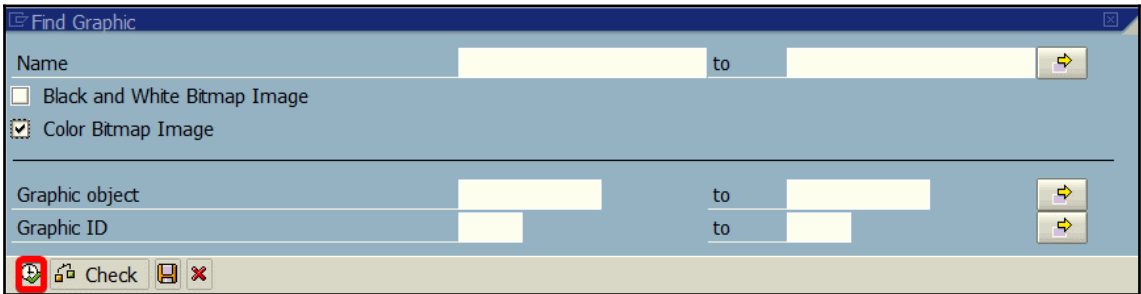
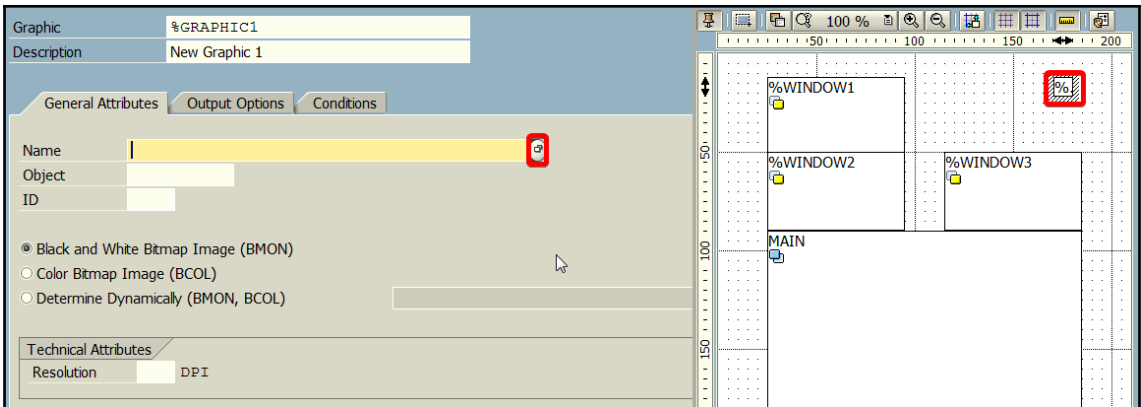












Find Graphic (1) 151 Entries found

Restrictions

Name	Object	ID	GraphicT.	Descript.
/BEV2/ED_SFRET_DEBI_P1_BCOL	GRAPHICS	BMAP	Color Bitmap Image	DEUTSCHE BIERST
/BEV2/ED_SFRET_DEBI_P1_BCOL_2002	GRAPHICS	BMAP	Color Bitmap Image	DT.BIERSTERKL.,2
/BEV2/ED_SFRET_DEBI_P2_BCOL	GRAPHICS	BMAP	Color Bitmap Image	DEUTSCHE BIERST
/BEV2/ED_SFRET_DEBI_P2_BCOL_2002	GRAPHICS	BMAP	Color Bitmap Image	DT.BIERSTERKL.,2
/CCECV/YUFI_PPPDV_VAT200DPI.TIF	GRAPHICS	BMAP	Color Bitmap Image	PPPDV VAT FORM :
/CCECV/BELO_INTA_01	GRAPHICS	BMAP	Color Bitmap Image	ARRIVALS PAGE 01
/CCECV/BELO_INTA_02	GRAPHICS	BMAP	Color Bitmap Image	ARRIVALS PAGE 02
/CCECV/BELO_INTA_03	GRAPHICS	BMAP	Color Bitmap Image	ARRIVALS PAGE 3
/CCECV/BELO_INTR_01	GRAPHICS	BMAP	Color Bitmap Image	DISPATCHES PAGE
/CCECV/BELO_INTR_02	GRAPHICS	BMAP	Color Bitmap Image	DISPATCHES PAGE
/CCECV/BELO_INTR_03	GRAPHICS	BMAP	Color Bitmap Image	DISPATCHES PAGE
/CCECV/BTLO_UPS-01_1	GRAPHICS	BMAP	Color Bitmap Image	INTRASTAT LT: UF
/CCECV/BTLO_UPS-01_2	GRAPHICS	BMAP	Color Bitmap Image	INTRASTAT LT: UF
/CCECV/BTLO_UPS-02_1	GRAPHICS	BMAP	Color Bitmap Image	INTRASTAT LT: UF
/CCECV/BTLO_UPS-02_2	GRAPHICS	BMAP	Color Bitmap Image	INTRASTAT LT: UF
/CCECV/BVLO_1B_01	GRAPHICS	BMAP	Color Bitmap Image	1B PAGE 03
/CCECV/BVLO_1B_02	GRAPHICS	BMAP	Color Bitmap Image	1B PAGE 02
/CCECV/BVLO_1B_03	GRAPHICS	BMAP	Color Bitmap Image	1B PAGE 03
/CCECV/BVLO_2B_01	GRAPHICS	BMAP	Color Bitmap Image	DISPATCHES PAGE
/CCECV/BVLO_2B_02	GRAPHICS	BMAP	Color Bitmap Image	DISPATCHES PAGE
/CCECV/BVLO_2B_03	GRAPHICS	BMAP	Color Bitmap Image	DISPATCHES PAGE
/ISHFR/BILL_GRAFIC	GRAPHICS	BMAP	Color Bitmap Image	IS-H FR: RECHNUN
/ISHFR/BILL_GRAFIC_COL_TIF	GRAPHICS	BMAP	Color Bitmap Image	IS-H FR: RECHNUN
/ISHFR/NINSVERF_REQUEST_P1	GRAPHICS	BMAP	Color Bitmap Image	IS-H FR: KOSTENÜ
/ISHFR/NINSVERF_REQUEST_P2	GRAPHICS	BMAP	Color Bitmap Image	IS-H FR: KOSTENÜ
3U	GRAPHICS	BMAP	Color Bitmap Image	STATUS STOP
8R	GRAPHICS	BMAP	Color Bitmap Image	STATUS WARNING
90	GRAPHICS	BMAP	Color Bitmap Image	REQUEST FEHLERH
BANK	GRAPHICS	BMAP	Color Bitmap Image	BANKING
BNONE	GRAPHICS	BMAP	Color Bitmap Image	
BORANG	GRAPHICS	BMAP	Color Bitmap Image	BORANG LOGO IRE
BORANG_E	GRAPHICS	BMAP	Color Bitmap Image	
CP22A	GRAPHICS	BMAP	Color Bitmap Image	LOGO FOR CP22A
CPF LOGO	GRAPHICS	BMAP	Color Bitmap Image	
DAT2012_PAGE01_V2	GRAPHICS	BMAP	Color Bitmap Image	
DAT2012_PAGE02_V2	GRAPHICS	BMAP	Color Bitmap Image	
DAT2016_PAGE01	GRAPHICS	BMAP	Color Bitmap Image	
DATA	GRAPHICS	BMAP	Color Bitmap Image	BANKING
DPR_CHECKLIST.BMP	GRAPHICS	BMAP	Color Bitmap Image	
DPR_HEADER.BMP	GRAPHICS	BMAP	Color Bitmap Image	

151 Entries found

Graphic: %GRAPHIC1  
 Description: New Graphic 1

General Attributes | Output Options | Conditions

Position and Size

Left Margin	13,24	CM	Width	5,26	CM
Top Margin	1,20	CM	Height	0,96	CM

Box and Shading

Frames

Lines With

Spacing: 0,00 CM

Color: [Black]

Width: 0,00 PT

Preview

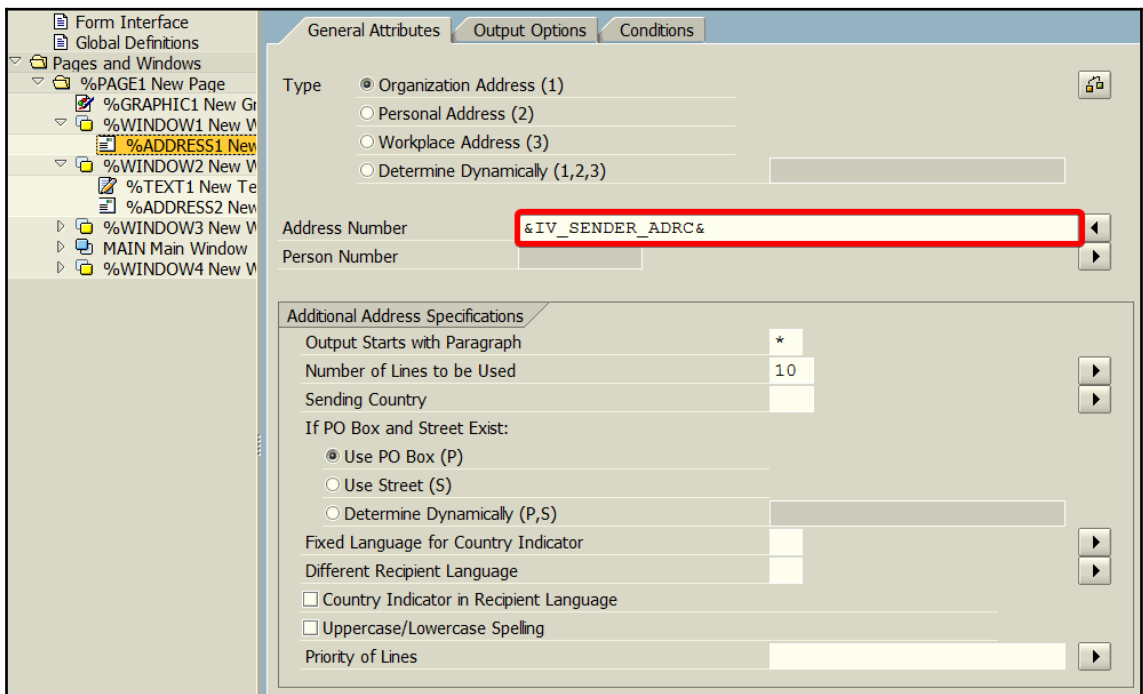
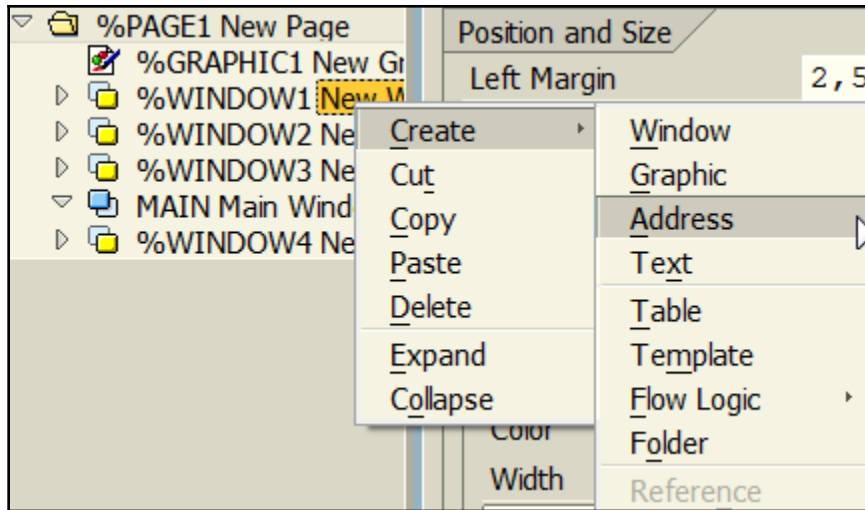
**SAP Form Builder: Change Form ZMSA\_05\_SMARTFORM**

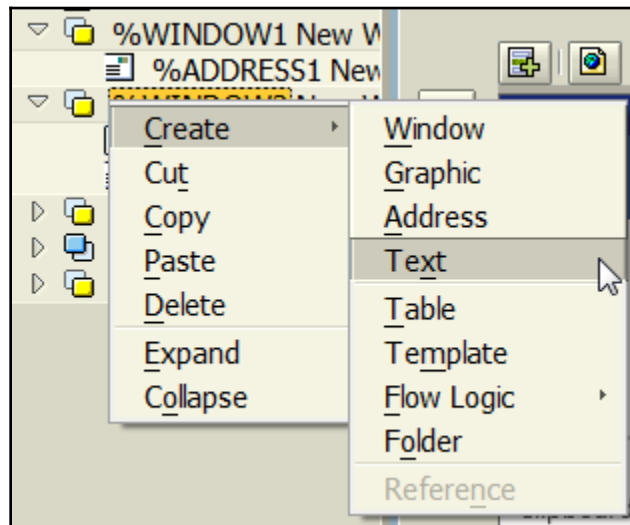
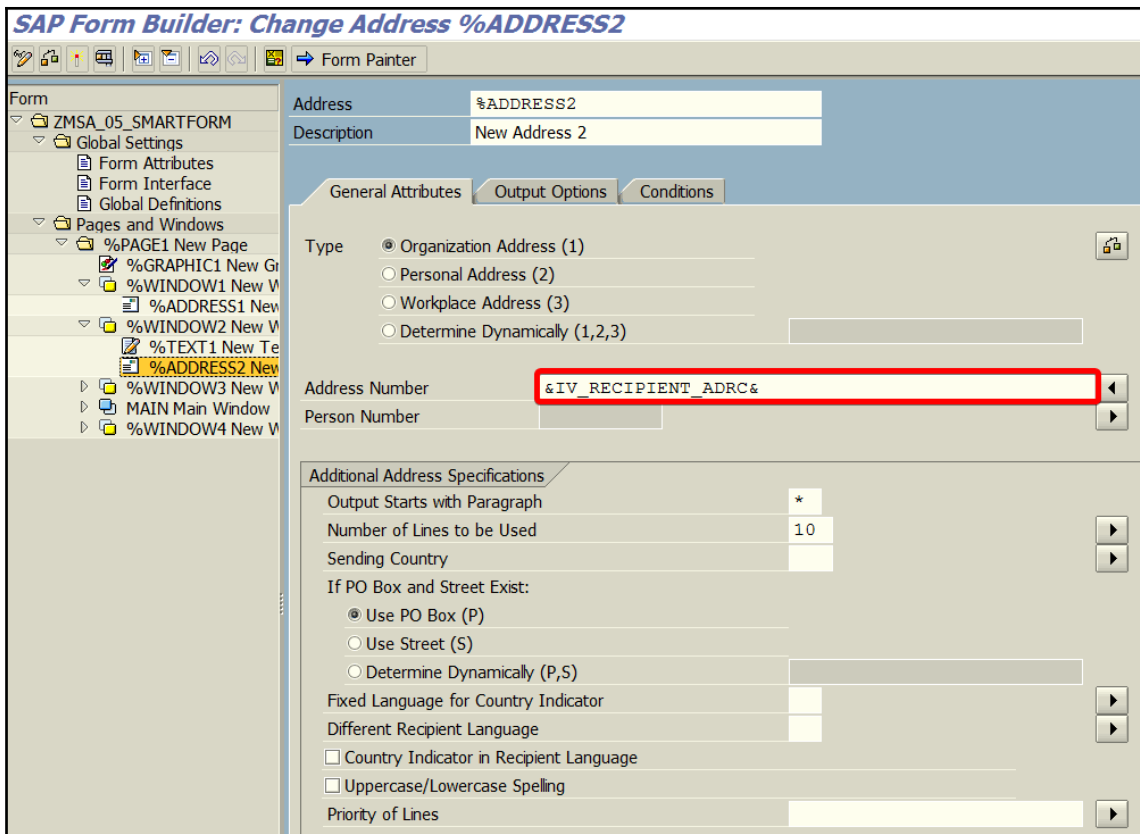
Form Painter

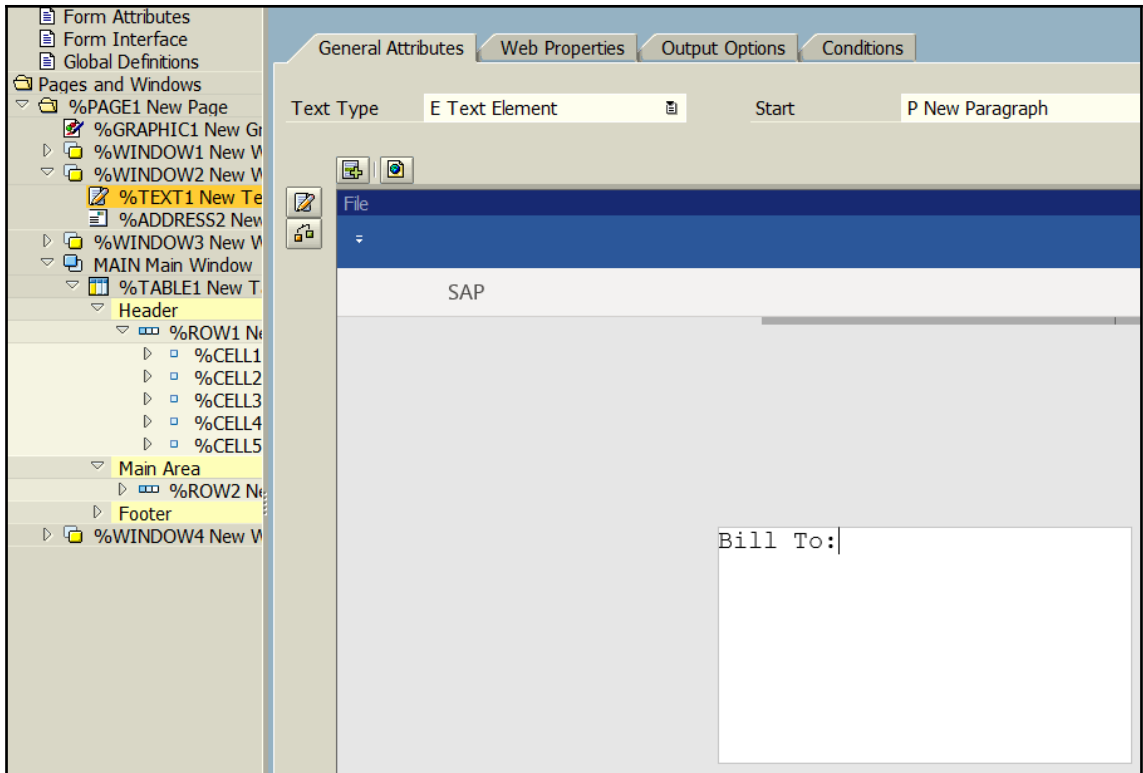
Form: ZMSA\_05\_SMARTFORM Active  
 Description: My first smartform

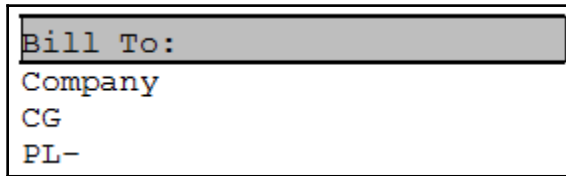
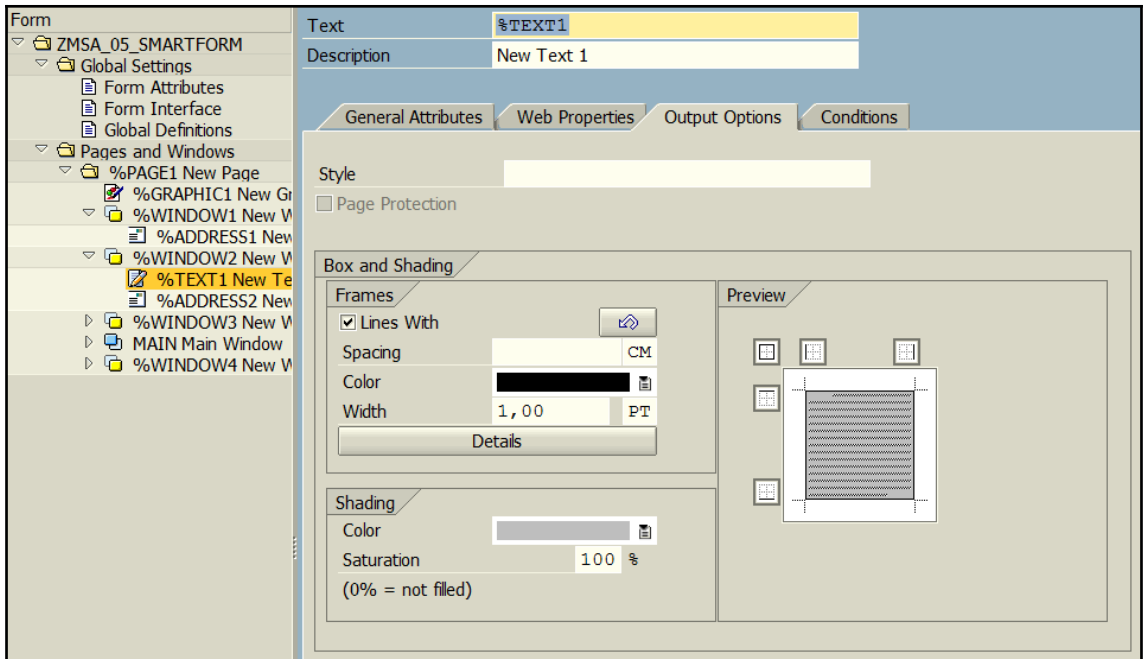
Import | Export | Tables | Exceptions

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	SWOTOBJID	
MAIL_RECIPIENT	TYPE	SWOTOBJID	
MAIL_SENDER	TYPE	SWOTOBJID	
OUTPUT_OPTIONS	TYPE	SSFCOMPOP	
USER_SETTINGS	TYPE	TDBOOL	X
IS_VBAK	TYPE	VBAK	
IT_VBAP	TYPE	VBAP_TTY	
IV_SENDER_ADRC	TYPE	AD_ADDRNUM	
IV_RECIPIENT_ADRC	TYPE	AD_ADDRNUM	











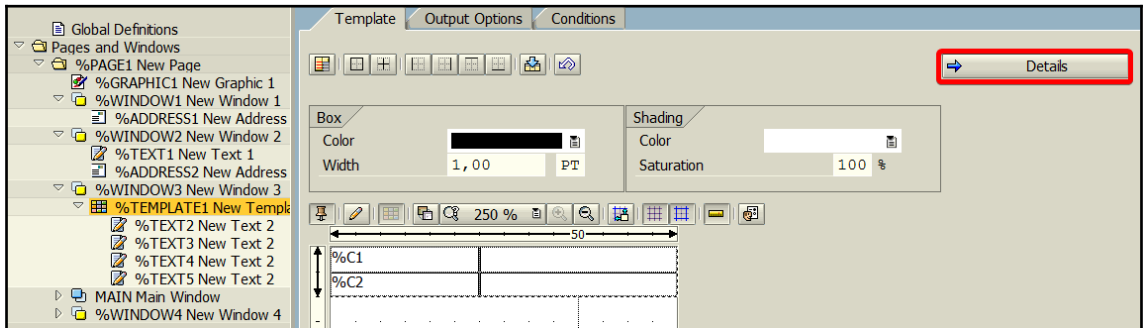
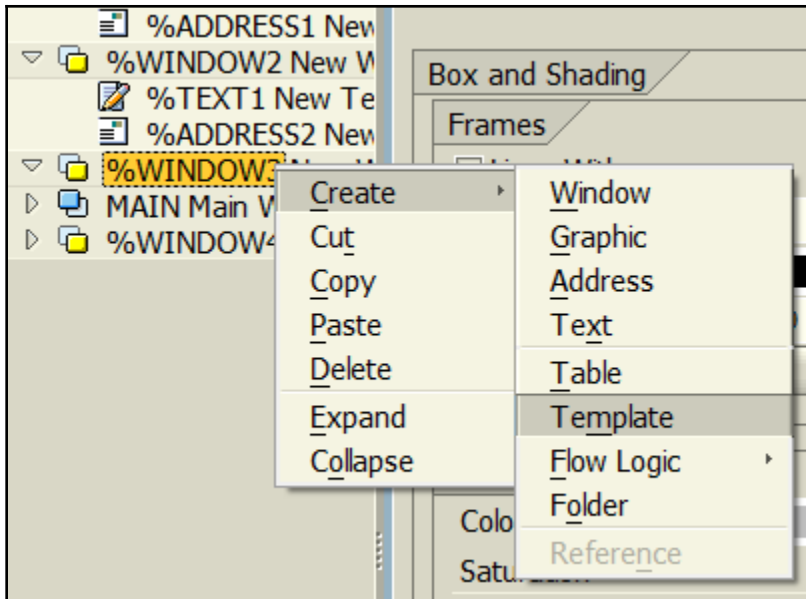


Table Painter

Width: 7,00 CM

Horizontal Alignment: Centered

Vertical Alignment: C Currently

Name	From	To	Reference	Height	U. 1.	U. 2.	U. 3.	U. 4.	U. 5.
%C1	1	1		5,00	MM	3,00	CM	4,00	CM
%C2	2	2		5,00	MM	3,00	CM	4,00	CM

### SAP Form Builder: Change Text %TEXT2

Form Painter

Form: ZMSA\_05\_SMARTFORM

Text: %TEXT2

Description: New Text 2

General Attributes | Web Properties | Output Options | Conditions

Style:

Page Protection

Box and Shading

Frames

Lines With

Spacing: 0,00 CM

Color:

Width: 0,00 PT

Details

Shading

Color:

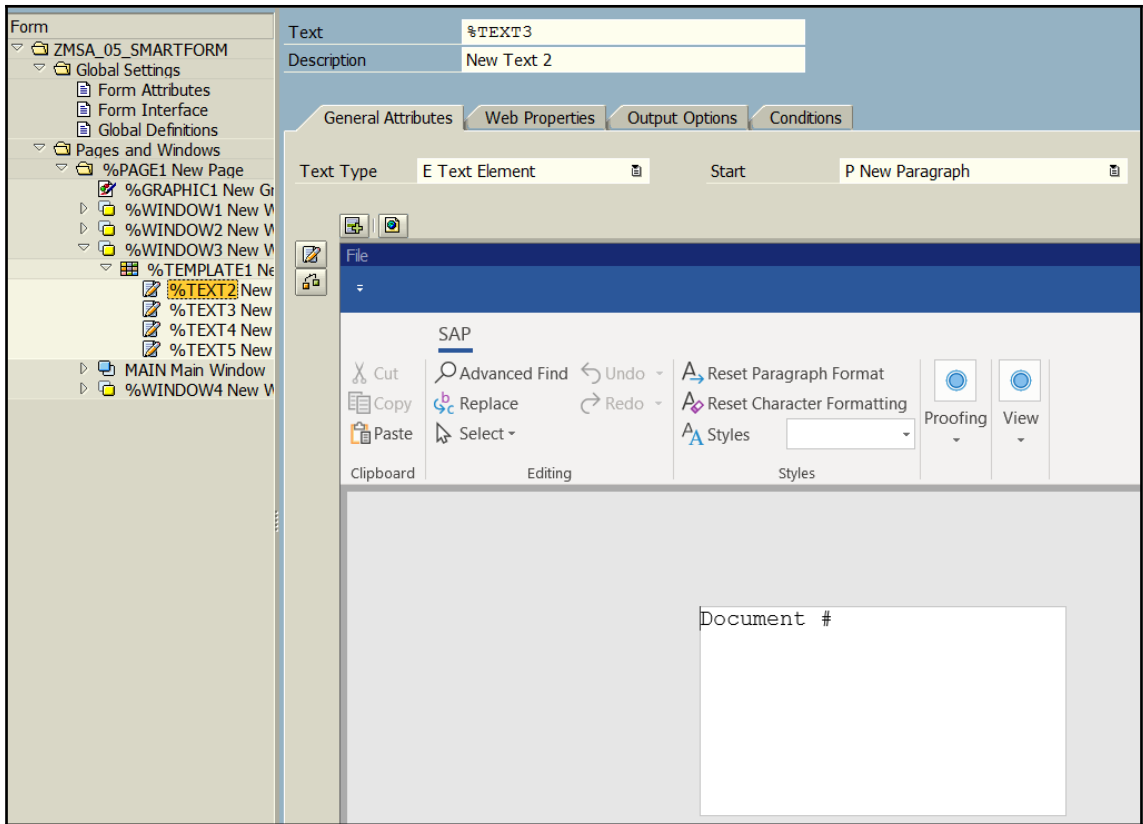
Saturation:  %

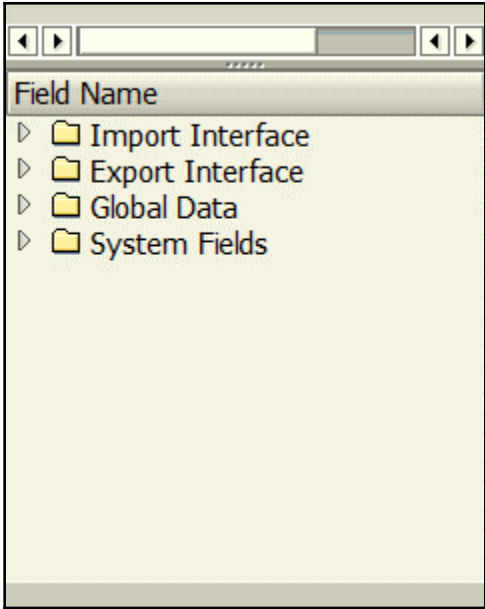
(0% = not filled)

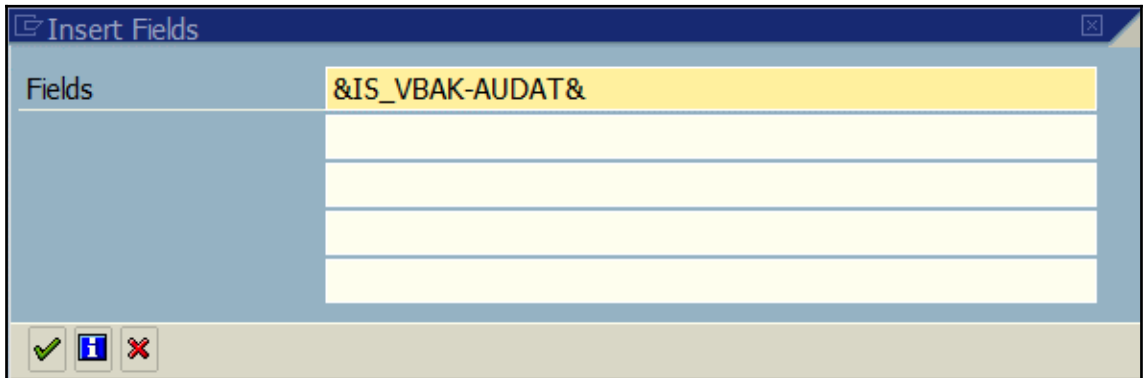
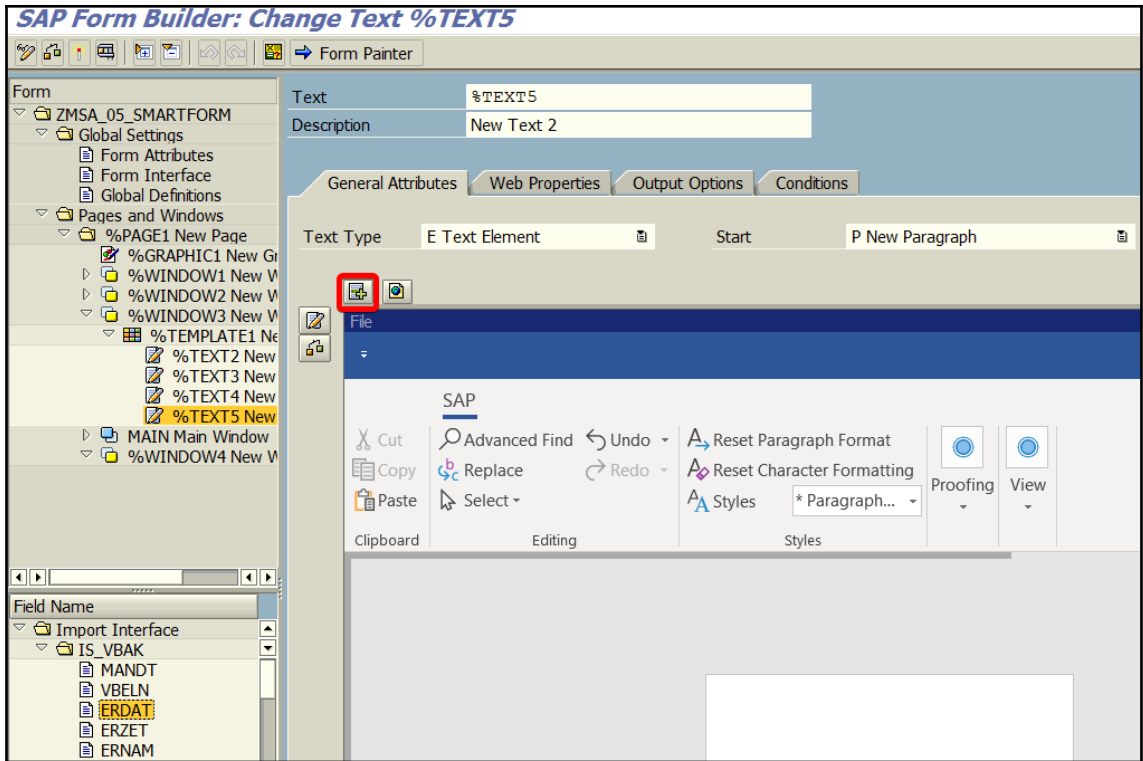
Preview

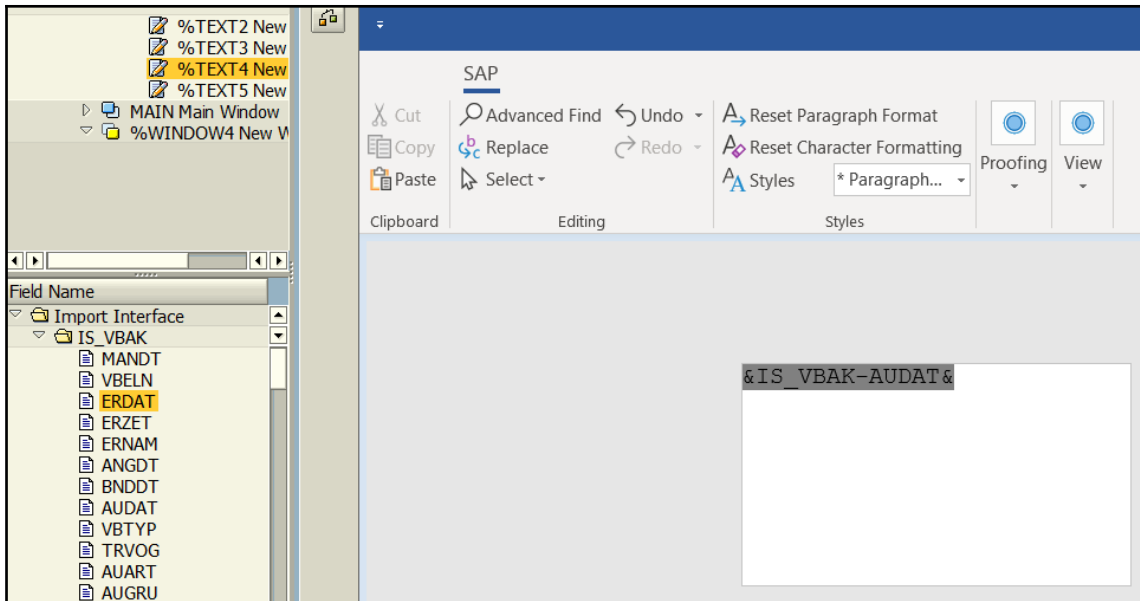
Output structure

Line	1
Column	1

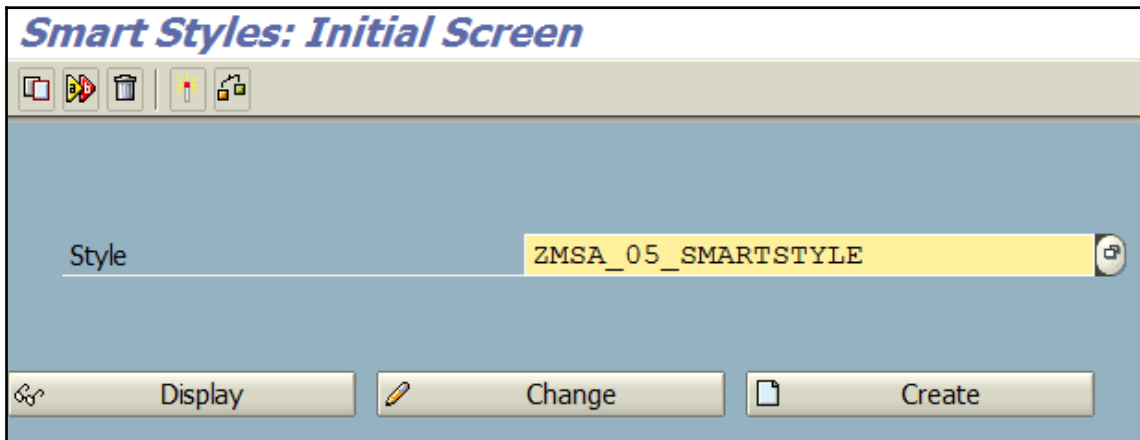


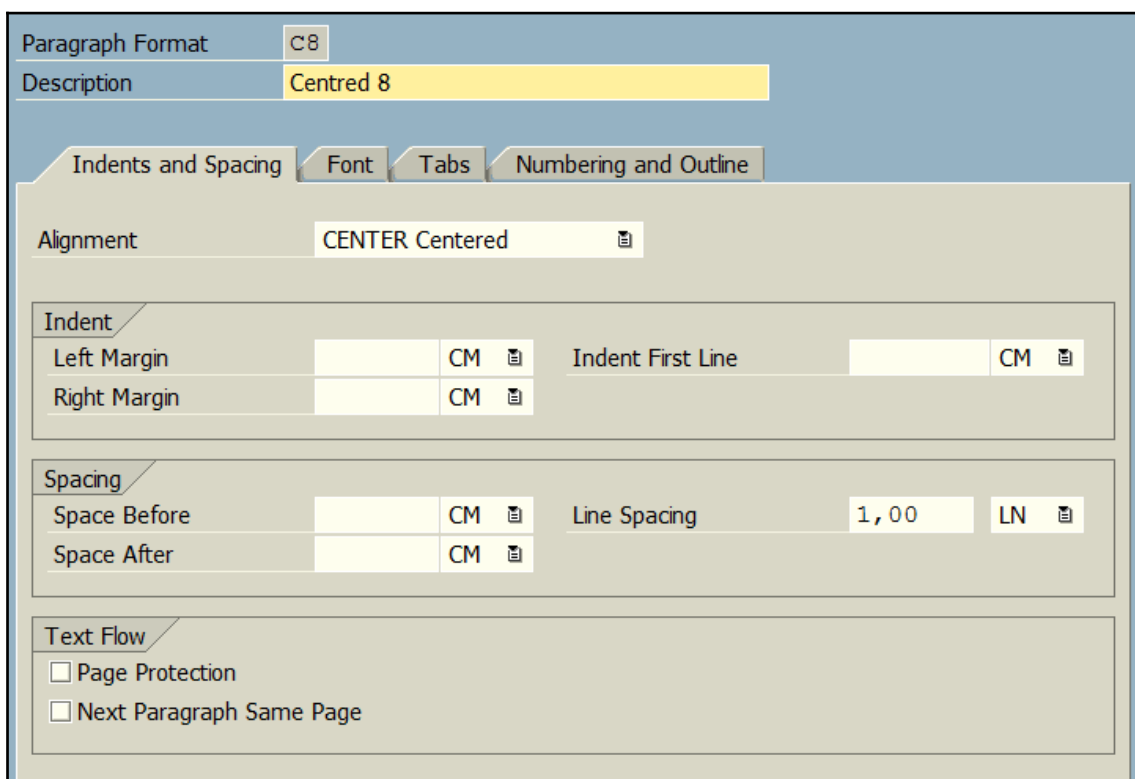
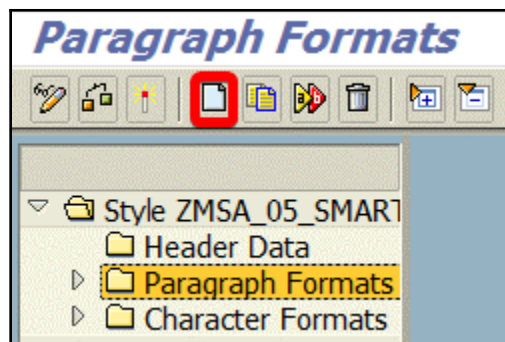


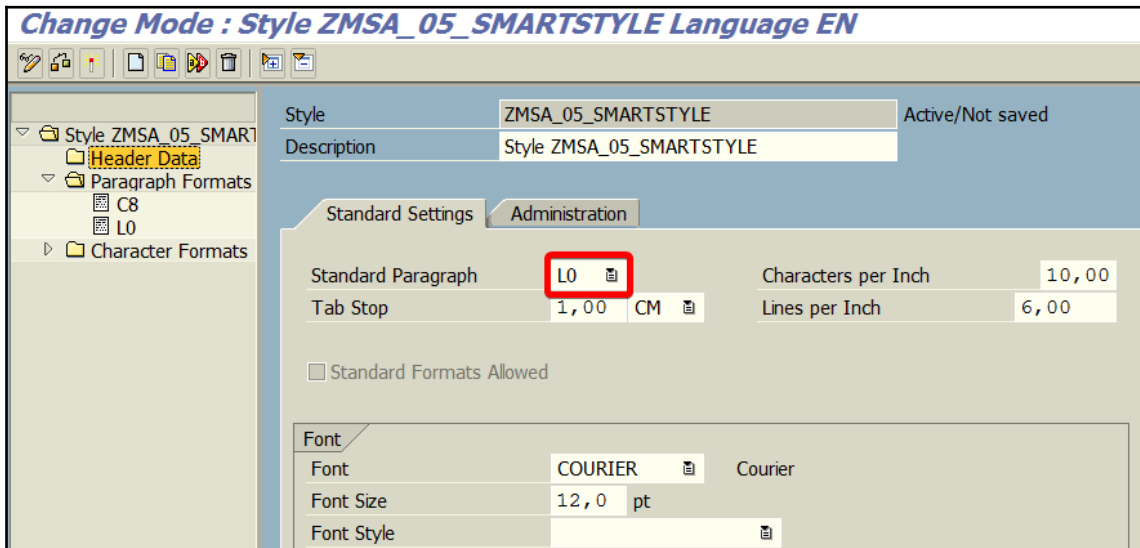
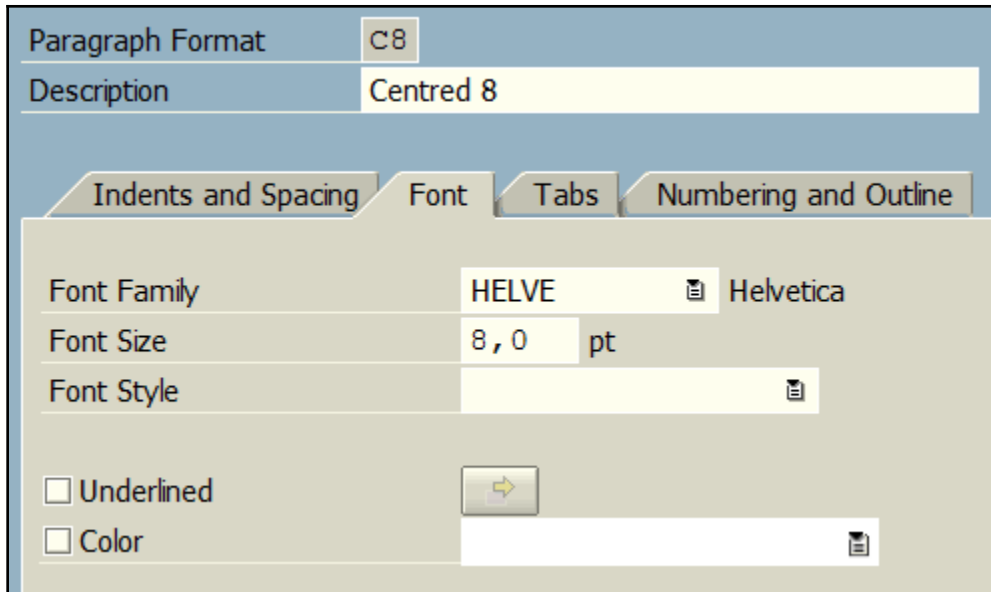




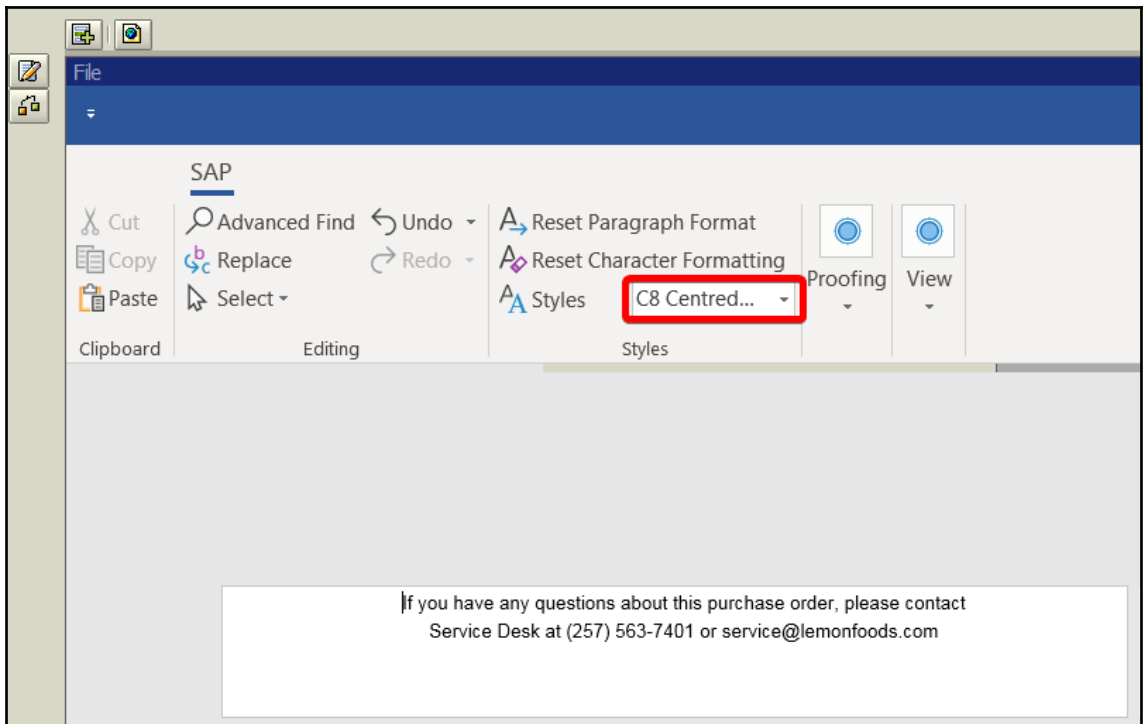
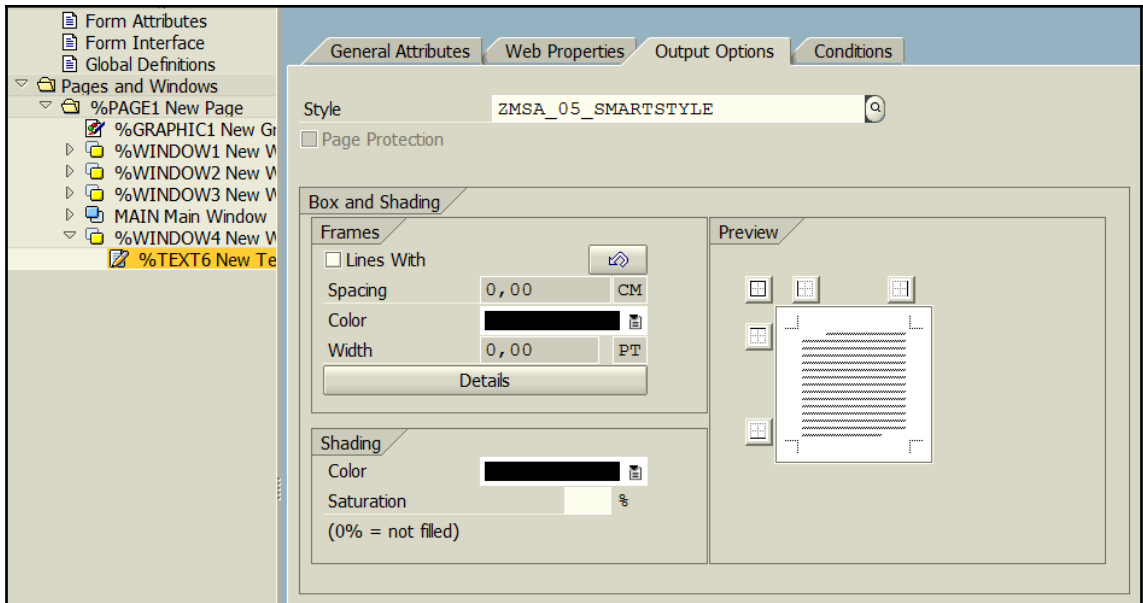
If you have any questions about this purchase order, please contact  
Service Desk at (257) 563-7401 or [service@lemonfoods.com](mailto:service@lemonfoods.com)











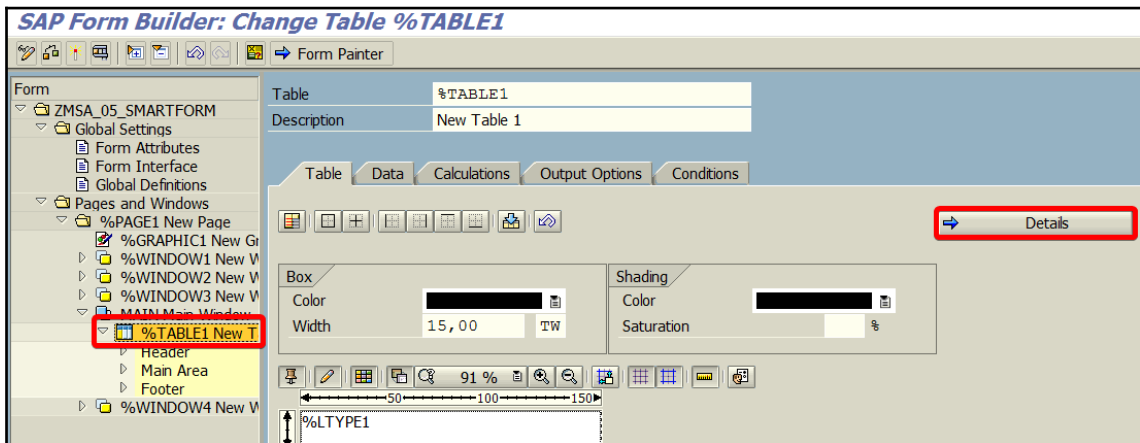
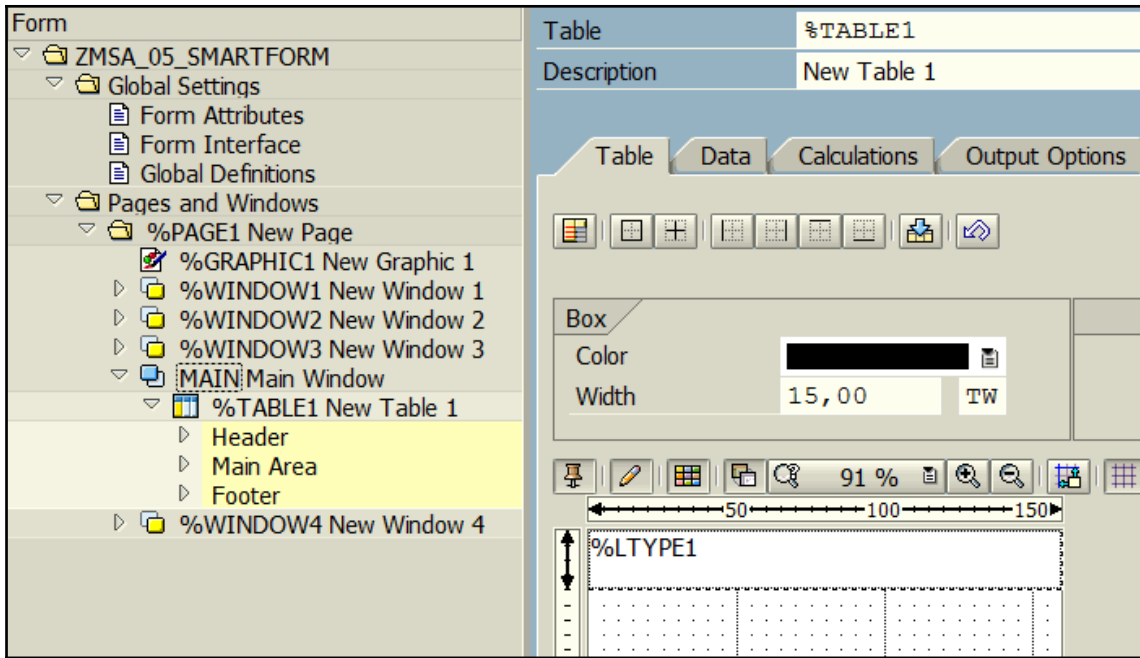
The screenshot shows the SAP SmartForm editor interface. On the left is a tree view with 'Global Definitions' selected. The main area displays a table with the following data:

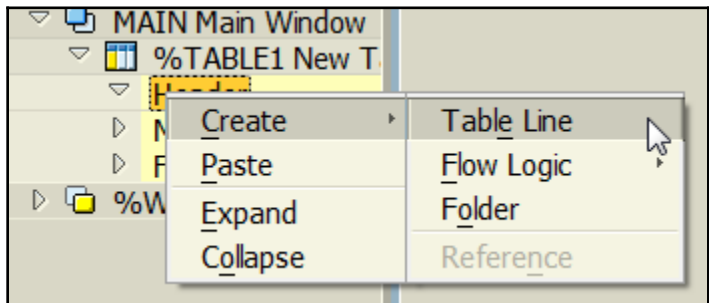
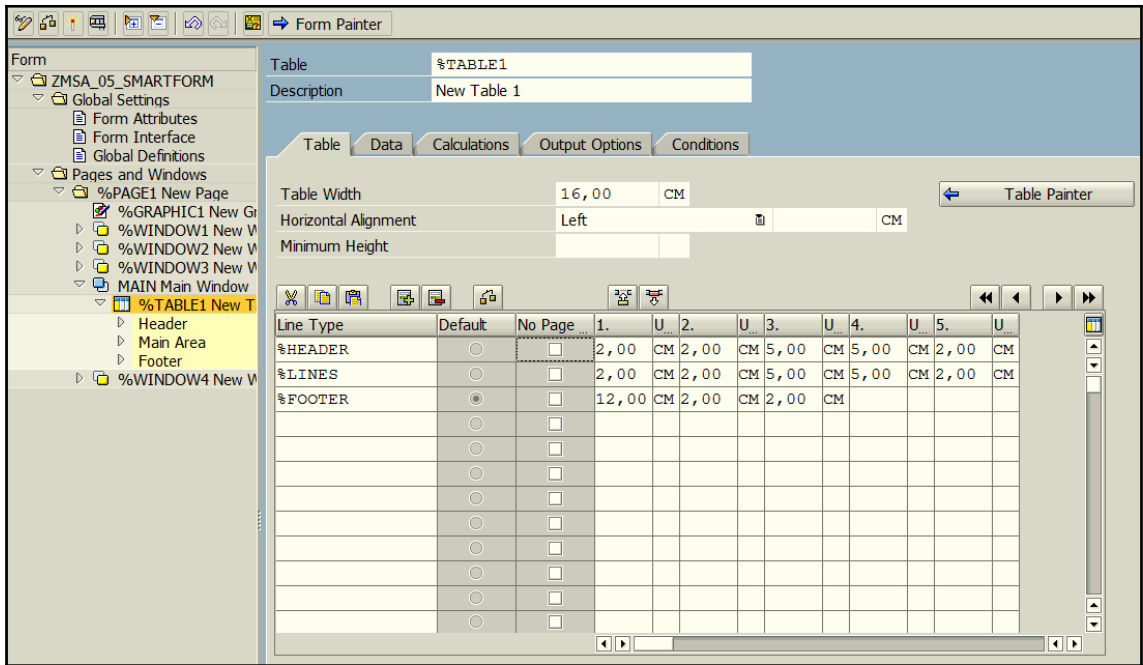
Variable Name	Typing	Associated Type
GS_VBAP	TYPE	VBAP
GV_SUM	TYPE	NETWR_AP
GV_TOTAL	TYPE	NETWR_AP

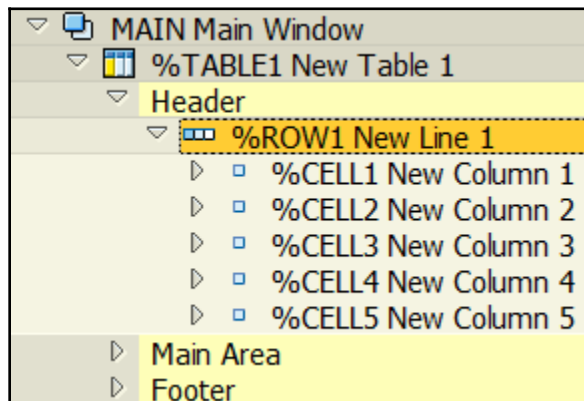
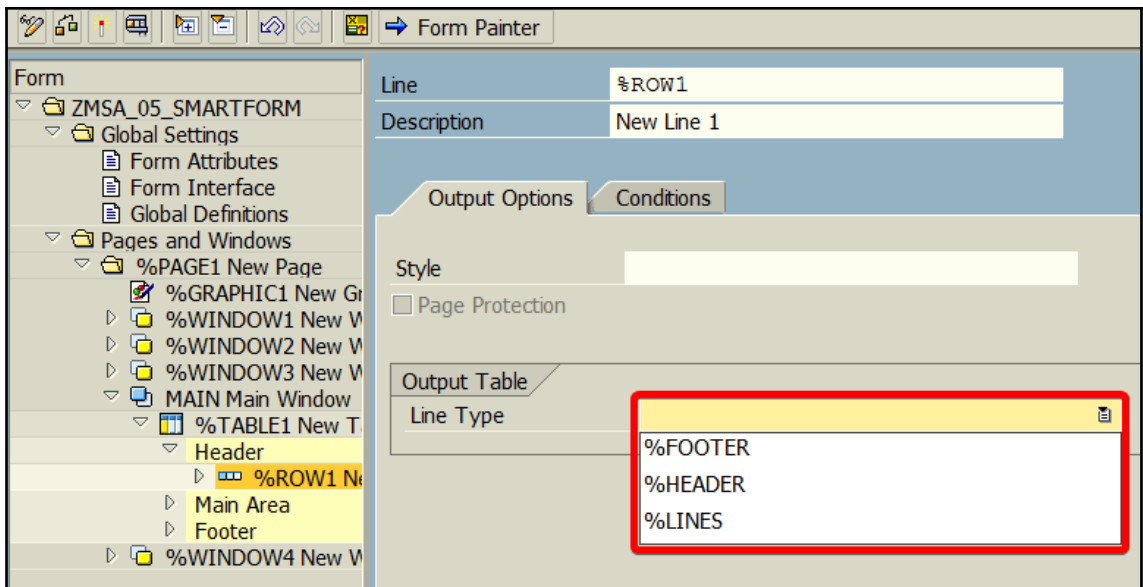
The screenshot shows a context menu with the following items:

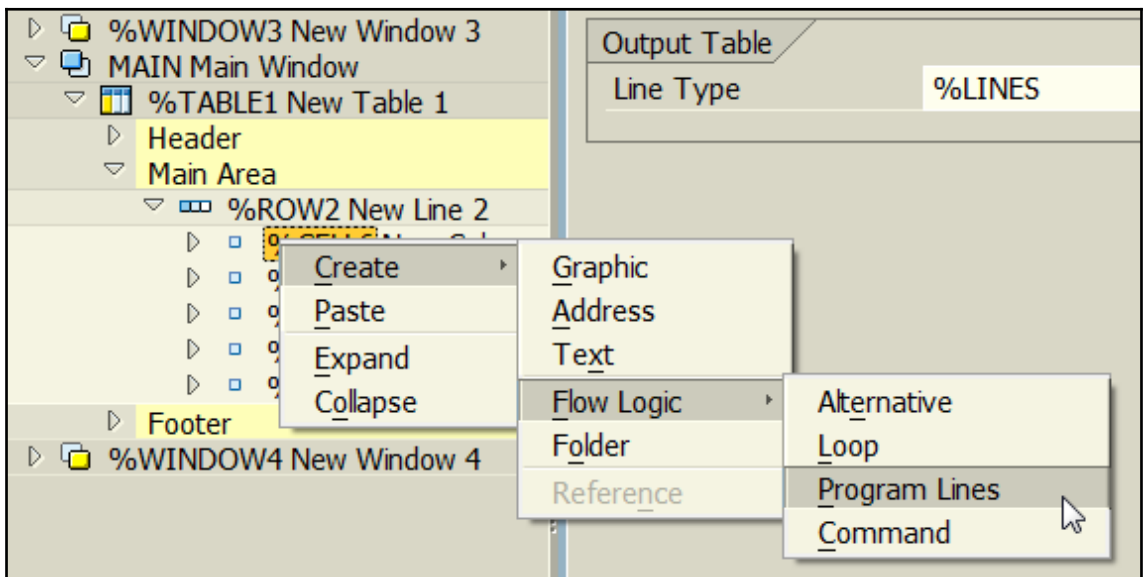
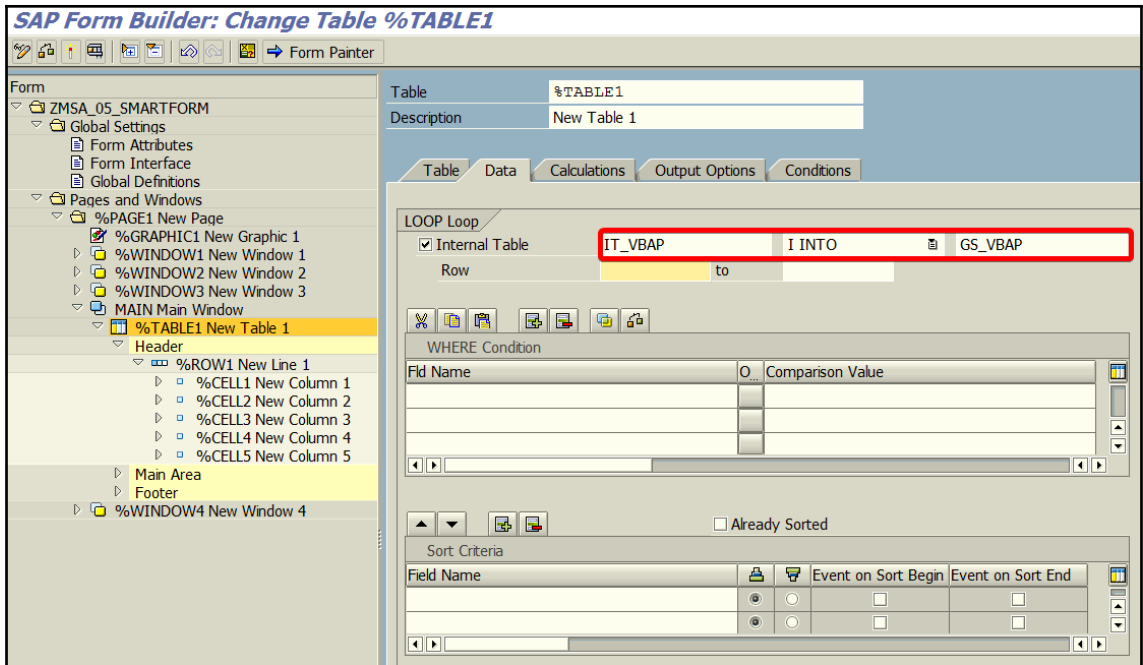
- Create
- Cut
- Copy
- Paste
- Delete
- Expand
- Collapse
- Window
- Graphic
- Address
- Text
- Table
- Template
- Flow Logic
- Folder
- Reference

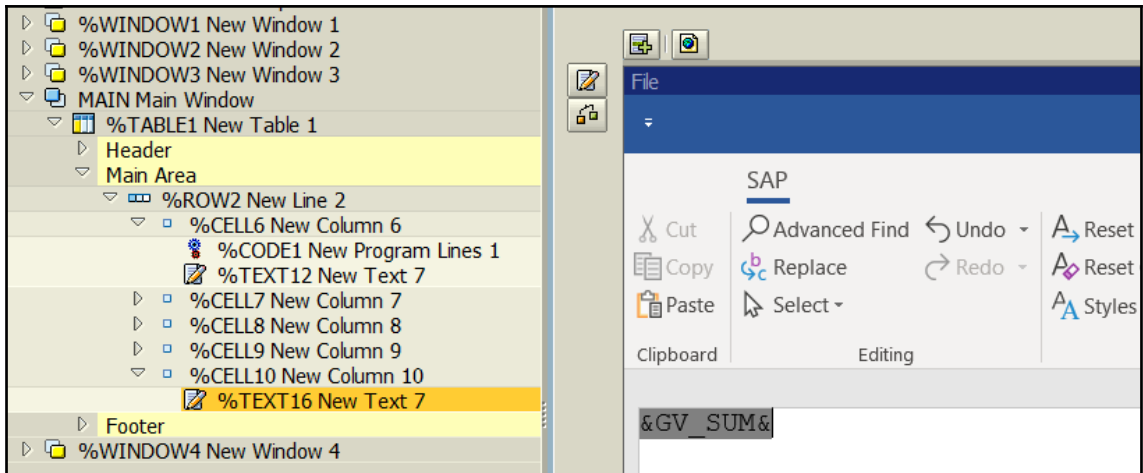
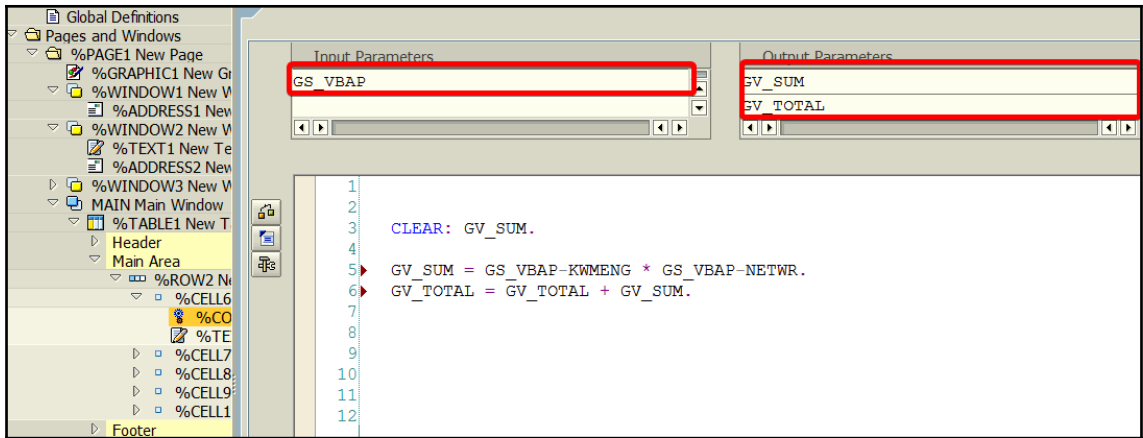
The 'Table' option is highlighted by the mouse cursor.











Company  
CG  
PL-

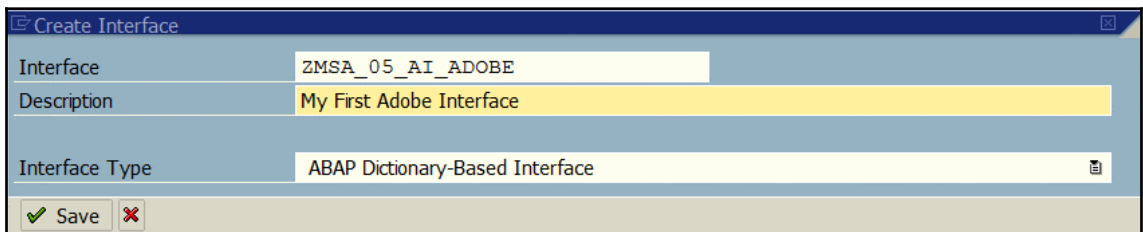
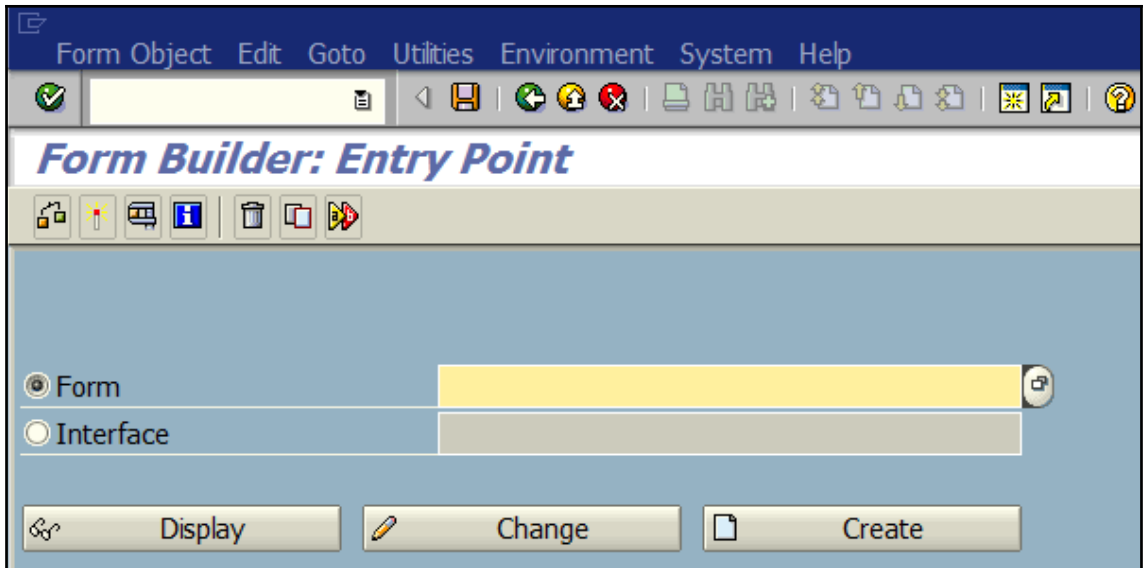


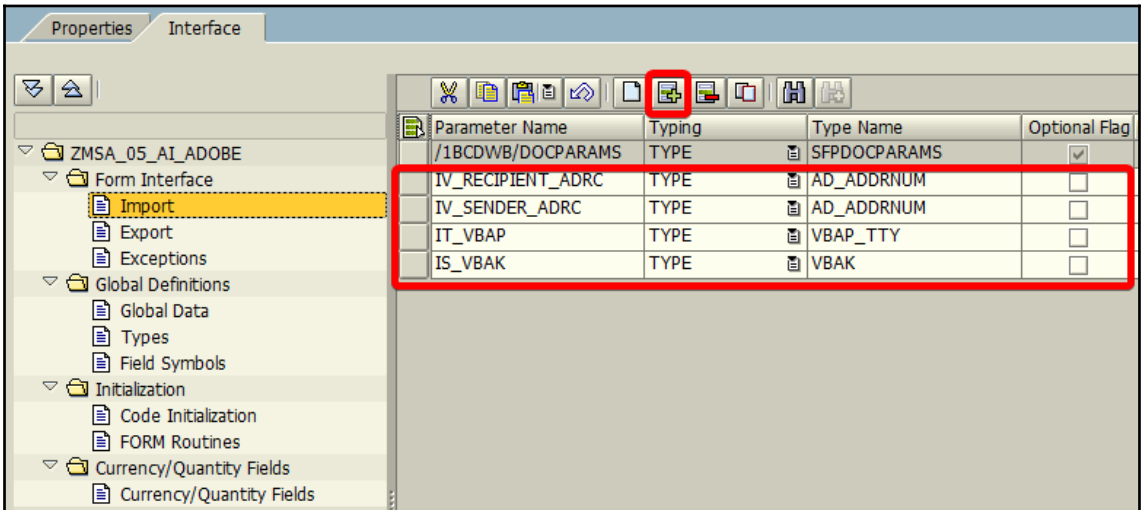
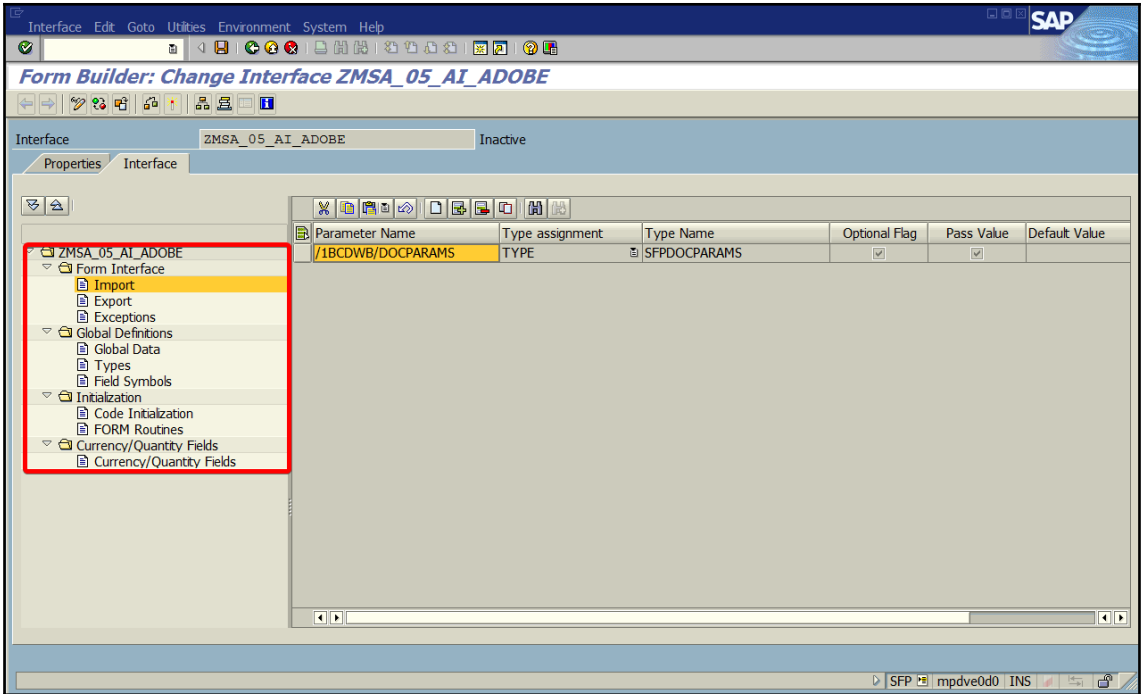
Bill To:  
Company  
CG  
PL-

Doc. Date	Document #
01.01.2018	100001

Mat. #	Description	Qty.	Unit Price	Total
101	Test1	10,000	13,50	135,00
102	Test2	5,000	25,00	125,00
103	Test3	2,000	100,00	200,00
			Total	460,00







Form  Interface

ZMSA\_05\_AF\_ADOBE

ZMSA\_05\_AI\_ADOBE

Display Change Create

Create Form

Form ZMSA\_05\_AF\_ADOBE

Description My First Adobe Form

Interface ZMSA\_05\_AI\_ADOBE

Save

Form ZMSA\_05\_AF\_ADOBE Active

Properties Context Layout

Interface	Description	Context	Inac	Gen	Description
ZMSA_05_AI_ADOBE		ZMSA_05_AF_ADOBE			
IV_RECIPIENT_ADRC	Address Number				
IV_SENDER_ADRC	Address Number				
IT_VBAP	Table Type for Structure VBAP				
IS_VBAK	Sales Document: Header Data				

Context

Inac	Gen	Description
		Structure VBAP

Create

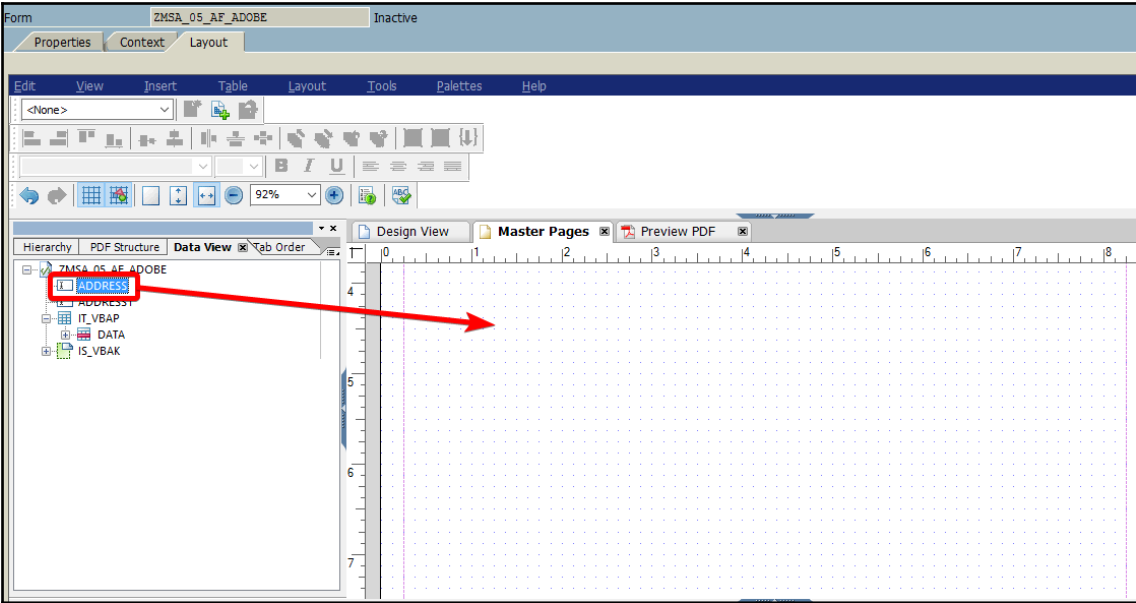
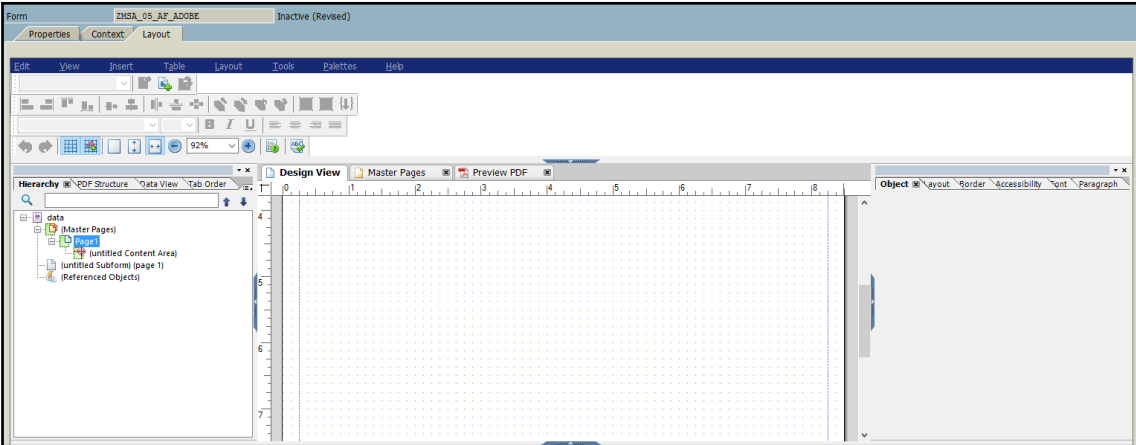
- Graphic
- Address
- Text
- Alternative
- Folder
- Data...
- Structure...
- Loop...
- Single Record...

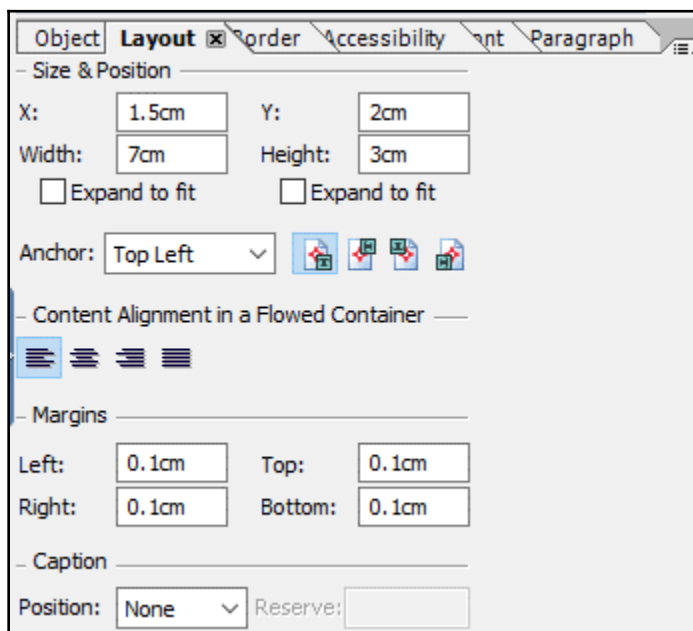
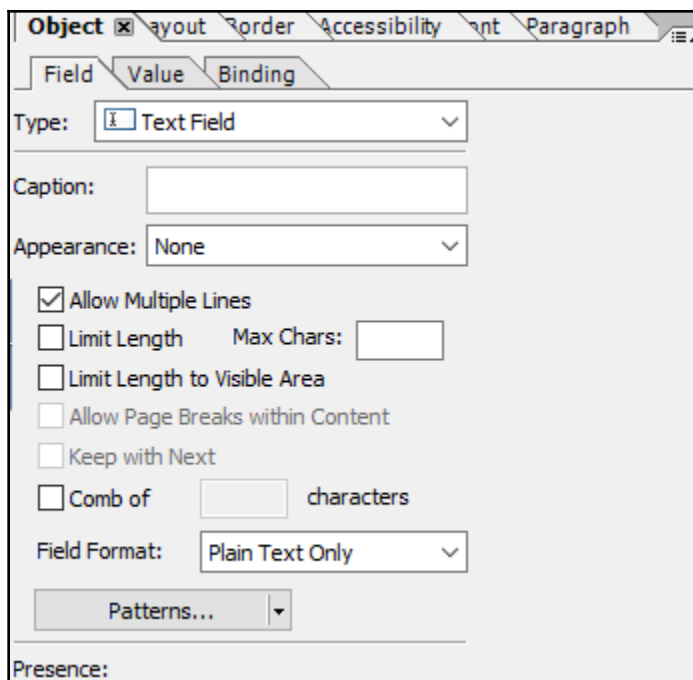
The screenshot shows the SAP GUI configuration for a table type for structure VBAP. The 'Context' table lists nodes: ADDRESS, ADDRESS1, IT\_VBAP, IS\_VBAK, and GRAPHIC. The 'Properties' table shows the following configuration:

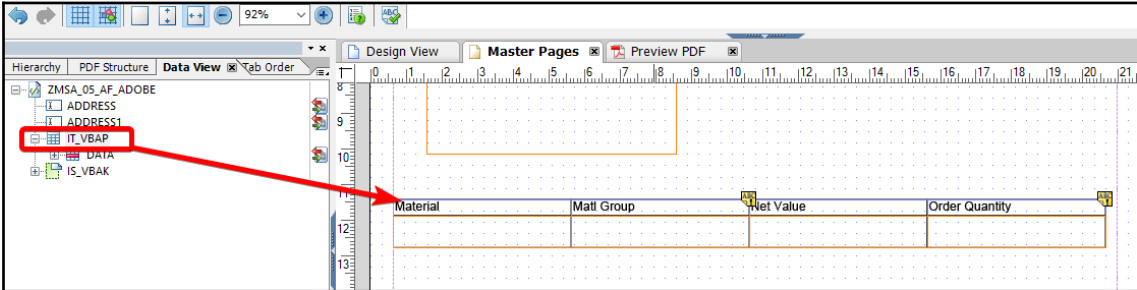
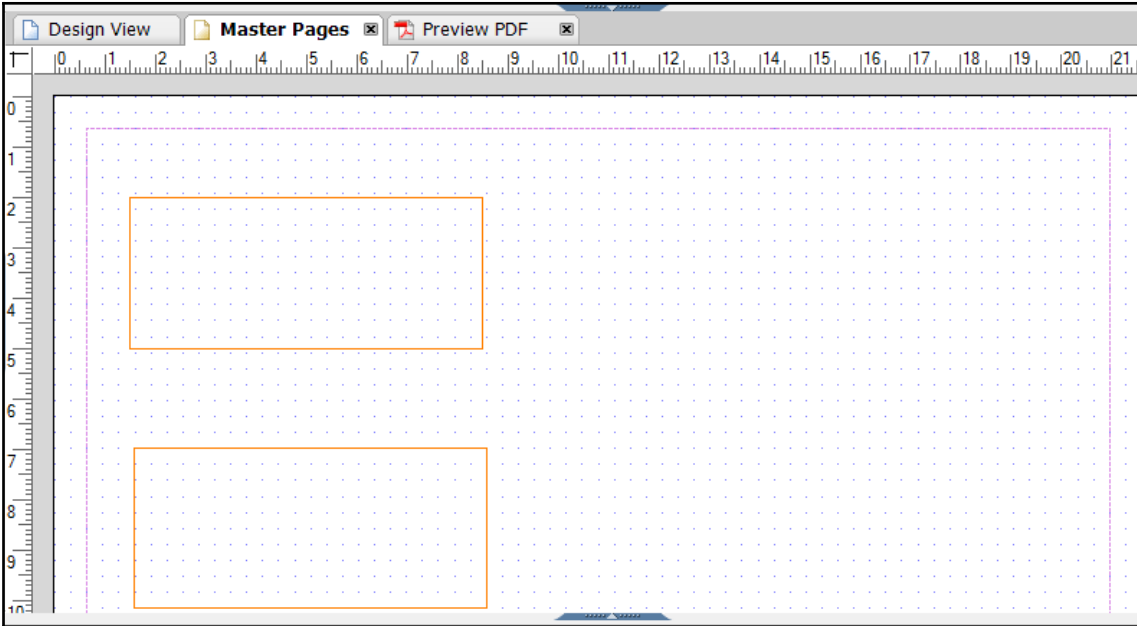
Property	Value
Status	Active
Address	
Address Type	Organization, Company
Dynamic Address Type	
Address Number	IV_SENDER_ADRC
Person Number	
Handle for Address Number	

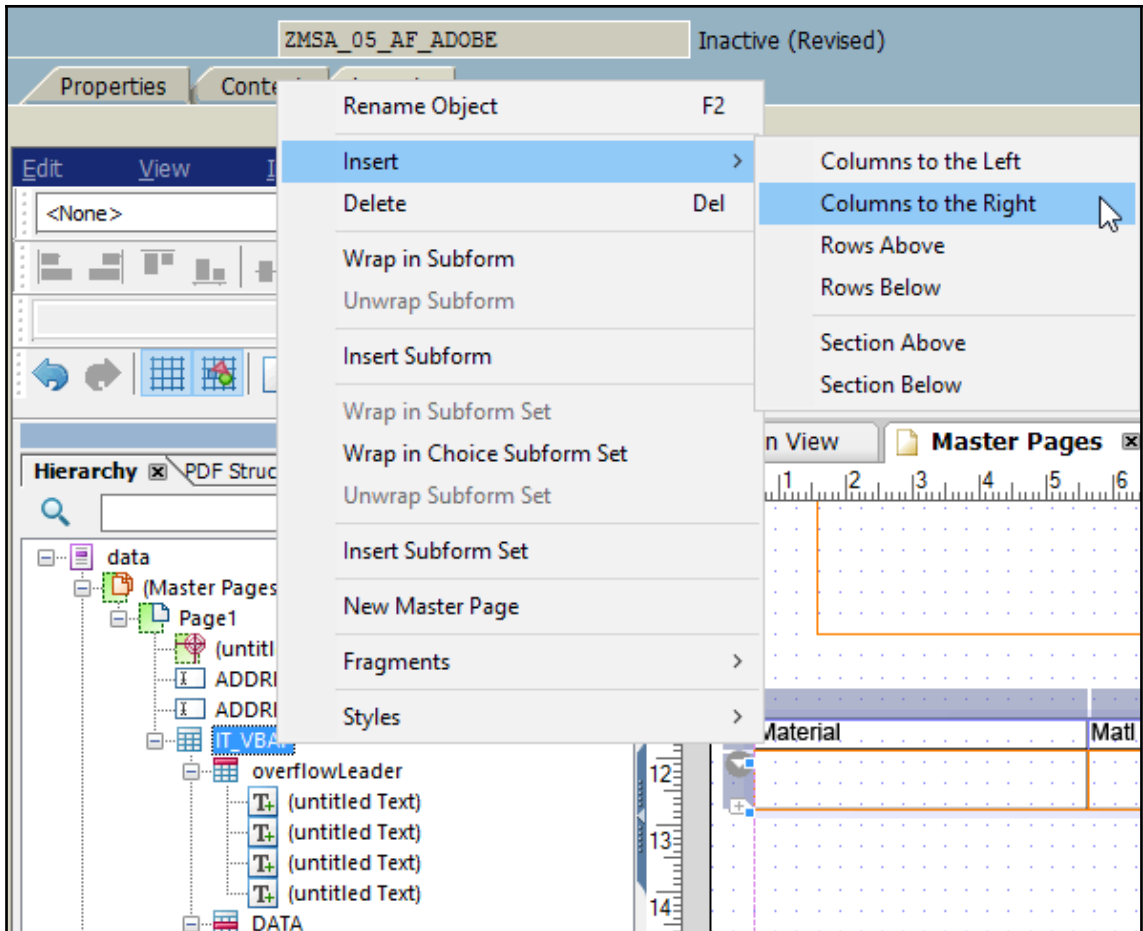
The screenshot shows the 'DATA' section of the 'IT\_VBAP' table type configuration. The 'MATNR' field is highlighted, and a context menu is open with the following options:

- Set to Active
- Deactivate

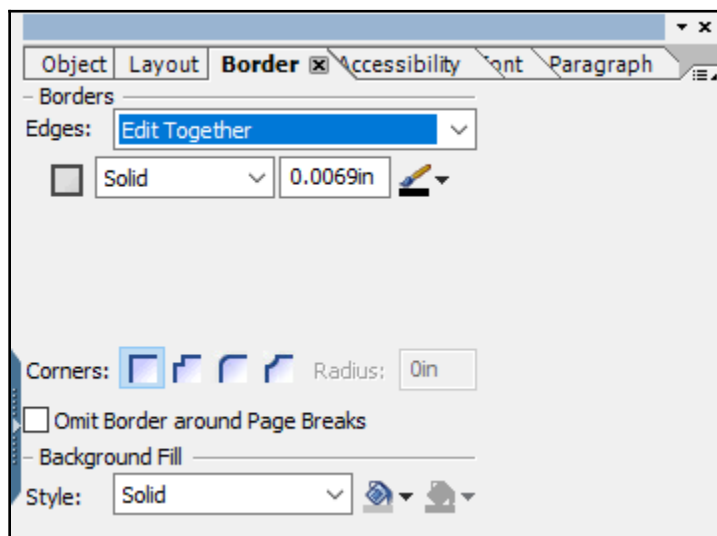
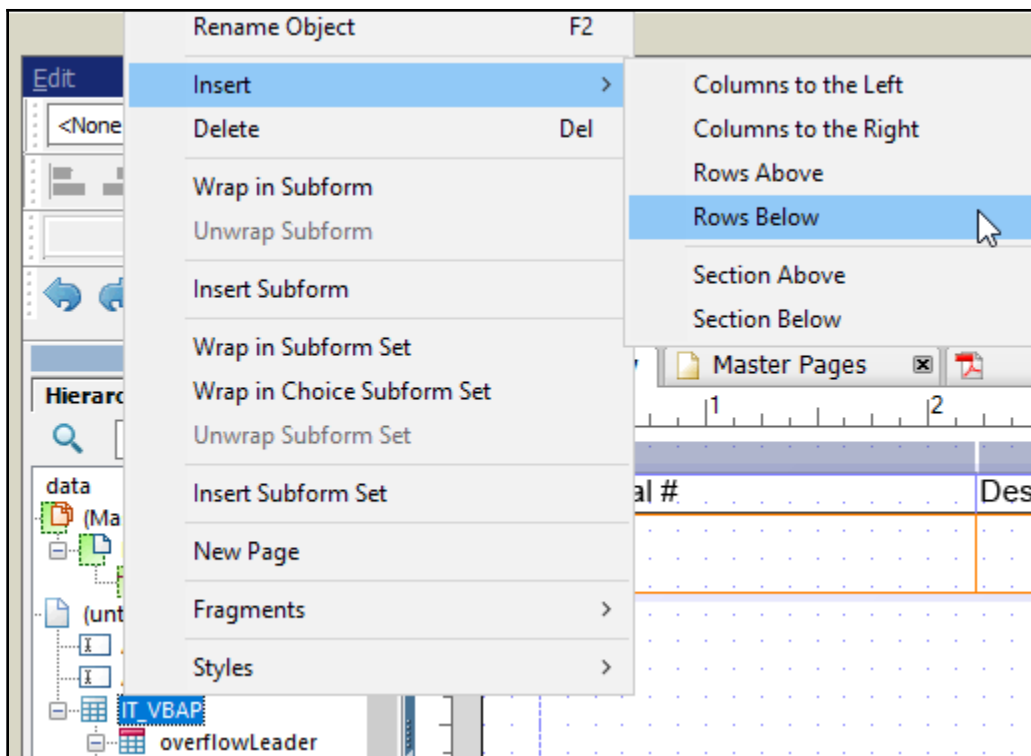


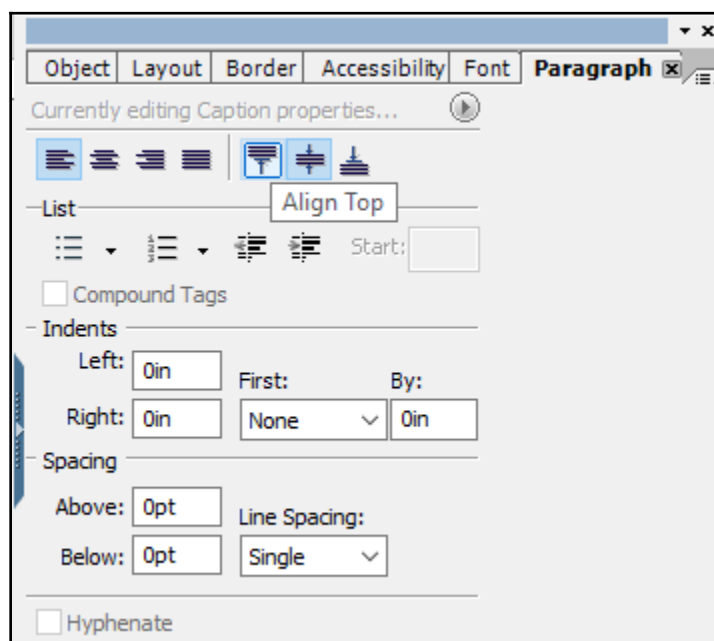
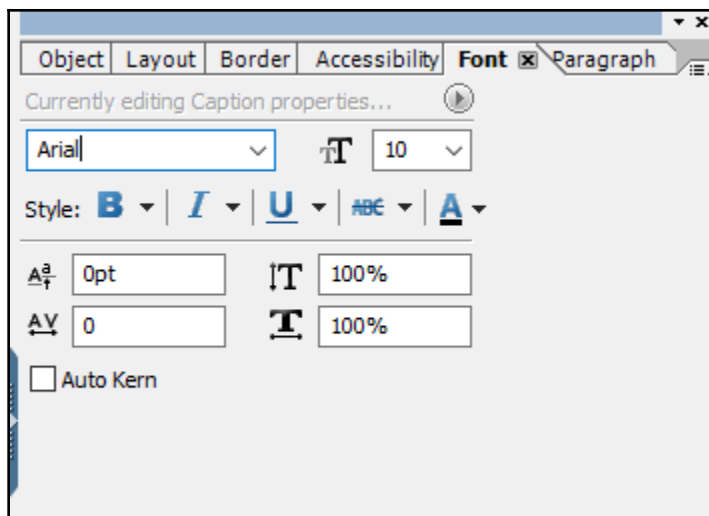


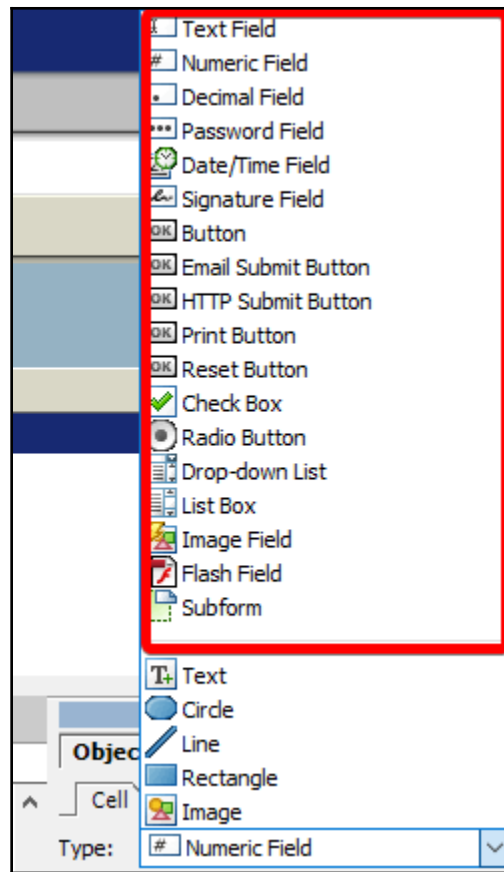


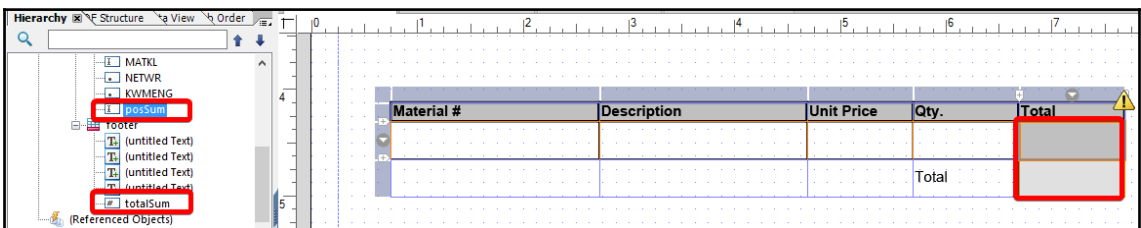
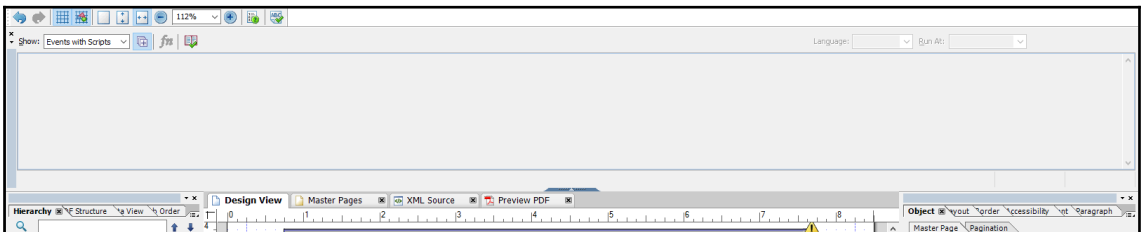
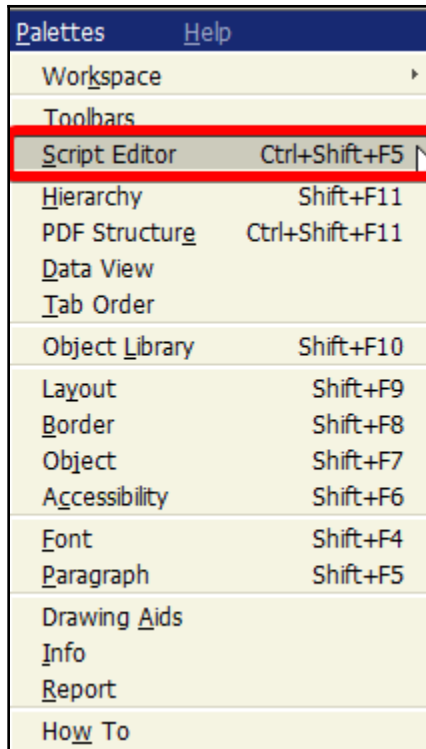


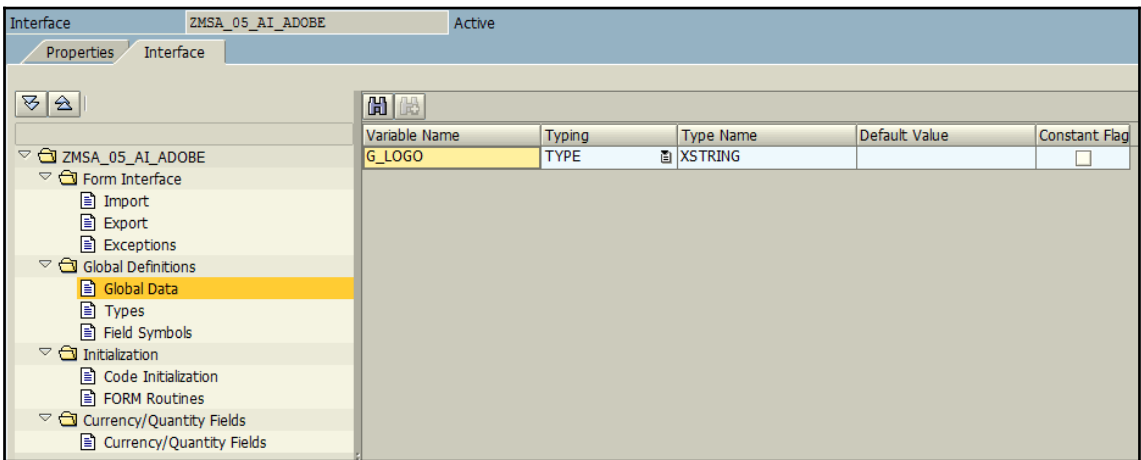
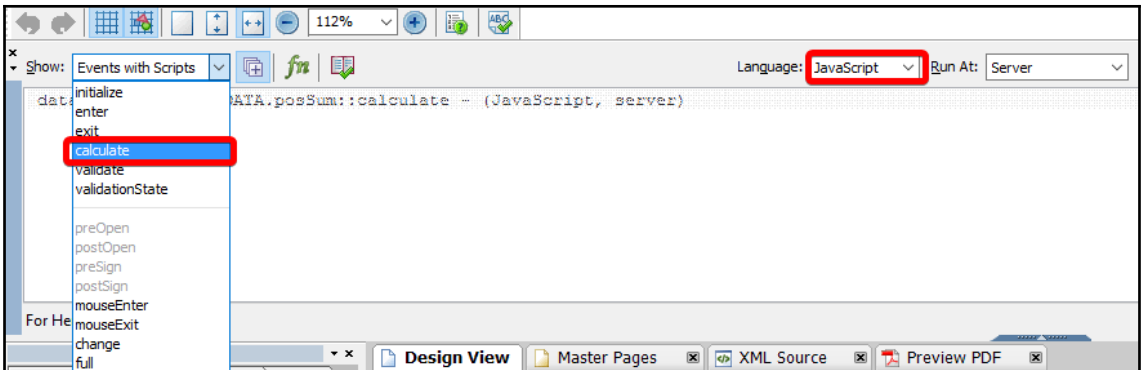


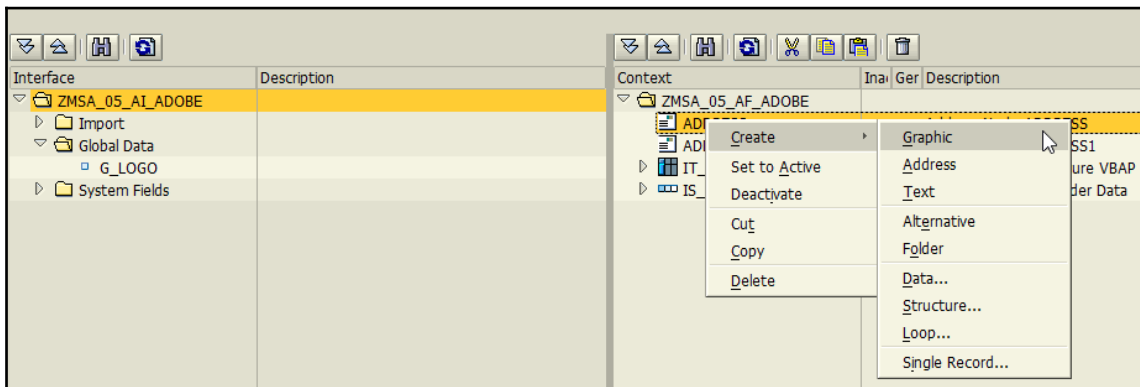
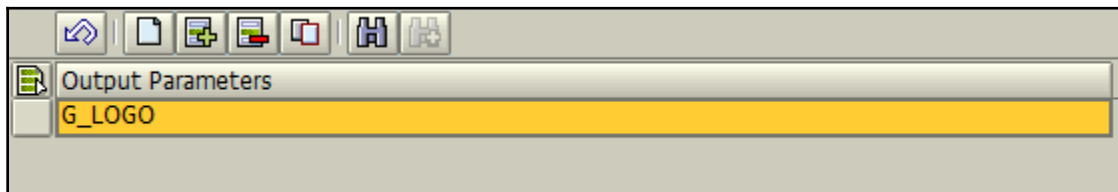
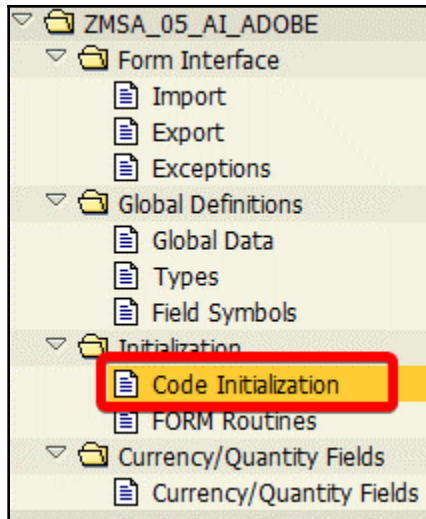










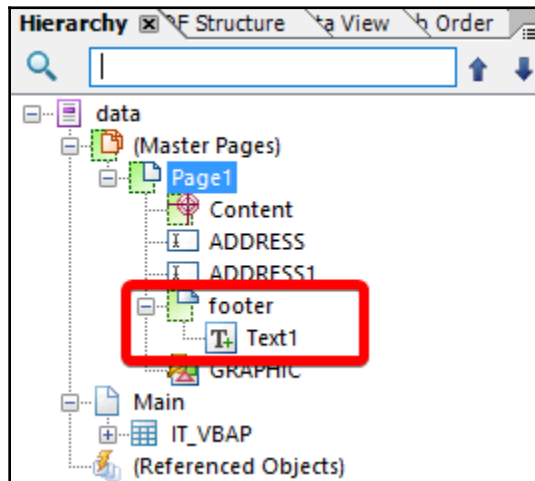
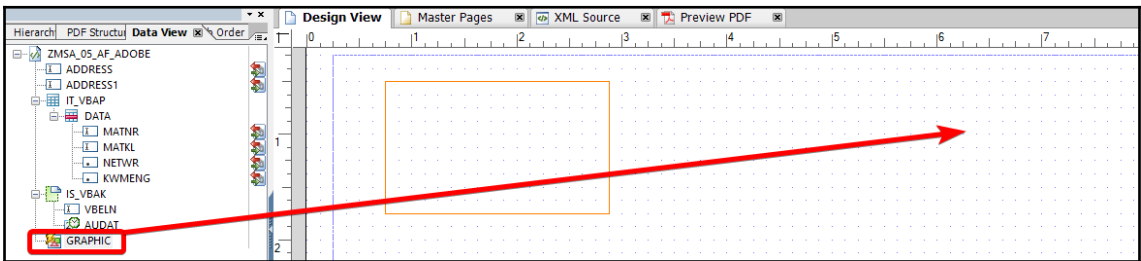


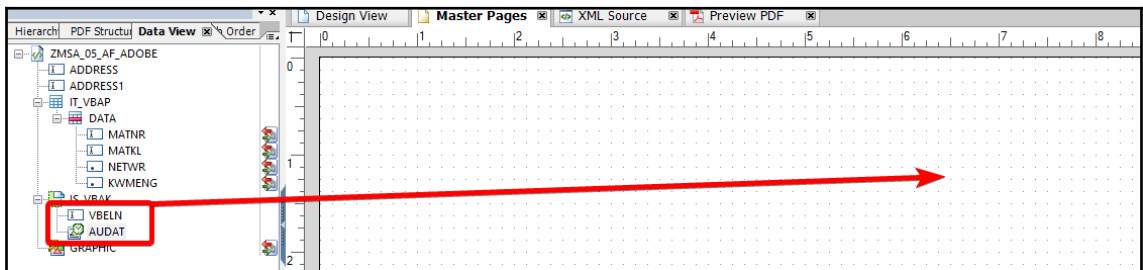
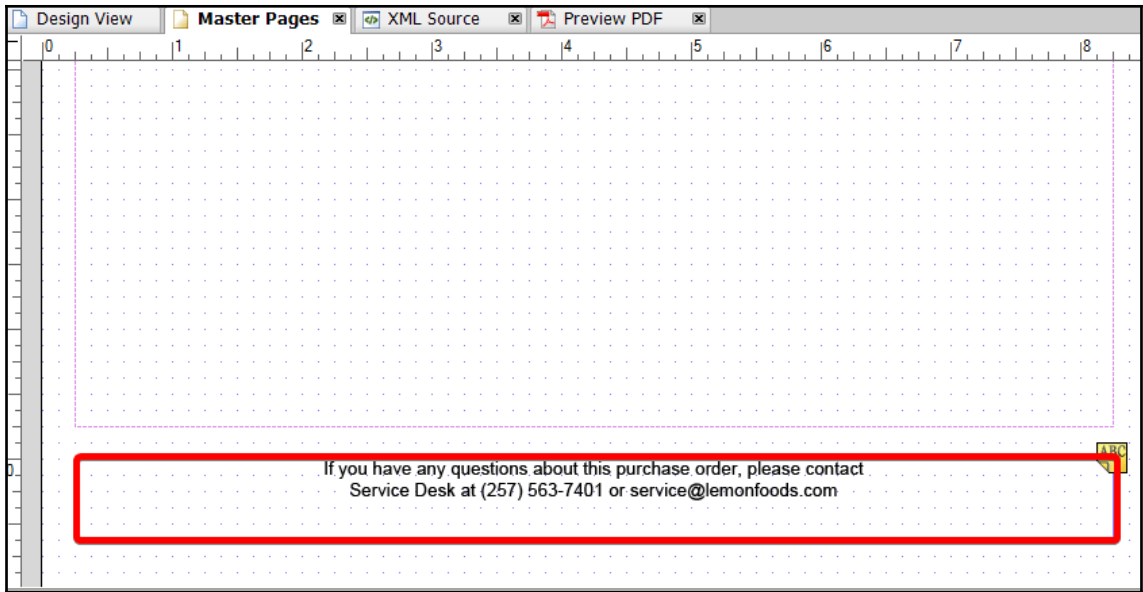
# Graphic Bundle

Context	Ina	Ger	Description
▼ ZMSA_05_AF_ADOBE			
ADDRESS			Address Node ADDRESS
ADDRESS1			Address Node ADDRESS1
IT_VBAP			Table Type for Structure VBAP
IS_VBAK			Sales Document: Header Data
GRAPHIC			Graphic Node GRAPHIC

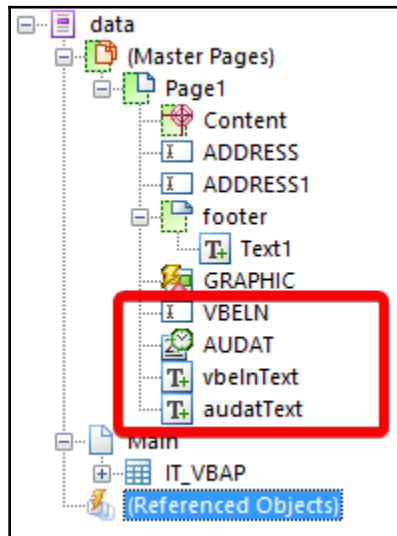
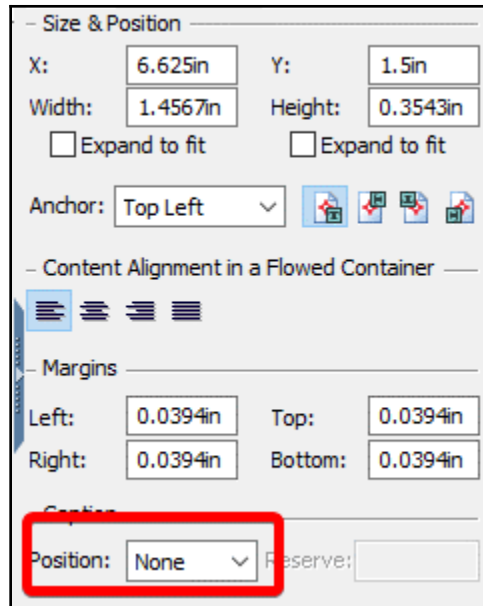
  

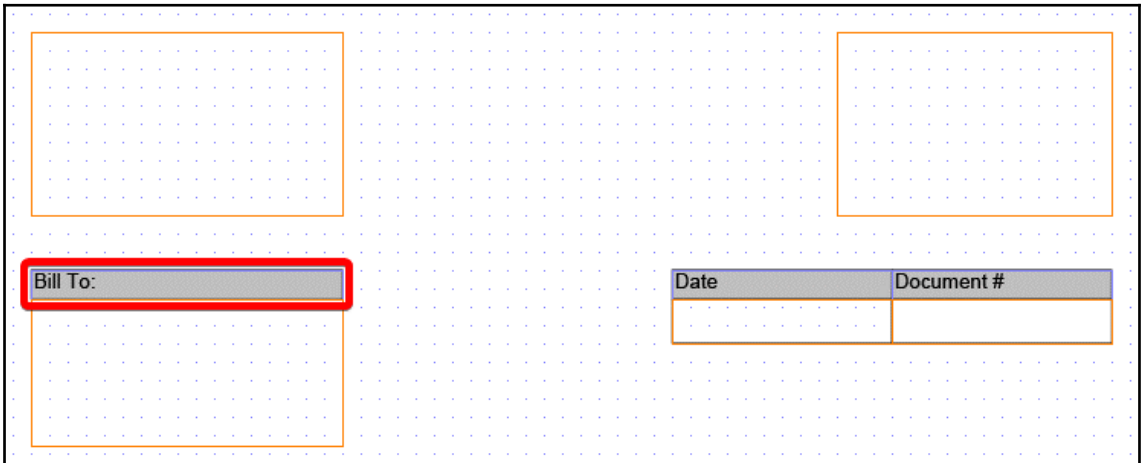
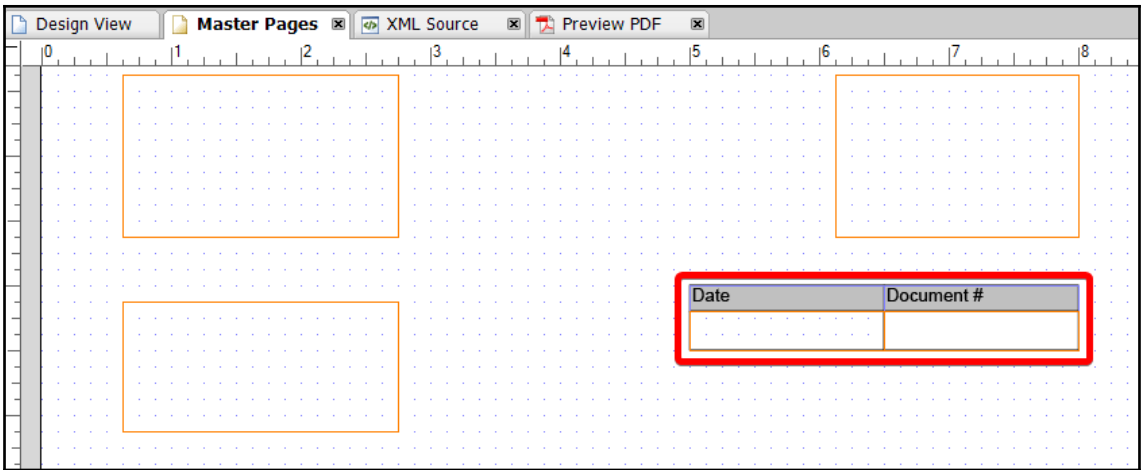
Property	Value
<b>General</b>	
Name	GRAPHIC
Description	Graphic Node GRAPHIC
Status	Active
<b>Graphic</b>	
Graphic Type	Graphic Content
<b>Graphic Content</b>	
Field	G_LOGO
MIME Type	'IMAGE/BMP'











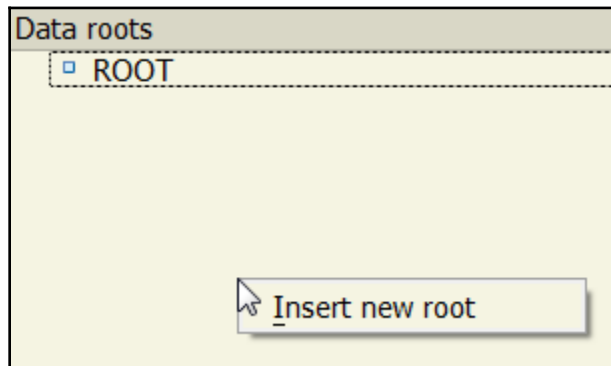
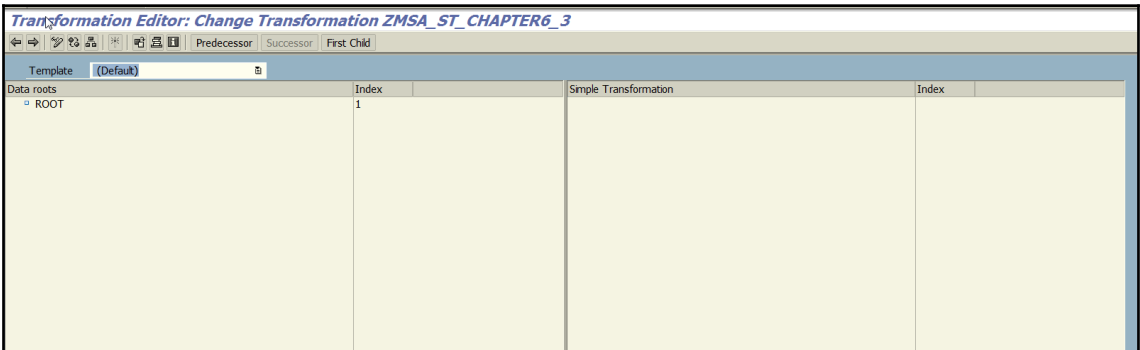
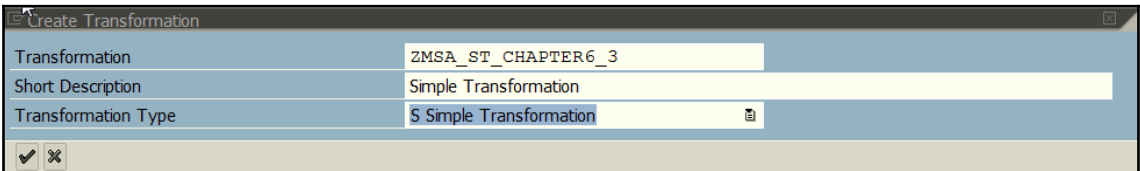
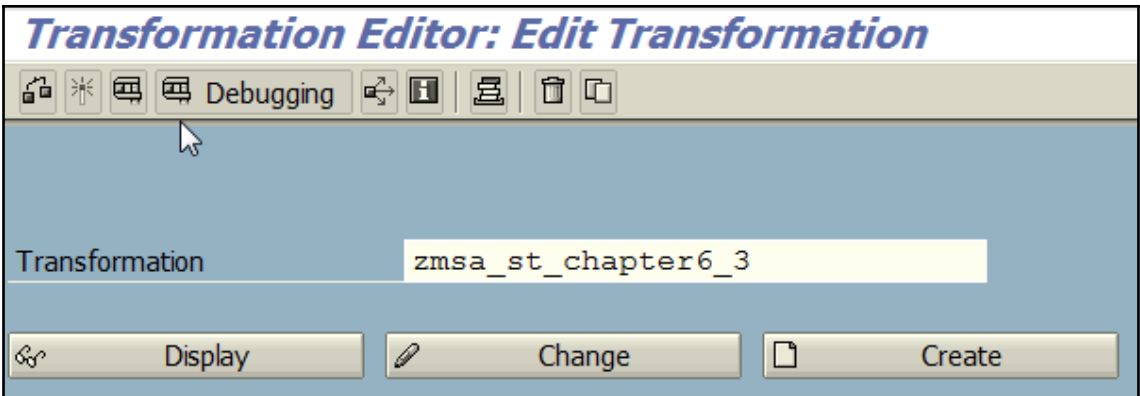
## Chapter 6: ABAP and XML

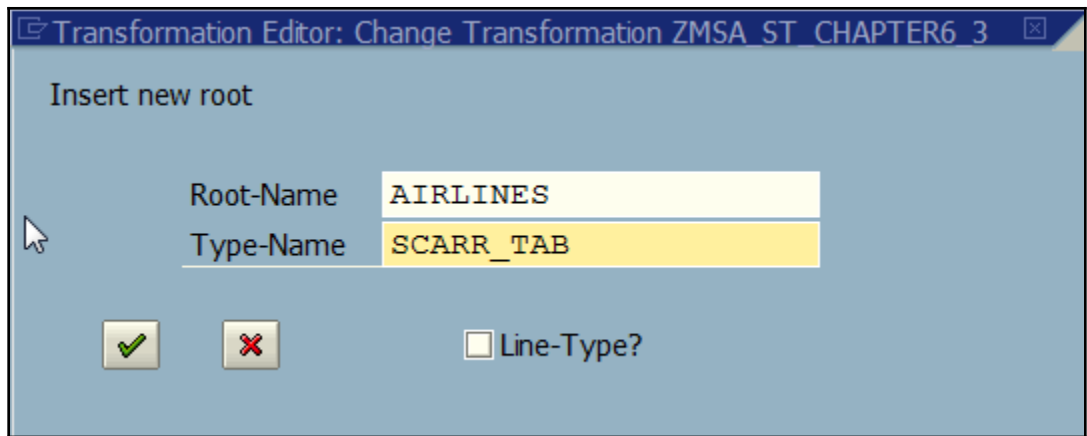
```
Display XML document

<?xml version="1.0" encoding="UTF-8"?>
- <AIRLINES>
  - <SCARR>
    <CARRID>A2</CARRID>
    <CARRNAME>Antarctica Airlines</CARRNAME>
    <CURRCODE>AQD</CURRCODE>
    <URL>http://antarcticaairlines.aq</URL>
  </SCARR>
</AIRLINES>
```

```
Display XML document

<?xml version="1.0" encoding="UTF-8"?>
- <AIRLINES>
  - <SCARR>
    <CARRID>A2</CARRID>
    <CARRNAME>Antarctica Airlines</CARRNAME>
    <CURRCODE>AQD</CURRCODE>
    <URL>http://antarcticaairlines.aq</URL>
  </SCARR>
</AIRLINES>
```





Output

LT_CARR	MANDT	CARRID	CARRNAME	CURRCODE	URL
A2		Antarctica Airlines	AOD		http://antarcticaairlines.aq

Output

```
{
  "VALUES":
  [
    {
      "CARRID": "AA",
      "CARRNAME": "American Airlines",
      "CURRCODE": "USD",
      "URL": "http://www.aa.com"
    },
    {
      "CARRID": "AC",
      "CARRNAME": "Air Canada",
      "CURRCODE": "CAD",
      "URL": "http://www.aircanada.ca"
    },
    {
      "CARRID": "AF",
      "CARRNAME": "Air France",
      "CURRCODE": "EUR",
      "URL": "http://www.airfrance.fr"
    },
    {
      "CARRID": "AZ",
      "CARRNAME": "Alitalia",
      "CURRCODE": "EUR",
      "URL": "http://www.alitalia.it"
    },
    {
      "CARRID": "BA",

```

# Chapter 7: Building User Interfaces

Screen number  New(Revised)

**Attributes** | Element list | Flow logic

Short Description

Original Language  English Package

Last Changed

Last Generation

---

**Screen Type**

Normal  
 Subscreen  
 Modal dialog box  
 Selection Dynpro

**Settings**

Hold Data  
 Switch Off Runtime Compress  
 Template (Not Executable)  
 Hold Scroll Position  
 Without Application Toolbar

---

**Other Attributes**

Next Dynpro

Cursor Position

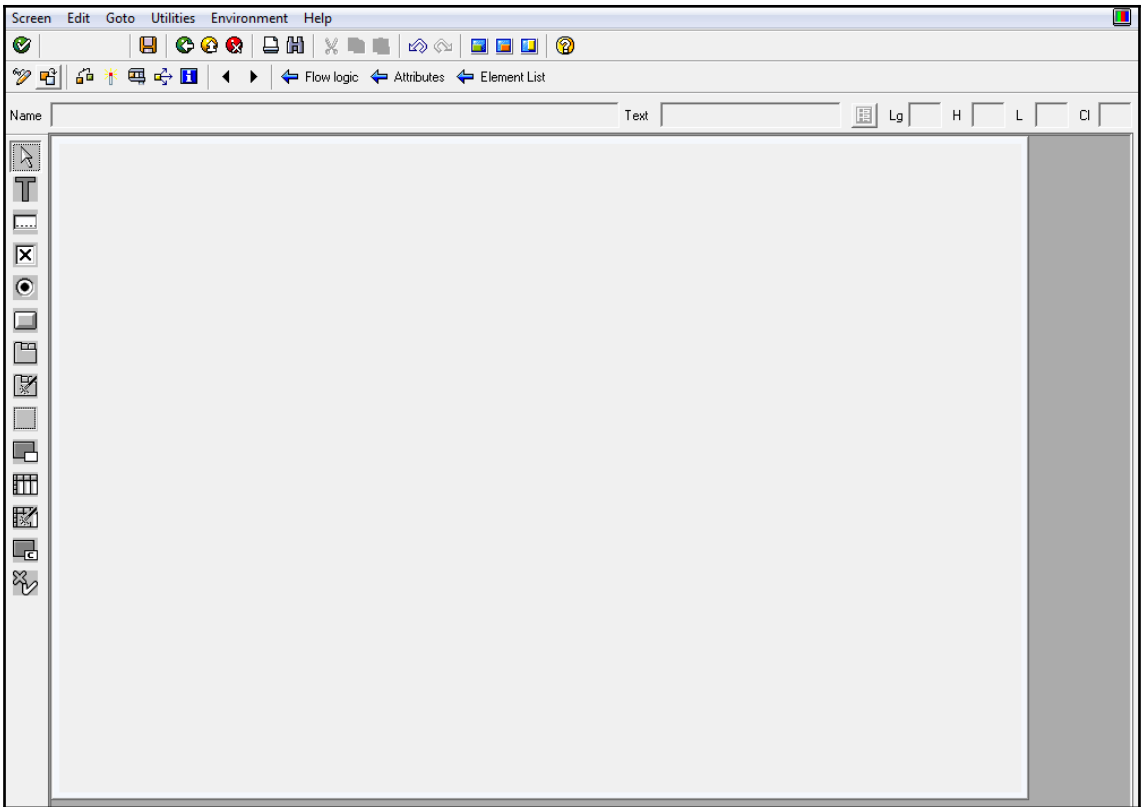
Screen Group

Rows/Columns Occupied

Editing


Context Menu FORM ON CTMENU

Properties



Mastering ABAP

Airline

Connection Number  to  

Type of flight

Domestic flights

International flights



Text Symbols			Selection Texts	List Headings
Name	Text	DDIC Refe...		
P_CAR	Airline	<input checked="" type="checkbox"/>		
P_DOM	Domestic flights	<input type="checkbox"/>		
P_INT	International flights	<input type="checkbox"/>		
S_CON	Connection Number	<input checked="" type="checkbox"/>		

Screen number  Inactive

Attributes | Element list | **Flow logic**

```

1 | PROCESS BEFORE OUTPUT.
2 | MODULE PBO_100.
3 |
4 | PROCESS AFTER INPUT.
5 | MODULE PAI_100.
    
```

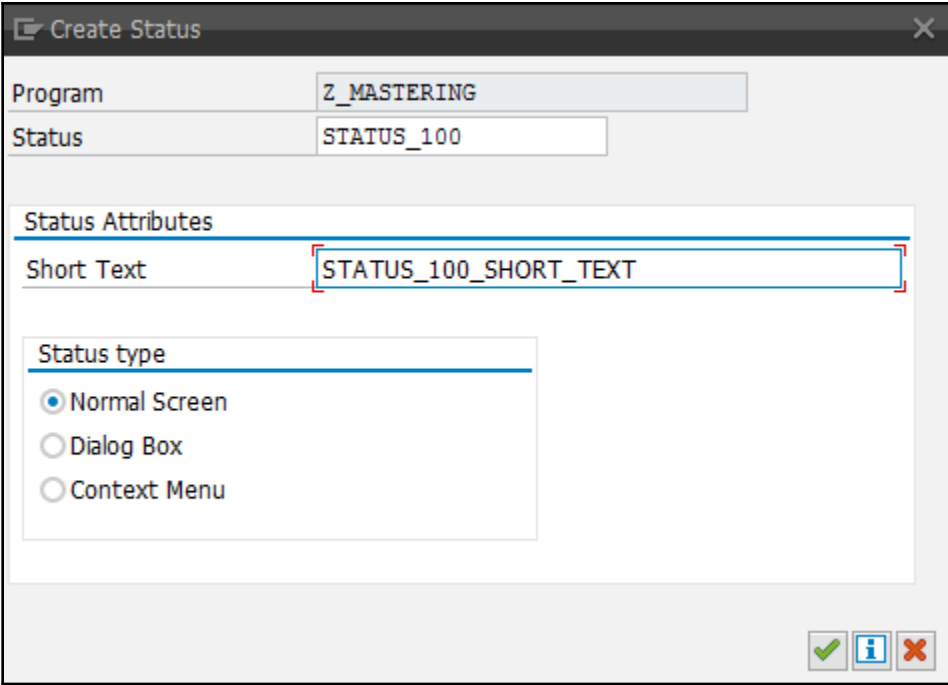
**Create Title** ✕

Program

Title Code

Title

All title  ✕



User Interface    Z\_MASTERING    Inactive (revised)

Menu Bar    STATUS\_100\_SHORT\_TEXT

Application Toolbar    STATUS\_100\_SHORT\_TEXT

Function Keys    STATUS\_100\_SHORT\_TEXT

Standard Toolbar

Recommended Function Key Settings

F2	<...>	Choose	
F9	<...>	Select	
Shift-F2	<...>	Delete	
Shift-F4	<...>	Save without check	
Shift-F5	<...>	Other <object>	

Freely Assigned Function Keys

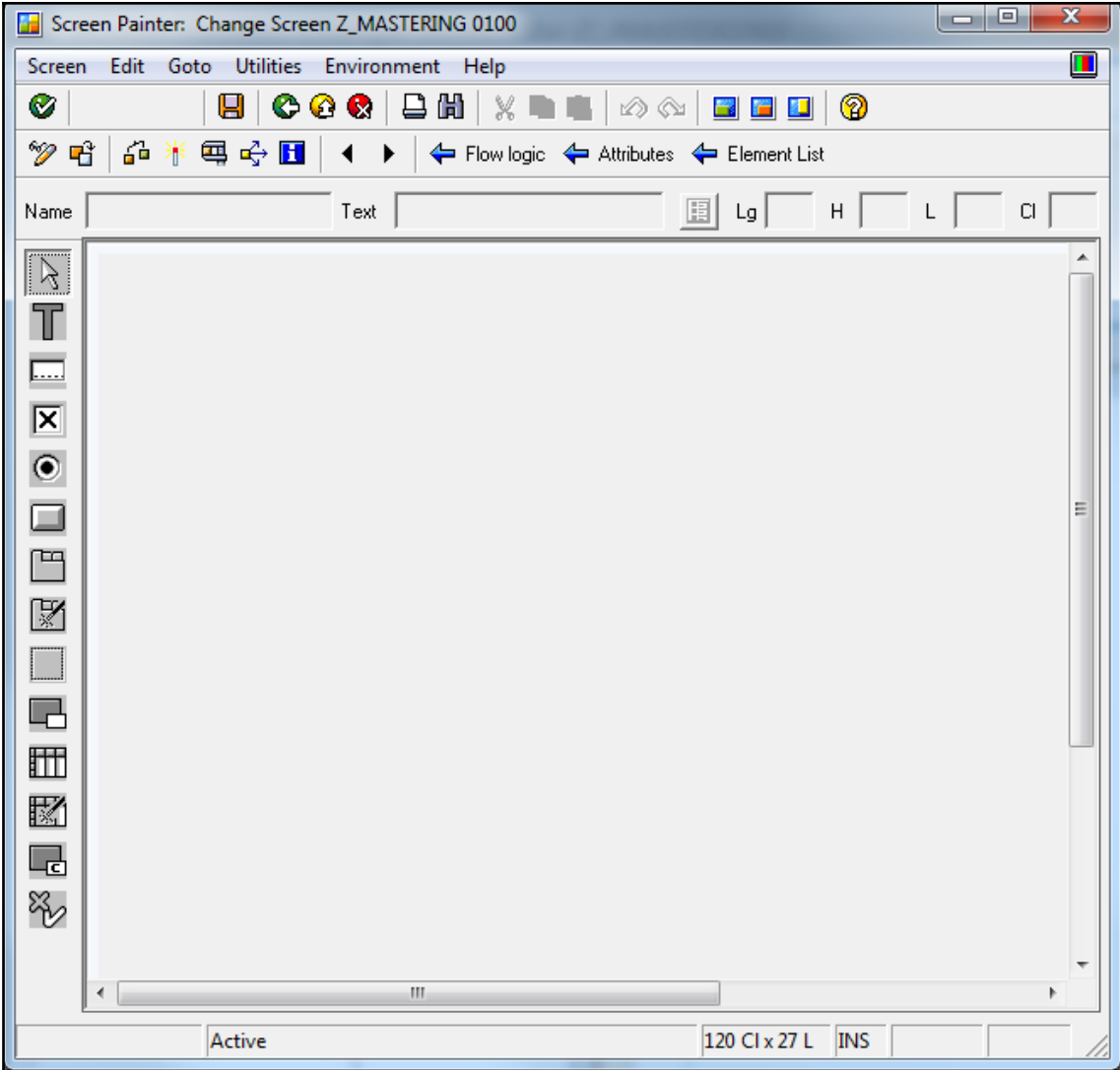
F5		
F6		
F7		
F8		
Shift-F1		
Shift-F6		
Shift-F7		
Shift-F8		
Shift-F9		
Shift-F11		
Shift-F12		
Ctrl-F1		
Ctrl-F2		
Ctrl-F3		
Ctrl-F4		
Ctrl-F5		
Ctrl-F6		
Ctrl-F7		
Ctrl-F8		
Ctrl-F9		
Ctrl-F10		
Ctrl-F11		
Ctrl-F12		
Ctrl-Shift-F1		
Ctrl-Shift-F2		
Ctrl-Shift-F3		
Ctrl-Shift-F4		
Ctrl-Shift-F5		
Ctrl-Shift-F6		
Ctrl-Shift-F7		
Ctrl-Shift-F8		

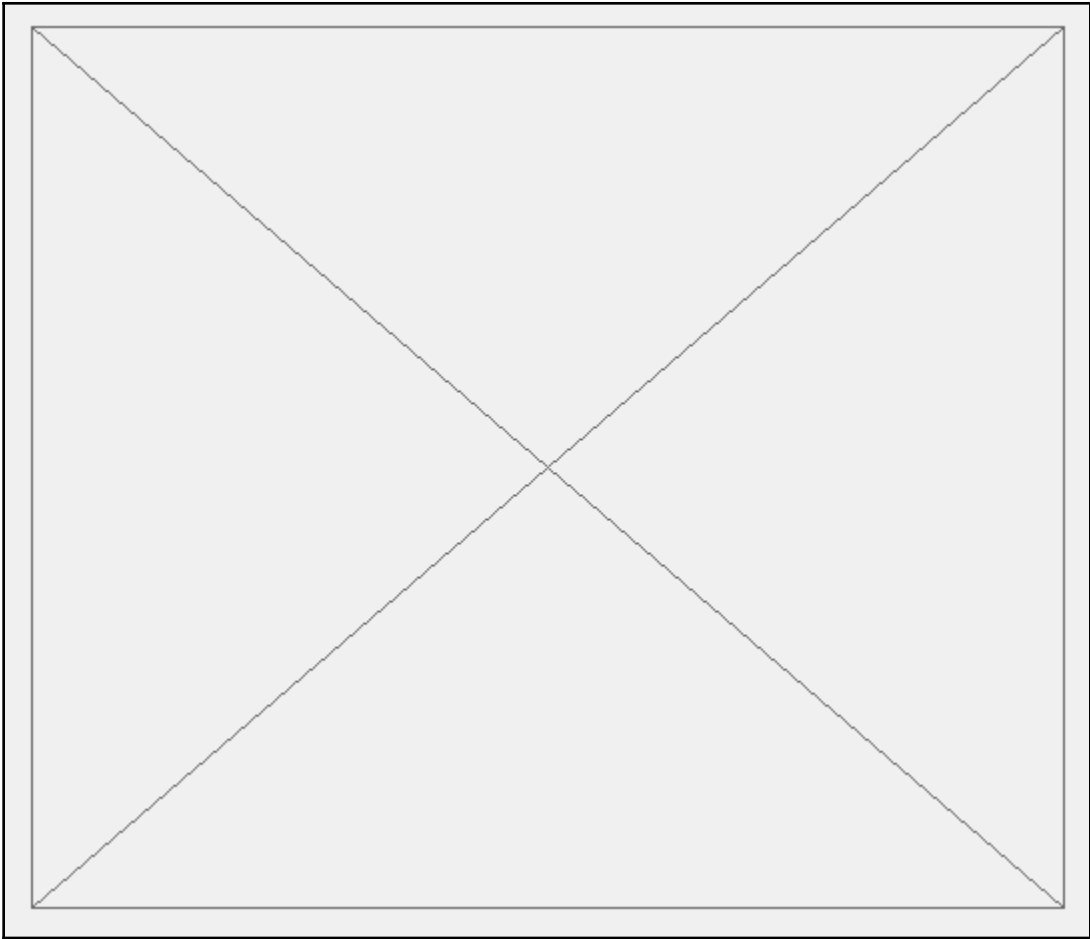
Screen number    100    Active(Revised)

Attributes    **Element list**    Flow logic

**General**    Texts/I/O Templates    Special    Display    Mod. Groups/Functions    References

H.. M Name	Typ...	Li...	C...	D...	V...	H...	S...	Format	I...	O...	Ou...	D...	Dic...	Property list
<u>OK_CODE</u>	OK	0	0	20	20	1	<input type="checkbox"/>	OK				<input type="checkbox"/>		Properties





ID	No.	Ctr	Depart. city	De...	Ctr	Arrival city	Apt	FightT...	Departure	Arrival	Distance	Dis.	C	Da...
A	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:00	14:01:00	2.572	MI		0
AA	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:00	17:21:00	2.572	MI		0
AZ	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:00	21:05:00	845	MI		0
AZ	788	IT	ROME	FCO	JP	TOKYO	TY...	12:55	12:00:00	08:55:00	6.130	MI		1
AZ	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:00	19:25:00	6.130	MI		0
AZ	790	IT	ROME	FCO	JP	OSAKA	KDX	13:35	10:35:00	08:10:00	6.030	MI	X	1
DL	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:00	09:30:00	3.851	MI		1
DL	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:00	20:37:00	2.572	MI		0
DL	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:00	18:25:00	2.572	MI		0
JL	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:00	17:35:00	9.100	KM		0
JL	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:00	15:40:00	9.100	KM	X	1
LH	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:00	11:34:00	6.162	KM		0
LH	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:00	07:45:00	6.162	KM		1
LH	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:00	15:05:00	6.162	KM	X	0
LH	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:00	11:35:00	555	KM		0
LH	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:00	08:15:00	555	KM		0
QF	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:00	05:35:00	10.000	KM		1
QF	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:00	15:05:00	10.000	KM		1
SQ	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:00	19:25:00	8.452	MI		0
SQ	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:00	02:45:00	8.452	MI		2
SQ	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:00	16:00:00	560	MI		0
SQ	988	SG	SINGAPORE	SIN	JP	TOKYO	TY...	6:40	16:35:00	00:15:00	3.125	MI		1
UA	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:00	17:06:00	5.685	MI		0
UA	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:00	10:30:00	5.685	MI		1
UA	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:00	05:45:00	6.162	KM		1
UA	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:00	12:55:00	6.162	KM		0

Graphic Bundle

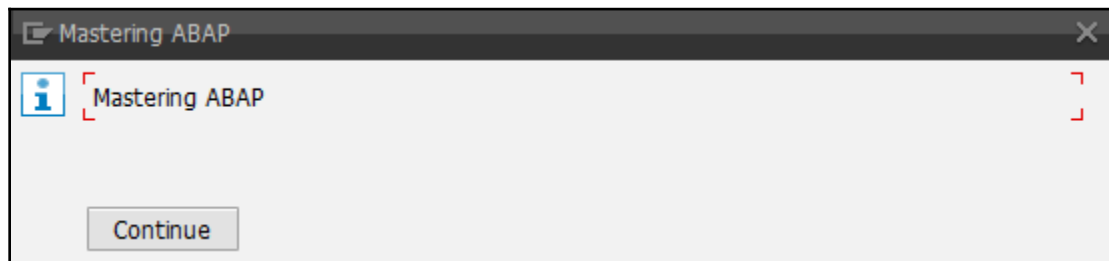
ID	No.	Ctr	Depart. city	De...	Ctr	Arrival city	Apt	FlightT...	Departure	Arrival	Distance	Dis.	C	Da...
A	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:00	14:01:00	2.572	MI		0
AA	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:00	17:21:00	2.572	MI		0
AZ	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:00	21:05:00	845	MI		0
AZ	788	IT	ROME	FCO	JP	TOKYO	TY...	12:55	12:00:00	08:55:00	6.130	MI		1
AZ	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:00	19:25:00	6.130	MI		0
AZ	790	IT	ROME	FCO	JP	OSAKA	KIX	13:35	10:35:00	08:10:00	6.030	MI	X	1
DL	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:00	09:30:00	3.851	MI		1
DL	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:00	20:37:00	2.572	MI		0
DL	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:00	18:25:00	2.572	MI		0
JL	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:00	17:35:00	9.100	KM		0
JL	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:00	15:40:00	9.100	KM	X	1
LH	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:00	11:34:00	6.162	KM		0
LH	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:00	07:45:00	6.162	KM		1
LH	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:00	15:05:00	6.162	KM	X	0
LH	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:00	11:35:00	555	KM		0
LH	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:00	08:15:00	555	KM		0
QF	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:00	05:35:00	10.000	KM		1
QF	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:00	15:05:00	10.000	KM		1
SQ	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:00	19:25:00	8.452	MI		0
SQ	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:00	02:45:00	8.452	MI		2
SQ	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:00	16:00:00	560	MI		0
SQ	988	SG	SINGAPORE	SIN	JP	TOKYO	TY...	6:40	16:35:00	00:15:00	3.125	MI		1
UA	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:00	17:06:00	5.685	MI		0
UA	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:00	10:30:00	5.685	MI		1
UA	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:00	05:45:00	6.162	KM		1
UA	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:00	12:55:00	6.162	KM		0

Airli...	Fig...	Cou...	Departure	De...	Co...	Arrival ci	Destinatio	Flight tim	Depart...	Arrival ti	Distance	UN...	F	Ar...
AA	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:...	14:01:...	2,572,00...	MI		0
AA	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:...	17:21:...	2,572,00...	MI		0
AZ	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:...	21:05:...	845,0000	MI		0
AZ	788	IT	ROME	FCO	JP	TOKYO	TYO	12:55	12:00:...	08:55:...	6,130,00...	MI		1
AZ	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:...	19:25:...	6,130,00...	MI		0
AZ	790	IT	ROME	FCO	JP	OSAKA	KIX	13:35	10:35:...	08:10:...	6,030,00...	MI	X	1
DL	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:...	09:30:...	3,851,00...	MI		1
DL	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:...	20:37:...	2,572,00...	MI		0
DL	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:...	18:25:...	2,572,00...	MI		0
JL	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:...	17:35:...	9,100,00...	KM		0
JL	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:...	15:40:...	9,100,00...	KM	X	1
LH	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:...	11:34:...	6,162,00...	KM		0
LH	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:...	07:45:...	6,162,00...	KM		1
LH	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:...	15:05:...	6,162,00...	KM	X	0
LH	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:...	11:35:...	555,0000	KM		0
LH	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:...	08:15:...	555,0000	KM		0
QF	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:...	05:35:...	10,000,0...	KM		1
QF	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:...	15:05:...	10,000,0...	KM		1
SQ	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:...	19:25:...	8,452,00...	MI		0
SQ	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:...	02:45:...	8,452,00...	MI		2
SQ	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:...	16:00:...	560,0000	MI		0
SQ	988	SG	SINGAPORE	SIN	JP	TOKYO	TYO	6:40	16:35:...	00:15:...	3,125,00...	MI		1
UA	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:...	17:06:...	5,685,00...	MI		0
UA	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:...	10:30:...	5,685,00...	MI		1
UA	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:...	05:45:...	6,162,00...	KM		1
UA	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:...	12:55:...	6,162,00...	KM		0

Airli...	Fig...	Cou...	Departure	De...	Co...	Arrival ci	Destinatio	Flight tim	Depart...	Arrival ti	Distance	UN...	F	Ar...
AA	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:...	14:01:...	2,572,00...	MI		0
AA	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:...	17:21:...	2,572,00...	MI		0
AZ	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:...	21:05:...	845,0000	MI		0
AZ	788	IT	ROME	FCO	JP	TOKYO	TYO	12:55	12:00:...	08:55:...	6,130,00...	MI		1
AZ	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:...	19:25:...	6,130,00...	MI		0
AZ	790	IT	ROME	FCO	JP	OSAKA	KIX	13:35	10:35:...	08:10:...	6,030,00...	MI	X	1
DL	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:...	09:30:...	3,851,00...	MI		1
DL	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:...	20:37:...	2,572,00...	MI		0
DL	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:...	18:25:...	2,572,00...	MI		0
JL	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:...	17:35:...	9,100,00...	KM		0
JL	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:...	15:40:...	9,100,00...	KM	X	1
LH	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:...	11:34:...	6,162,00...	KM		0
LH	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:...	07:45:...	6,162,00...	KM		1
LH	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:...	15:05:...	6,162,00...	KM	X	0
LH	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:...	11:35:...	555,0000	KM		0
LH	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:...	08:15:...	555,0000	KM		0
QF	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:...	05:35:...	10,000,0...	KM		1
QF	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:...	15:05:...	10,000,0...	KM		1
SQ	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:...	19:25:...	8,452,00...	MI		0
SQ	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:...	02:45:...	8,452,00...	MI		2
SQ	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:...	16:00:...	560,0000	MI		0
SQ	988	SG	SINGAPORE	SIN	JP	TOKYO	TYO	6:40	16:35:...	00:15:...	3,125,00...	MI		1
UA	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:...	17:06:...	5,685,00...	MI		0
UA	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:...	10:30:...	5,685,00...	MI		1
UA	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:...	05:45:...	6,162,00...	KM		1
UA	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:...	12:55:...	6,162,00...	KM		0



Airli...	Button	Flg...	Cou...	Departure	De...	Co...	Arrival ci	Destinatio	Flight tim	Depart...	Arrival ti	Distance	UN...	F	Ar...
AA	Click	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:...	14:01:...	2.572,00...	MI		0
AA	Click	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:...	17:21:...	2.572,00...	MI		0
AZ	Click	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:...	21:05:...	845,0000	MI		0
AZ	Click	788	IT	ROME	FCO	JP	TOKYO	TYO	12:55	12:00:...	08:55:...	6.130,00...	MI		1
AZ	Click	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:...	19:25:...	6.130,00...	MI		0
AZ	Click	790	IT	ROME	FCO	JP	OSAKA	KIX	13:35	10:35:...	08:10:...	6.030,00...	MI	X	1
DL	Click	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:...	09:30:...	3.851,00...	MI		1
DL	Click	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:...	20:37:...	2.572,00...	MI		0
DL	Click	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:...	18:25:...	2.572,00...	MI		0
JL	Click	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:...	17:35:...	9.100,00...	KM		0
JL	Click	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:...	15:40:...	9.100,00...	KM	X	1
LH	Click	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:...	11:34:...	6.162,00...	KM		0
LH	Click	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:...	07:45:...	6.162,00...	KM		1
LH	Click	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:...	15:05:...	6.162,00...	KM	X	0
LH	Click	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:...	11:35:...	555,0000	KM		0
LH	Click	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:...	08:15:...	555,0000	KM		0
QF	Click	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:...	05:35:...	10.000,0...	KM		1
QF	Click	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:...	15:05:...	10.000,0...	KM		1
SQ	Click	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:...	19:25:...	8.452,00...	MI		0
SQ	Click	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:...	02:45:...	8.452,00...	MI		2
SQ	Click	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:...	16:00:...	560,0000	MI		0
SQ	Click	988	SG	SINGAPORE	SIN	JP	TOKYO	TYO	6:40	16:35:...	00:15:...	3.125,00...	MI		1
UA	Click	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:...	17:06:...	5.685,00...	MI		0
UA	Click	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:...	10:30:...	5.685,00...	MI		1
UA	Click	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:...	05:45:...	6.162,00...	KM		1
UA	Click	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:...	12:55:...	6.162,00...	KM		0



Airl...	Flg...	Cou...	Departure	De...	Co...	Arrival ci	Destinatio	Flight tim	Depart...	Arrival ti	Distance	UN...	Charter?	Ar...
AA	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:...	14:01:...	2.572,00...	MI	✗	0
AA	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:...	17:21:...	2.572,00...	MI	✗	0
AZ	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:...	21:05:...	845,0000	MI	✗	0
AZ	788	IT	ROME	FCO	JP	TOKYO	TYO	12:55	12:00:...	08:55:...	6.130,00...	MI	✗	1
AZ	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:...	19:25:...	6.130,00...	MI	✗	0
AZ	790	IT	ROME	FCO	JP	OSAKA	KIX	13:35	10:35:...	08:10:...	6.030,00...	MI	✓	1
DL	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:...	09:30:...	3.851,00...	MI	✗	1
DL	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:...	20:37:...	2.572,00...	MI	✗	0
DL	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:...	18:25:...	2.572,00...	MI	✗	0
JL	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:...	17:35:...	9.100,00...	KM	✗	0
JL	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:...	15:40:...	9.100,00...	KM	✓	1
LH	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:...	11:34:...	6.162,00...	KM	✗	0
LH	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:...	07:45:...	6.162,00...	KM	✗	1
LH	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:...	15:05:...	6.162,00...	KM	✓	0
LH	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:...	11:35:...	555,0000	KM	✗	0
LH	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:...	08:15:...	555,0000	KM	✗	0
QF	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:...	05:35:...	10.000,0...	KM	✗	1
QF	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:...	15:05:...	10.000,0...	KM	✗	1
SQ	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:...	19:25:...	8.452,00...	MI	✗	0
SQ	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:...	02:45:...	8.452,00...	MI	✗	2
SQ	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:...	16:00:...	560,0000	MI	✗	0
SQ	988	SG	SINGAPORE	SIN	JP	TOKYO	TYO	6:40	16:35:...	00:15:...	3.125,00...	MI	✗	1
UA	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:...	17:06:...	5.685,00...	MI	✗	0
UA	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:...	10:30:...	5.685,00...	MI	✗	1
UA	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:...	05:45:...	6.162,00...	KM	✗	1
UA	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:...	12:55:...	6.162,00...	KM	✗	0

Airl...	Button	Flg...	Cou...	Departure	De...	Co...	Arrival ci	Destinatio	Flight tim	Depart...	Arrival ti	Distance	UN...	Charter?	Ar...
AA	Click	17	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:01	11:00:...	14:01:...	2.572,00...	MI	✗	0
AA	Click	64	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:21	09:00:...	17:21:...	2.572,00...	MI	✗	0
AZ	Click	555	IT	ROME	FCO	DE	FRANKFURT	FRA	2:05	19:00:...	21:05:...	845,0000	MI	✗	0
AZ	Click	788	IT	ROME	FCO	JP	TOKYO	TYO	12:55	12:00:...	08:55:...	6.130,00...	MI	✗	1
AZ	Click	789	JP	TOKYO	TY...	IT	ROME	FCO	15:40	11:45:...	19:25:...	6.130,00...	MI	✗	0
AZ	Click	790	IT	ROME	FCO	JP	OSAKA	KIX	13:35	10:35:...	08:10:...	6.030,00...	MI	✓	1
DL	Click	106	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:55	19:35:...	09:30:...	3.851,00...	MI	✗	1
DL	Click	1699	US	NEW YORK	JFK	US	SAN FRANCISCO	SFO	6:22	17:15:...	20:37:...	2.572,00...	MI	✗	0
DL	Click	1984	US	SAN FRANCISCO	SFO	US	NEW YORK	JFK	5:25	10:00:...	18:25:...	2.572,00...	MI	✗	0
JL	Click	407	JP	TOKYO	NRT	DE	FRANKFURT	FRA	12:05	13:30:...	17:35:...	9.100,00...	KM	✗	0
JL	Click	408	DE	FRANKFURT	FRA	JP	TOKYO	NRT	11:15	20:25:...	15:40:...	9.100,00...	KM	✓	1
LH	Click	400	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:24	10:10:...	11:34:...	6.162,00...	KM	✗	0
LH	Click	401	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:15	18:30:...	07:45:...	6.162,00...	KM	✗	1
LH	Click	402	DE	FRANKFURT	FRA	US	NEW YORK	JFK	7:35	13:30:...	15:05:...	6.162,00...	KM	✓	0
LH	Click	2402	DE	FRANKFURT	FRA	DE	BERLIN	SXF	1:05	10:30:...	11:35:...	555,0000	KM	✗	0
LH	Click	2407	DE	BERLIN	TXL	DE	FRANKFURT	FRA	1:05	07:10:...	08:15:...	555,0000	KM	✗	0
QF	Click	5	SG	SINGAPORE	SIN	DE	FRANKFURT	FRA	13:45	22:50:...	05:35:...	10.000,0...	KM	✗	1
QF	Click	6	DE	FRANKFURT	FRA	SG	SINGAPORE	SIN	11:10	20:55:...	15:05:...	10.000,0...	KM	✗	1
SQ	Click	2	SG	SINGAPORE	SIN	US	SAN FRANCISCO	SFO	18:25	17:00:...	19:25:...	8.452,00...	MI	✗	0
SQ	Click	15	US	SAN FRANCISCO	SFO	SG	SINGAPORE	SIN	18:45	16:00:...	02:45:...	8.452,00...	MI	✗	2
SQ	Click	158	SG	SINGAPORE	SIN	ID	JAKARTA	JKT	1:35	15:25:...	16:00:...	560,0000	MI	✗	0
SQ	Click	988	SG	SINGAPORE	SIN	JP	TOKYO	TYO	6:40	16:35:...	00:15:...	3.125,00...	MI	✗	1
UA	Click	941	DE	FRANKFURT	FRA	US	SAN FRANCISCO	SFO	11:36	14:30:...	17:06:...	5.685,00...	MI	✗	0
UA	Click	3504	US	SAN FRANCISCO	SFO	DE	FRANKFURT	FRA	10:30	15:00:...	10:30:...	5.685,00...	MI	✗	1
UA	Click	3516	US	NEW YORK	JFK	DE	FRANKFURT	FRA	7:25	16:20:...	05:45:...	6.162,00...	KM	✗	1
UA	Click	3517	DE	FRANKFURT	FRA	US	NEW YORK	JFK	8:15	10:40:...	12:55:...	6.162,00...	KM	✗	0



Name  Text  Lg  H  L  Cl

**Target language for translation**

Original language  glish

Target language

**LIMU DYNP Z\_MASTERING 0100 (enUS->deDE)**

Sequentially Process Objects

Collections: 2 objects (Sorted Descending By -Number of New Lines-)

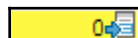
	2	2
<SRT4> Screen Painter Texts (PROG)	1	1
<SRH4> Screen Painter Headers (PROG)	1	1

**SRT4 (..) enUS -> deDE: Z\_MASTERING 0100**

(No comment exists for object)

[DIXT 00001] Mastering ABAP (14)

[ ]

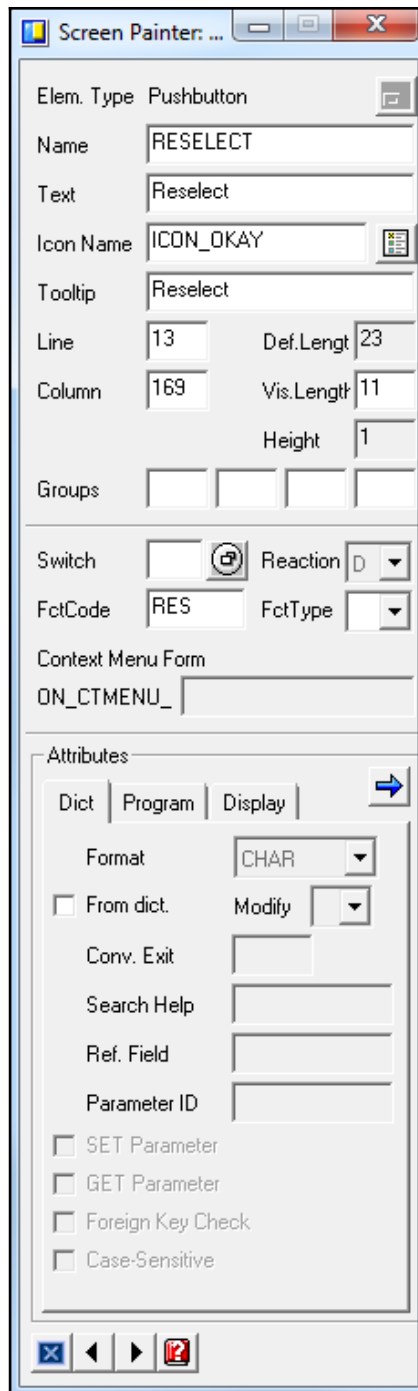


The screenshot shows the 'Screen Painter' dialog box with the following configuration:

- Elem. Type:** Input/Output Field
- Name:** GV\_CARRID
- Text:** (empty)
- Dropdown:** (empty)
- With Icon:**  **Scrollable:**
- Line:** 5 **Def. Lengt:** 9
- Column:** 186 **Vis. Length:** 9
- Height:** 1
- Groups:** (four empty boxes)
- Switch:**   **Reaction:** D
- FctCode:** (empty) **FctType:** (empty)
- Context Menu Form:** ON\_CTMENU\_
- Attributes:**
  - Dict:** Program **Display:** (arrow icon)
  - Format:** CHAR
  - From dict.** **Modify:** (empty)
  - Conv. Exit:** (empty)
  - Search Help:** (empty)
  - Ref. Field:** (empty)
  - Parameter ID:** (empty)
  - SET Parameter**
  - GET Parameter**
  - Foreign Key Check**
  - Case-Sensitive**

At the bottom of the dialog are icons for Close, Previous, Next, and Help.





Mastering ABAP

Do you want to choose other data?

Airline

Flight Conn Num

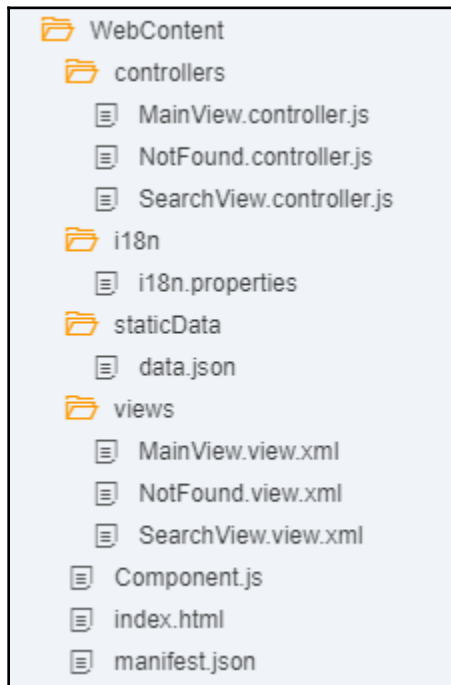
Select type of flight?

Domestic

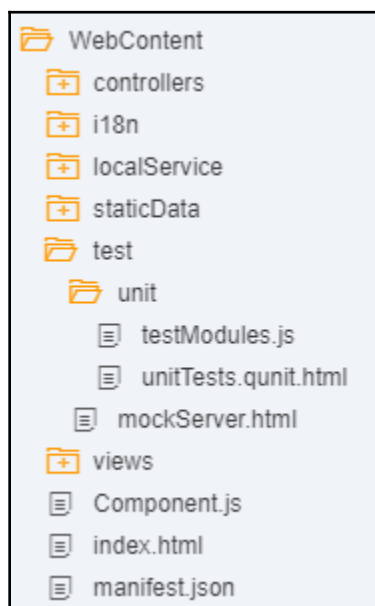
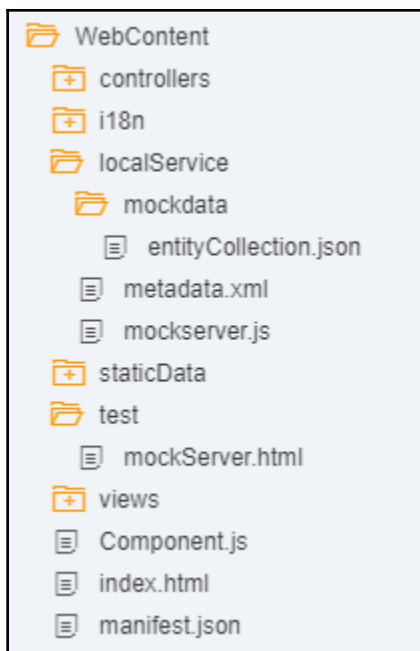
International

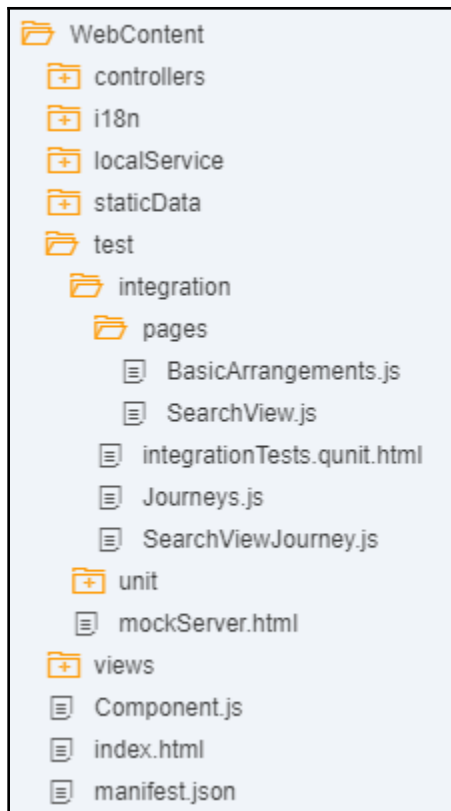
Reselect

## Chapter 8: Creating Stunning UI5 Interfaces

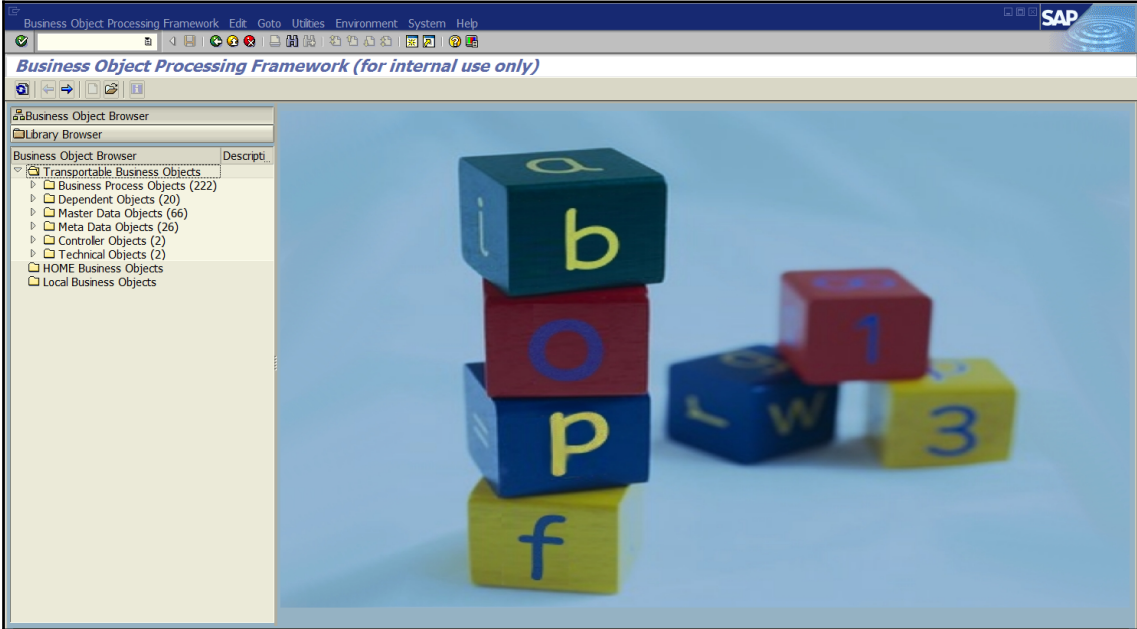


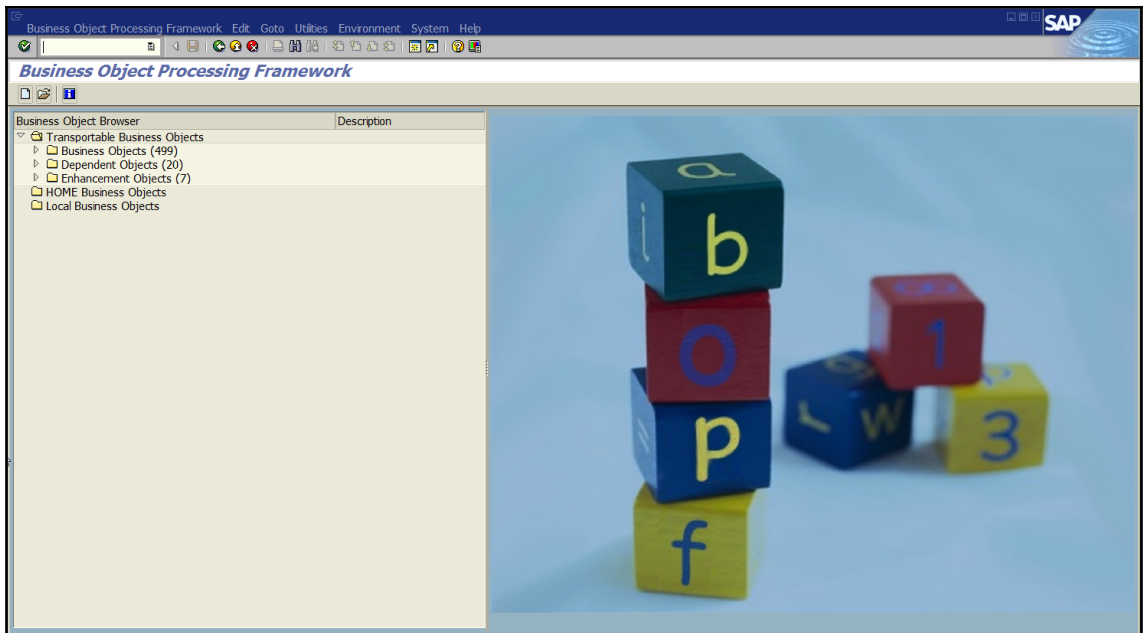
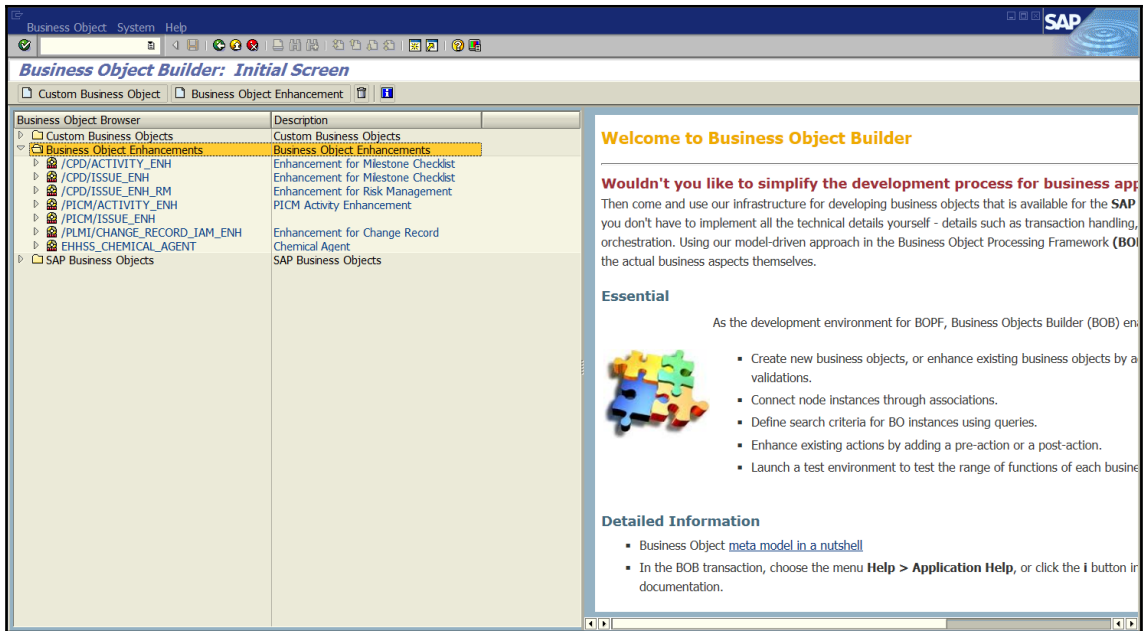


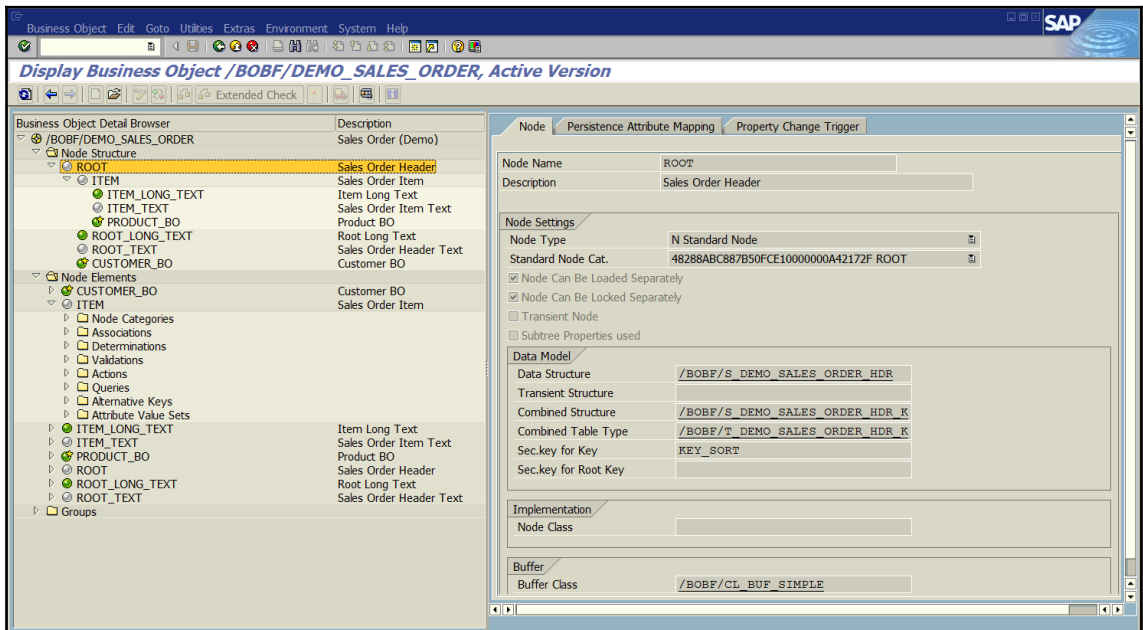
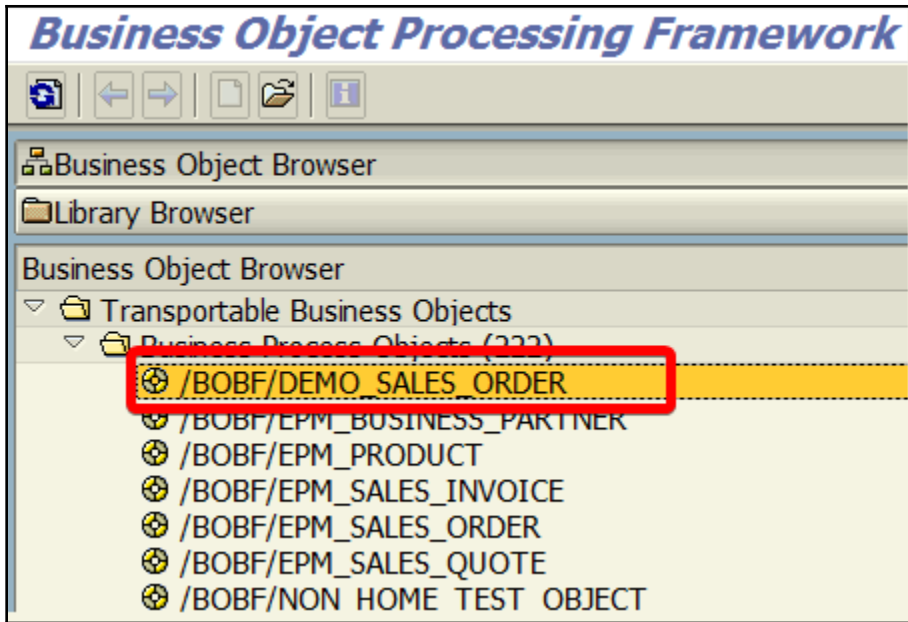




# Chapter 9: Business Object Processing Framework







**General Table Display**

Background | Number of Entries | All Entries

Table: /BOBF/DM\_PRD\_HDR | Product Header (Demo)

Text table:  No texts

Layout:  Maintain entries

Maximum no. of hits: 500

Selection Criteria

Fld name	O...	Fr. Value	To value	More	Output	Technical name
Client						MANDT
NodeID					<input checked="" type="checkbox"/>	DB_KEY
NodeID					<input checked="" type="checkbox"/>	NODE_CAT_KEY
Product ID					<input checked="" type="checkbox"/>	PRODUCT_ID
Product Type					<input checked="" type="checkbox"/>	PRODUCT_TYPE
Base UOM					<input checked="" type="checkbox"/>	BASE_UOM
Selling Price					<input checked="" type="checkbox"/>	SELL_PRICE
Curr (Sell Price)					<input checked="" type="checkbox"/>	SELL_PRICE_CURR
Purchase Price					<input checked="" type="checkbox"/>	BUY_PRICE

**/BOBF/DM\_PRD\_HDR: Display of Entries Found**

Search in Table: /BOBF/DM\_PRD\_HDR | Product Header (Demo)

Number of hits: 1

Runtime: 0 | Maximum no. of hits: 500

NodeID	NodeID	Product ID	ProductType	BaseUOM	Selling Price	Curr(Sell)	Pur. Price	Curr(Buy)	Created By	Created on	Changed By	Changed on
000C29BD36411ED983F2D67189348D6F	00000000000000000000000000000000	101	FOOD	KG	20.000,00	USD	10.000,00	USD	PGRZESKO	03.01.2019 21:32:34	PGRZESKO	03.01.2019 21:32:34

**/BOBF/DM\_PRD\_HDT: Display of Entries Found**

Search in Table: /BOBF/DM\_PRD\_HDT | Header Text

Number of hits: 1

Runtime: 0 | Maximum no. of hits: 500

NodeID	NodeID	NodeID	Language	Descr.
000C29BD36411ED983F2D6718934AD6F	000C29BD36411ED983F2D67189348D6F	00000000000000000000000000000000	EN	Banana

**Program ZMSA\_R\_CHAPTER9\_1**

Program ZMSA\_R\_CHAPTER9\_1

Instance with the same key already exists

**Program ZMSA\_R\_CHAPTER9\_1**

Program ZMSA\_R\_CHAPTER9\_1

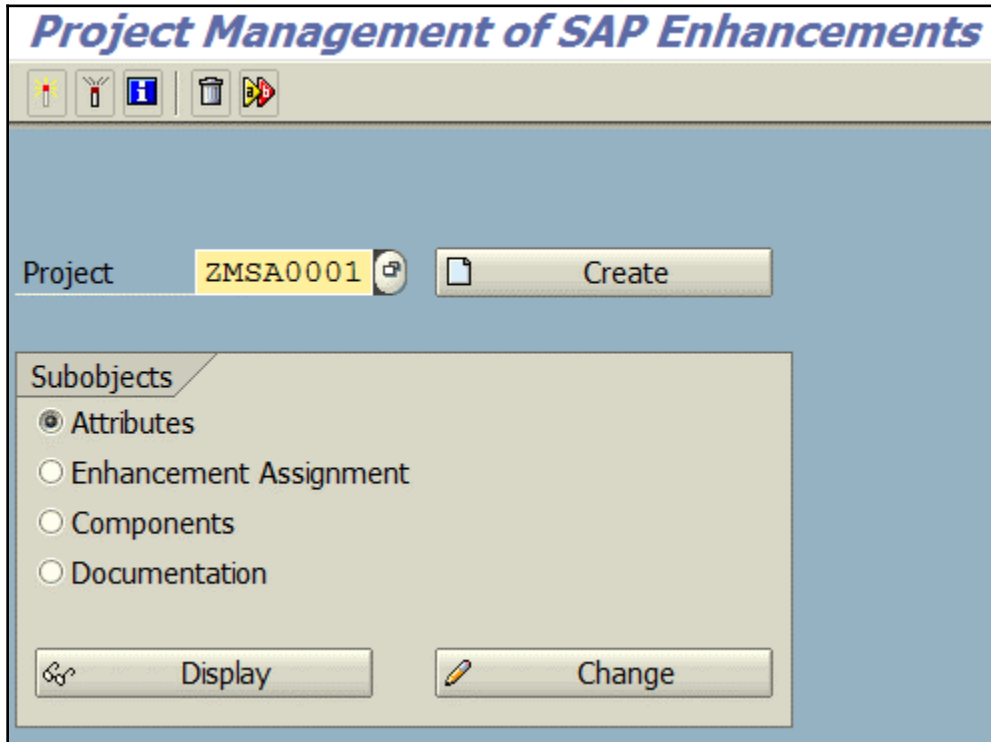
Product # 101

Product Banana

Buy Price 1,000000

Sell Price 2,000000

# Chapter 10: Modification and Customization Techniques





**Attributes of Enhancement Project ZMSA0001**

Enhancement assignments | **Components**

Project: ZMSA0001  
Short text: **First Enhancement Project**

**Administrative Data**

Package		
Original language	EN	
Created by	COMM13	25.07.2018
Last Changed On		

**Activation**

Project Status		
Changed		

**Attributes of Enhancement Project ZMSA0001**

**Enhancement assignments** | Components

Project: ZMSA0001  
Short text: **First Enhancement Project**

**Administrative Data**

Package		
Original language	EN	
Created by	COMM13	25.07.2018
Last Changed On		

**Activation**

Project Status		
Changed		

**SAP Enhancements in Enhancement Project ZMSA0001**

Enhancement    Components

Enhancement	Text
SAPMF02D	User exits: Customer master data

**Change ZMSA0001**

Enhancement assignments    Enhancement

Project		❌		ZMSA0001 First Enhancement Project
Enhancement	Impl	❌	Exp	SAPMF02D User exits: Customer master data
Function exit				EXIT_SAPMF02D_001

**Function Builder: Display EXIT\_SAPMF02D\_001**


Function module: EXIT\_SAPMF02D\_001 Active

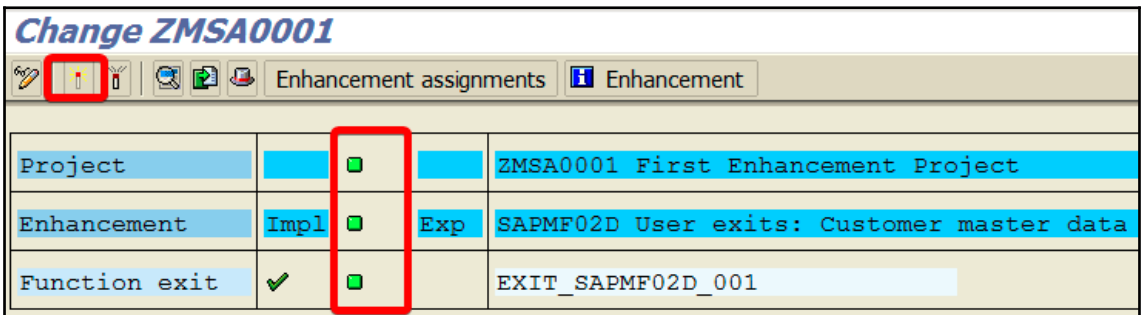
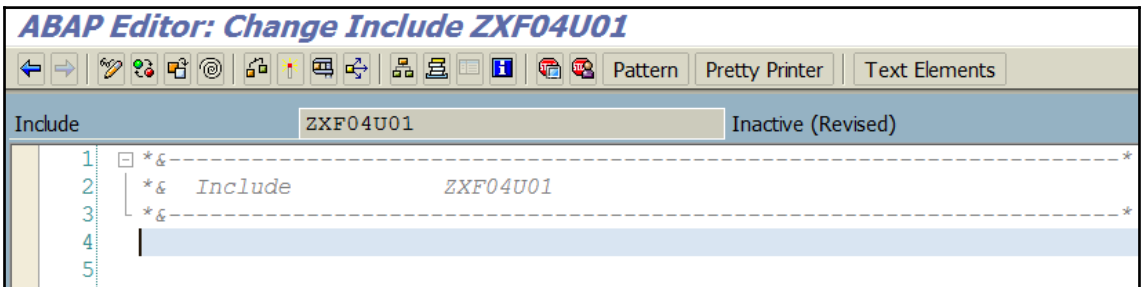
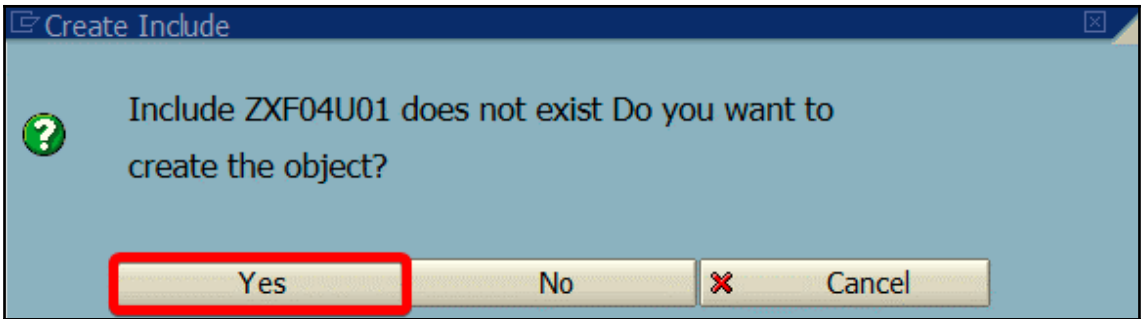
Attributes Import Export Changing Tables Exceptions Source code

```



1  FUNCTION EXIT_SAPMF02D_001.
2  **-----
3  ***"Lokale Schnittstelle:
4  **      IMPORTING
5  **          VALUE(I_KNA1) LIKE  KNA1 STRUCTURE  KNA1
6  **          VALUE(I_KNB1) LIKE  KNB1 STRUCTURE  KNB1 OPTIONAL
7  **          VALUE(I_KNVV) LIKE  KNVV STRUCTURE  KNVV OPTIONAL
8  **          VALUE(I_ADDRHANDLE) LIKE  ADDR1_SEL-ADDRHANDLE
9  **                                     OPTIONAL
10 **      TABLES
11 **          T_KNAS STRUCTURE  KNAS OPTIONAL
12 **          T_KNAT STRUCTURE  KNAT OPTIONAL
13 **          T_KNB5 STRUCTURE  KNB5 OPTIONAL
14 **          T_KNBK STRUCTURE  KNBK OPTIONAL
15 **          T_KNBW STRUCTURE  KNBW OPTIONAL
16 **          T_KNEX STRUCTURE  KNEX OPTIONAL
17 **          T_KNVA STRUCTURE  KNVA OPTIONAL
18 **          T_KNVD STRUCTURE  KNVD OPTIONAL
19 **          T_KNVI STRUCTURE  KNVI OPTIONAL
20 **          T_KNVK STRUCTURE  KNVK OPTIONAL
21 **          T_KNVL STRUCTURE  KNVL OPTIONAL
22 **          T_KNVP STRUCTURE  KNVP OPTIONAL
23 **          T_KNZA STRUCTURE  KNZA OPTIONAL
24 **-----
25
26
27  INCLUDE ZXF04U01.
28
29
30  ENDFUNCTION.



```

 Program names ZX... are reserved for includes of exit function groups



Customer Create: Initial Screen

Account group  0002 Goods recipient 

Customer  

Company code


Sales area

Sales Organization

Distribution Channel

Division

Reference






Customer 

Company code

Sales organization

Distribution channel

Reference division

### Create Customer: General Data

Other Customer

Customer: INTERNAL

Address | Control Data | Payment Transactions | Marketing | Unloading Points | Export Data | Contact Person

Preview

**Name**

Title: Mr.

Name: John Doe

**Search Terms**

Search term 1/2: 001 Polish

**Street Address**

Street/House number:

Postal Code/City: 50-015 Wrocław

Country: PL Region:

Transportation Zone: 0000000001

**PO Box Address**

PO Box:

Postal code:

Company Postal Code:

**Communication**

Language: EN English

Telephone:  Extension:

Mobile Phone:







Fax:  Extension:

E-Mail:

Standard Method:






VAT number for this country is obligatory

### Change View "Customer Products": Overview

New Entries      








Product	Text	RFC destination	A
IS-BEV	Beverage Solution		<input type="checkbox"/>
SEDUNN	Dunning interface - Sweden		<input type="checkbox"/>

### New Entries: Overview of Added Entries




    

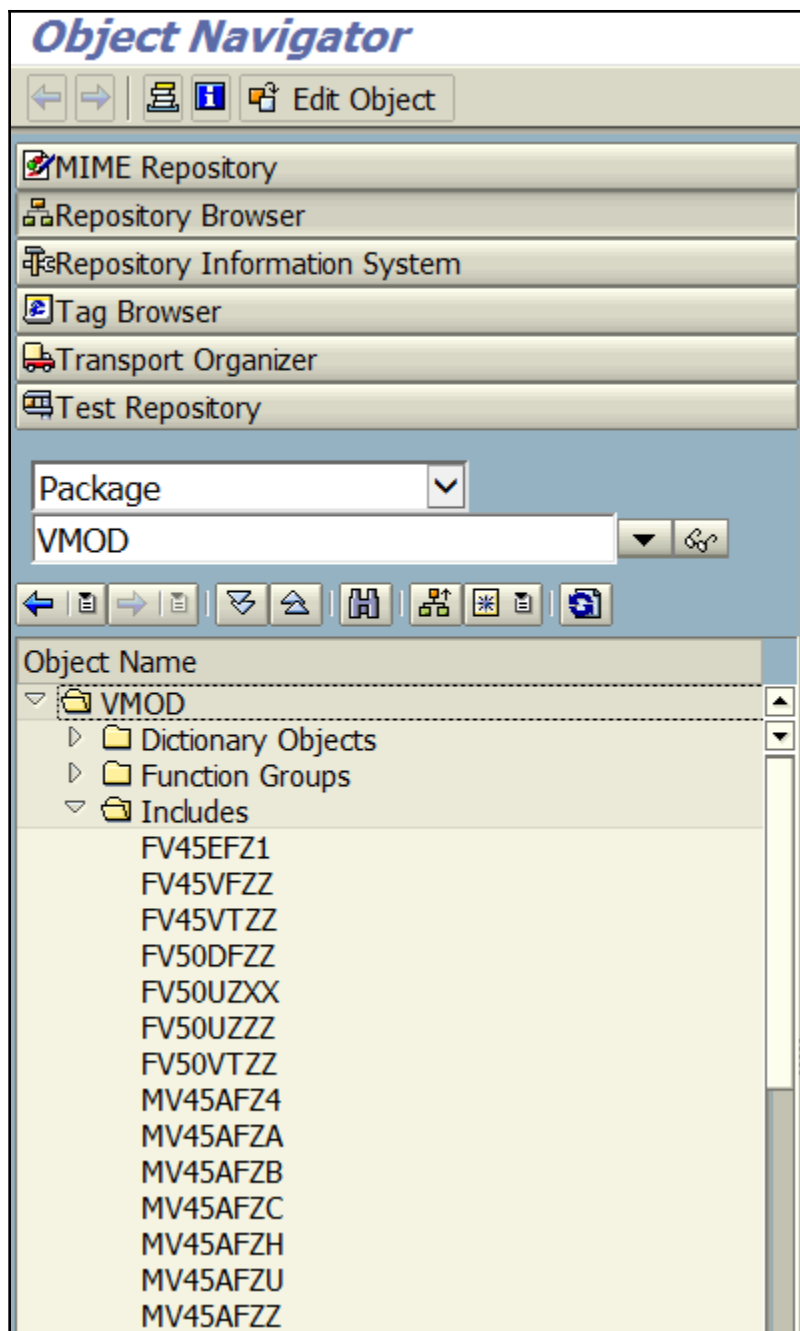
Product	Text	RFC destination	A
ZMSA	First BTE Product for FI		<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>			<input type="checkbox"/>
<input checked="" type="checkbox"/>			<input type="checkbox"/>

### Function Builder: Initial Screen

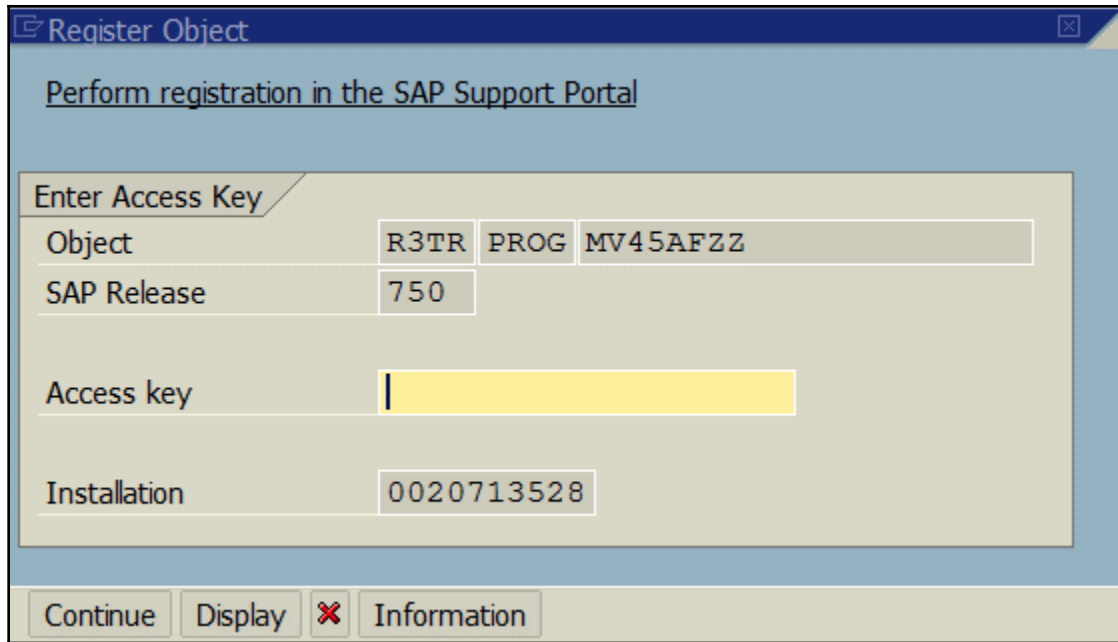
       Reassign...

Function Module

 Display  Change  Create







Register Object

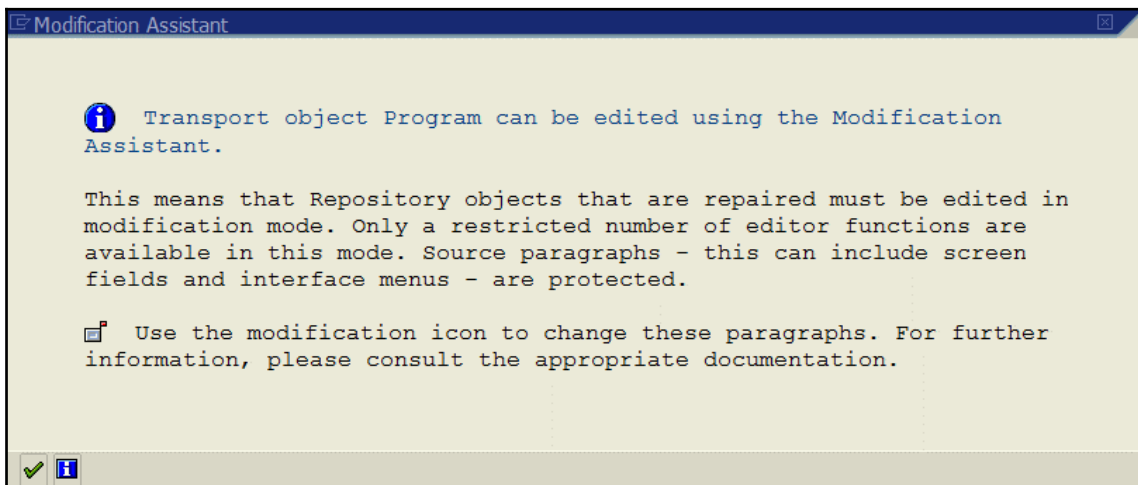
Perform registration in the SAP Support Portal

Enter Access Key

Object	R3TR	PROG	MV45AFZZ
SAP Release	750		
Access key			
Installation	0020713528		

Continue Display Information

Detailed description: This is a dialog box titled "Register Object" with a close button in the top right corner. The main heading is "Perform registration in the SAP Support Portal". Below this is a section titled "Enter Access Key" which contains four input fields. The first field is labeled "Object" and contains the text "R3TR", "PROG", and "MV45AFZZ". The second field is labeled "SAP Release" and contains "750". The third field is labeled "Access key" and is currently empty. The fourth field is labeled "Installation" and contains "0020713528". At the bottom of the dialog, there are three buttons: "Continue", "Display", and "Information".



Modification Assistant

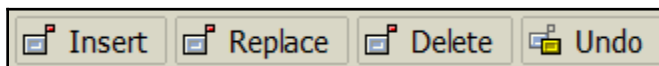
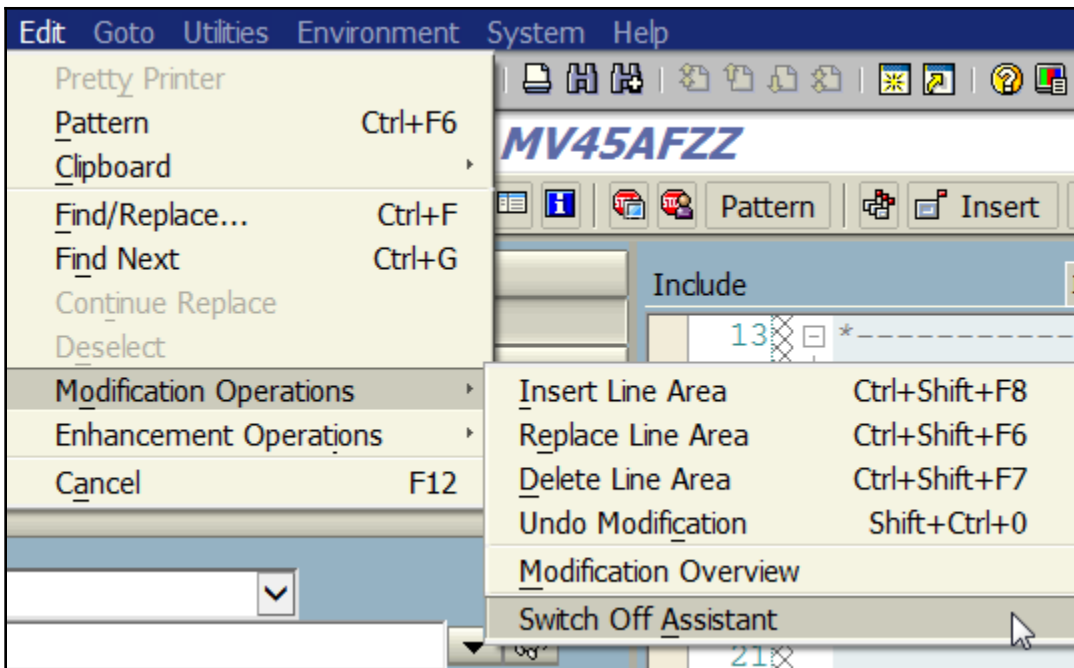
**i** Transport object Program can be edited using the Modification Assistant.

This means that Repository objects that are repaired must be edited in modification mode. Only a restricted number of editor functions are available in this mode. Source paragraphs - this can include screen fields and interface menus - are protected.

**i** Use the modification icon to change these paragraphs. For further information, please consult the appropriate documentation.

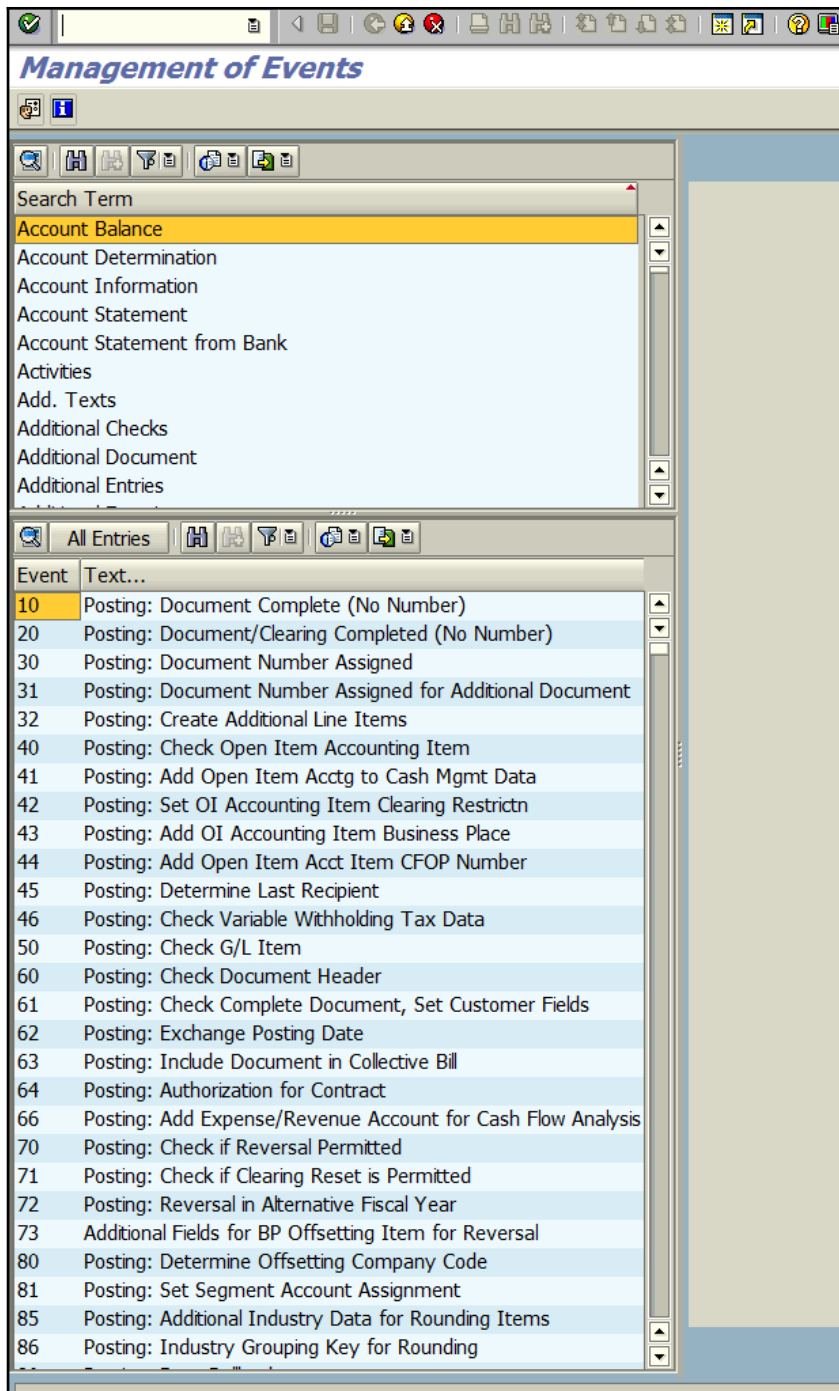
✓ i

Detailed description: This is a dialog box titled "Modification Assistant" with a close button in the top right corner. It contains an information icon (i) followed by the text "Transport object Program can be edited using the Modification Assistant." Below this is a paragraph explaining that repository objects that are repaired must be edited in modification mode, and that only a restricted number of editor functions are available. It also notes that source paragraphs, including screen fields and interface menus, are protected. A second information icon (i) is followed by the text "Use the modification icon to change these paragraphs. For further information, please consult the appropriate documentation." At the bottom left, there are two small icons: a green checkmark and an information icon (i).



```

FORM USEREXIT_FIELD_MODIFICATION.
*{   INSERT           HERK900424
*}   INSERT
    
```



Event 60 Posting: Check Document Header

Documentation Function Modules

### Functionality

The function modules called up at Event 0060 can carry out additional checks for a document header. The document header data is made available in transfer parameter **I\_FKKKO**.

### Notes

If you write function modules to carry out your own checks, use error messages only (MESSAGE E...) and NOT exceptions. If possible avoid setting warnings since these can be responded to only during individual processing online. When using background processing, warnings are treated as error messages.

### Programming Restrictions

To ensure the consistency of the system, note that you must **not** use the following language elements in events, unless they were explicitly declared to be allowed for the given event:

- COMMIT WORK
- ROLLBACK WORK
- CALL FUNCTION 'DEQUEUE ALL'
- Deletion of locks that you have not set yourself
- Implicit database commits triggered by RFC calls or by a WAIT statement

If you update additional data in an event and use the construction **PERFORM commit routine ON COMMIT**, note that:

- At the end of the **commit routine**, all internal tables from which data was updated must be initialized again to prevent a duplicate update in the next call.
- A **PERFORM rollback routine ON ROLLBACK** must also be called.  
In the **rollback routine**, initialize the same data that is initialized at the end of the **commit routine**.

If you want to carry out checks in an event, when you issue messages, note that warning messages cause background processing of the process to terminate. You should therefore avoid issuing warning messages if possible. At the most, issue warning messages if the value of **SY-BATCH** is initial.

Event 60 Posting: Check Document Header

Documentation Function Modules

Sample Function Modules

FM St...	Sample module	Add.functions
	FKK_SAMPLE_0060	<input checked="" type="checkbox"/>

Standard Function Modules

FM St...	No Standard module	No Cus.Mod


Installation-Specific Function Modules

FM St...	No Active module

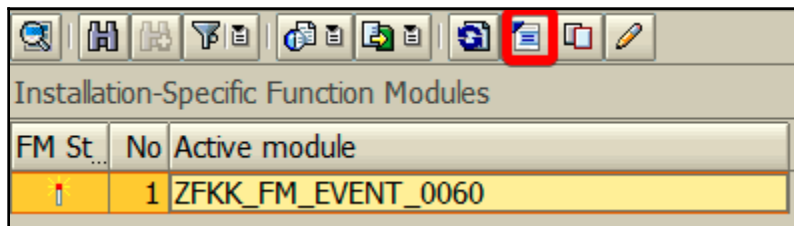
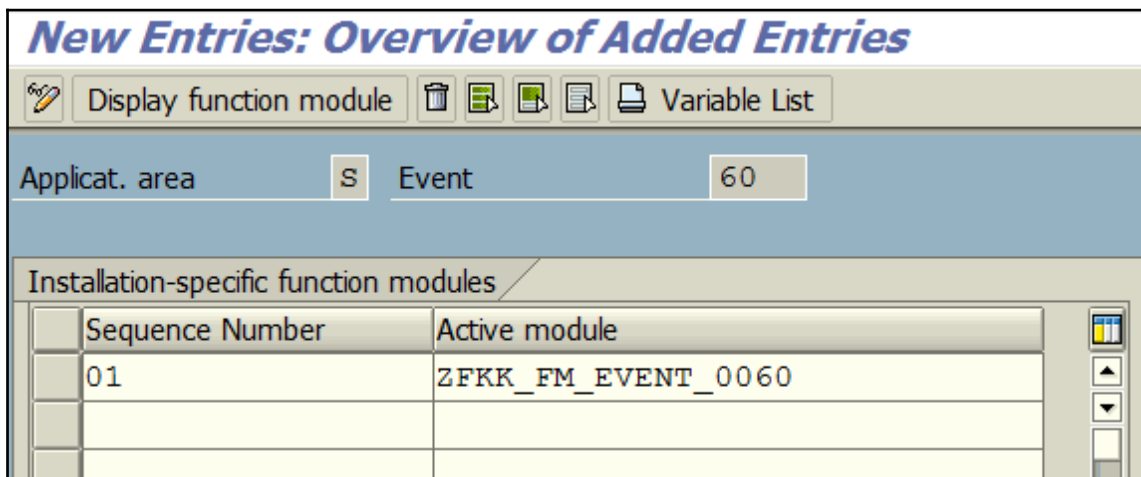
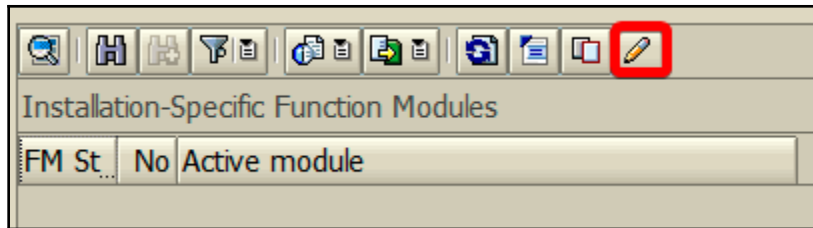
Sample Function Modules

FM St...	Sample module	Add.functions
	FKK_SAMPLE_0060	<input checked="" type="checkbox"/>

Copy Function Module

fr. Function module	FKK_SAMPLE_0060
To Function module	ZFKK_FM_EVENT_0060
Function group	ZFKK_FG_EVENTS 

Copy

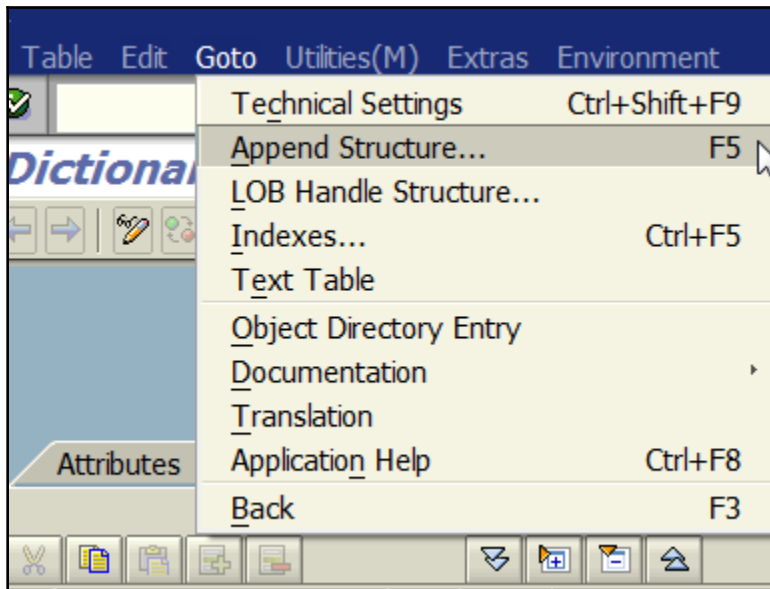


**Dictionary: Display Table**

Transp. Table: KNA1 Active  
 Short Description: General Data in Customer Master

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

Field	Key	Initial	Data element	Data Type	Length	Decimal	Short Description
LIFSD	<input type="checkbox"/>	<input type="checkbox"/>	LIFSD_X	CHAR	2	0	Central delivery block for the customer
LOCCO	<input type="checkbox"/>	<input type="checkbox"/>	LOCCO	CHAR	10	0	City Coordinates
LOEVM	<input type="checkbox"/>	<input type="checkbox"/>	LOEVM_X	CHAR	1	0	Central Deletion Flag for Master Record
NAME3	<input type="checkbox"/>	<input type="checkbox"/>	NAME3_GP	CHAR	35	0	Name 3
NAME4	<input type="checkbox"/>	<input type="checkbox"/>	NAME4_GP	CHAR	35	0	Name 4
NIELS	<input type="checkbox"/>	<input type="checkbox"/>	NIELS	CHAR	2	0	Nielsen ID
ORT02	<input type="checkbox"/>	<input type="checkbox"/>	ORT02_GP	CHAR	35	0	District
PFACH	<input type="checkbox"/>	<input type="checkbox"/>	PFACH	CHAR	10	0	PO Box
PSTL2	<input type="checkbox"/>	<input type="checkbox"/>	PSTL2	CHAR	10	0	P.O. Box Postal Code
COUNC	<input type="checkbox"/>	<input type="checkbox"/>	COUNC	CHAR	3	0	County Code
CITYC	<input type="checkbox"/>	<input type="checkbox"/>	CITYC	CHAR	4	0	City Code
RPMKR	<input type="checkbox"/>	<input type="checkbox"/>	RPMKR	CHAR	5	0	Regional Market
SPERR	<input type="checkbox"/>	<input type="checkbox"/>	SPERB_X	CHAR	1	0	Central posting block
SPRAS	<input type="checkbox"/>	<input type="checkbox"/>	SPRAS	LANG	1	0	Language Key
STCD1	<input type="checkbox"/>	<input type="checkbox"/>	STCD1	CHAR	16	0	Tax Number 1
STCD2	<input type="checkbox"/>	<input type="checkbox"/>	STCD2	CHAR	11	0	Tax Number 2



Create Append Structure for KNA1

Append Name

Append Structure  New(Revised)

Short Description

Attributes Components **Entry help/check** Currency/quantity fields

Predefined Type Show Appending Obj 1 / 0

Component	Typing Method	Component Type	Data Type	Length	Decimal ...	Short Des
NATIONALITY	1 Types	LAND1				

**Dictionary: Display Table**

Transp. Table  Active

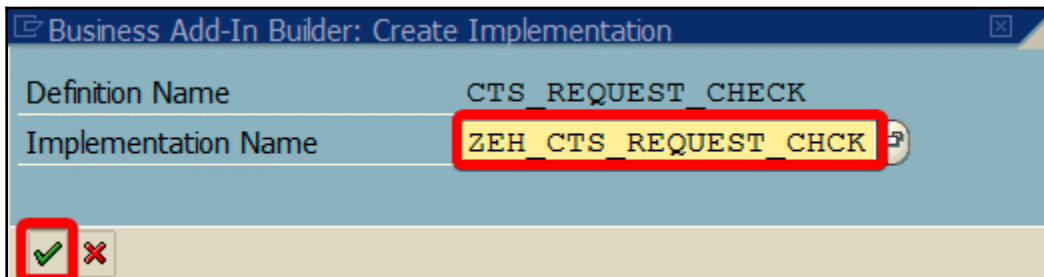
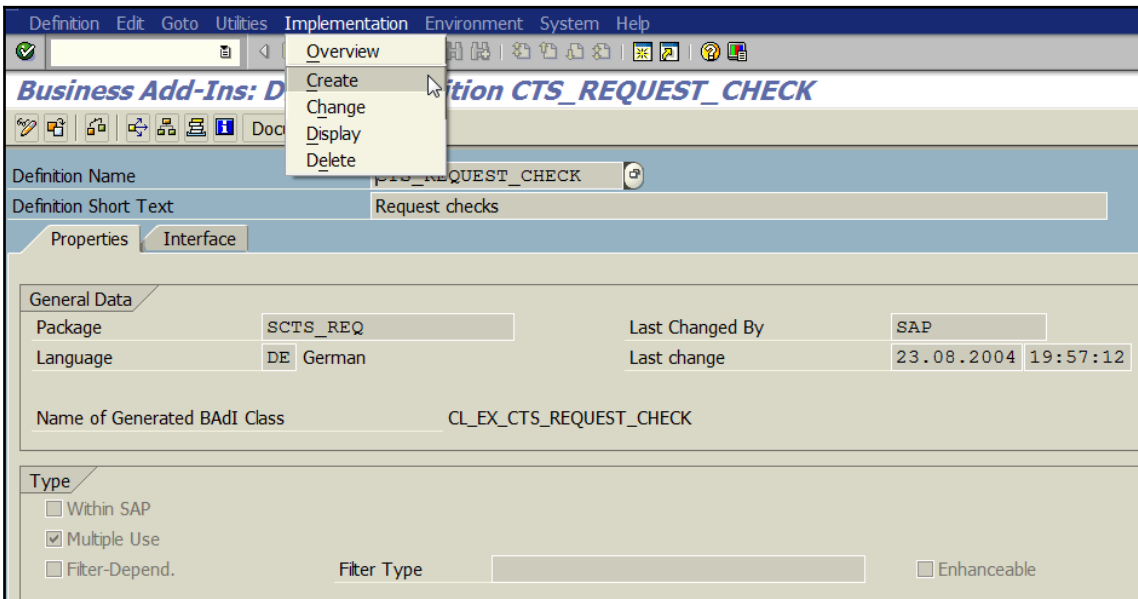
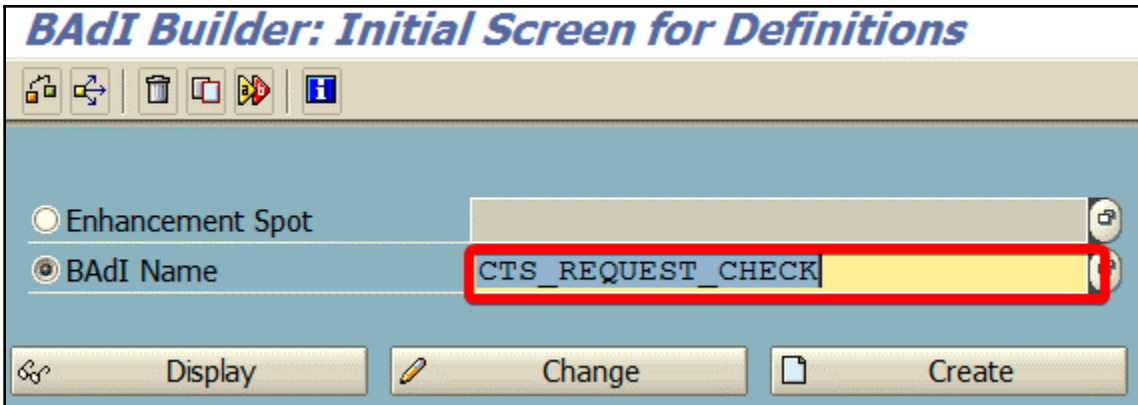
Short Description

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

Srch Help Predefined Type

Field	Key	Initial...	Data element	Data Type	Length	Decimal ...	Short Description
PS004	<input type="checkbox"/>	<input type="checkbox"/>	PS001	CHAR	50	0	Description
PS005	<input type="checkbox"/>	<input type="checkbox"/>	PS001	CHAR	50	0	Description
.APPEND	<input type="checkbox"/>	<input type="checkbox"/>	ZZCUSTOM	STRU	0	0	Nationality
NATIONALITY	<input type="checkbox"/>	<input type="checkbox"/>	LAND1	CHAR	3	0	Country Key





**Business Add-In Builder: Change Implementation ZEH\_CTS\_REQUEST\_CHK**

Definition Documenta Documentation

Implementation Name: ZEH\_CTS\_REQUEST\_CHK Inactive

Implementation Short Text: **Transport Request Name Check**

Definition Name: CTS\_REQUEST\_CHECK

Runtime Behavior: Implementation will not be called

Properties Interface

General Data

Package: [ ]

Language: EN English

Last Changed By: [ ]

Last change: [ ] 00:00:00

Type

Within SAP

Multiple Use

Filter-Depend.

```

25 | *-----
26 | ENHANCEMENT-POINT BAPI_SALESORDER_CREATEFROMD_G8 SPOTS ES_SAPL2032 STATIC.
27 | *$*$-Start: BAPI_SALESORDER_CREATEFROMD_G8-----$*$*
28 | ENHANCEMENT 3 MGV_GENERATED_BAPI_SALESORD002. "active version
29 | DATA: T_MGV_FNAMES1 LIKE MGVBAPIFNAMES OCCURS 0 WITH HEADER LINE.
30 | DATA: T_MGV_FNAMES2 LIKE MGVBAPIFNAMES OCCURS 0 WITH HEADER LINE.
31 | ENDENHANCEMENT.
32 | *$*$-End: BAPI_SALESORDER_CREATEFROMD_G8-----$*$*
33 |
34 | ENHANCEMENT-POINT BAPI_SALESORDER_CREATEFROMD_G6 SPOTS ES_SAPL2032.
35 | *$*$-Start: BAPI_SALESORDER_CREATEFROMD_G6-----$*$*
36 | ENHANCEMENT 1 MGV_GENERATED_BAPI_SALESORD002. "active version
37 | *(BAPI Begin) generation http://intranet.sap.com/materialversion

```

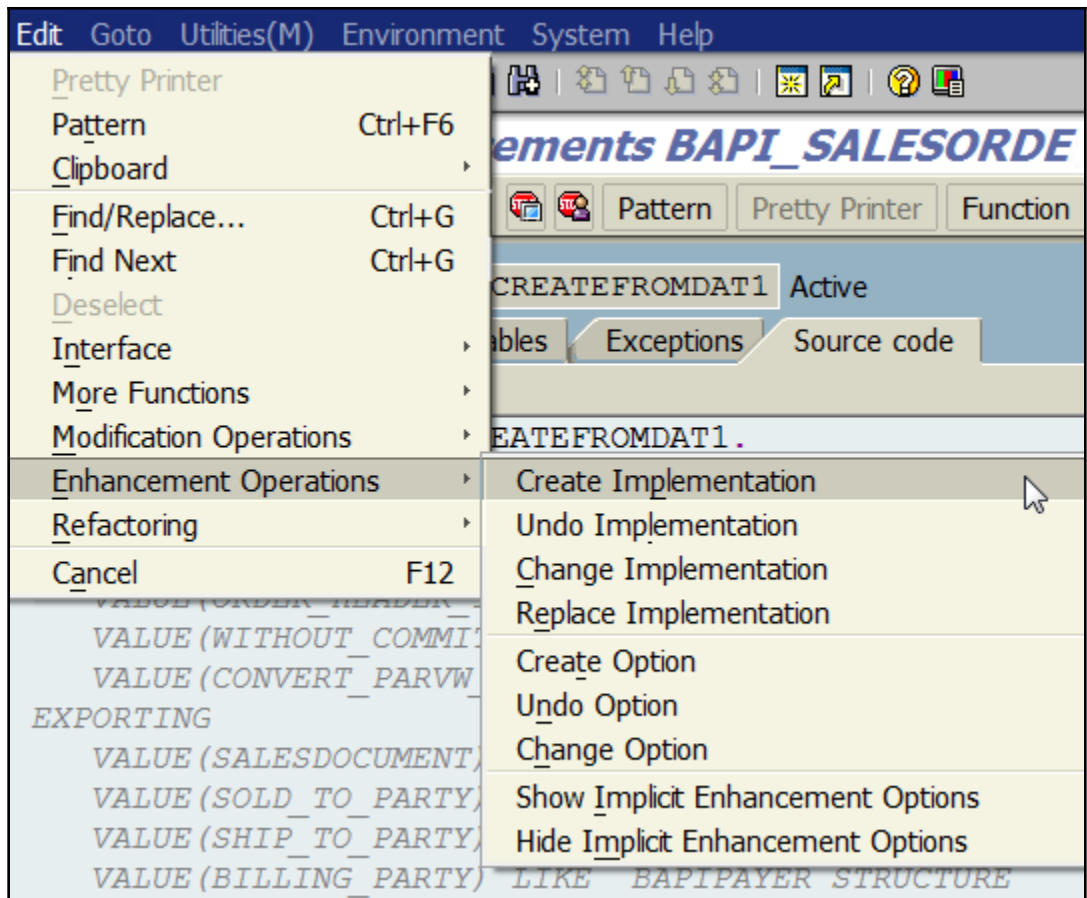
**Function Builder: Display BAPI\_SALESORDER**

Pattern

```

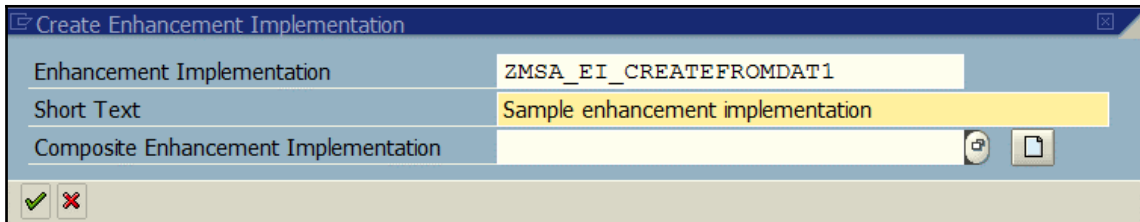
ENHANCEMENT-POINT BAPI_SALESORDER_CREATEFROMD_G8 SPOTS ES_SAPL2032 STATIC.

```



Select or Create Enhancement Implementation

Enhancement Implementation	Package	Software Component	Beschreibung	Composte Enhancement
MGV_GENERATED_BAPI_SALESORD000	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
MGV_GENERATED_BAPI_SALESORD001	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
MGV_GENERATED_BAPI_SALESORD002	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
MGV_GENERATED_BAPI_SALESORD003	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
MGV_GENERATED_BAPI_SALESORD004	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
MGV_GENERATED_BAPI_SALESORD005	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
MGV_GENERATED_BAPI_SALESORD006	MGV_GENERATED	ECC-DIMP		MGV_GENERATED_SAPL2
/NFM/SD_BAPI_SALESORDER_CREA_1	/NFM/SD	ECC-DIMP	/nfm/sd_BAPI_SALESORDER_CREA_1	/SAPMP/EC
/NFM/SD_BAPI_SALES_ORDER_01	/NFM/SD	ECC-DIMP	/nfm/sd_bapi_sales_order_01	/SAPMP/EC
FSH_BAPI_SALESORDER_CREATE	FSH_SD_SFW	EA-RETAIL	Enhancement implementation for BAPI Sales o...	
FSH_SALES_ITEM_ENH	FSH_SD_SFW	EA-RETAIL	Enhancement in sales intenal use	



```

ENHANCEMENT 1 ZMSA_EI_CREATEFROMDAT1. "inactive version
ENDENHANCEMENT.
    
```



**Function Builder: Display BAPI\_ACC\_DOCUMENT\_POST**

Function module: **BAPI\_ACC\_DOCUMENT\_POST** Active

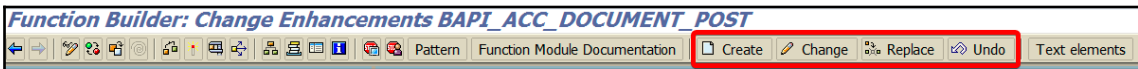
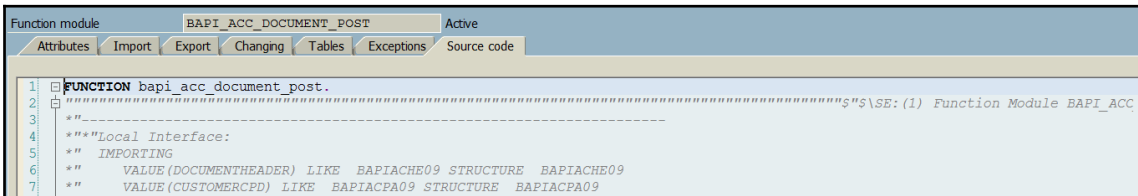
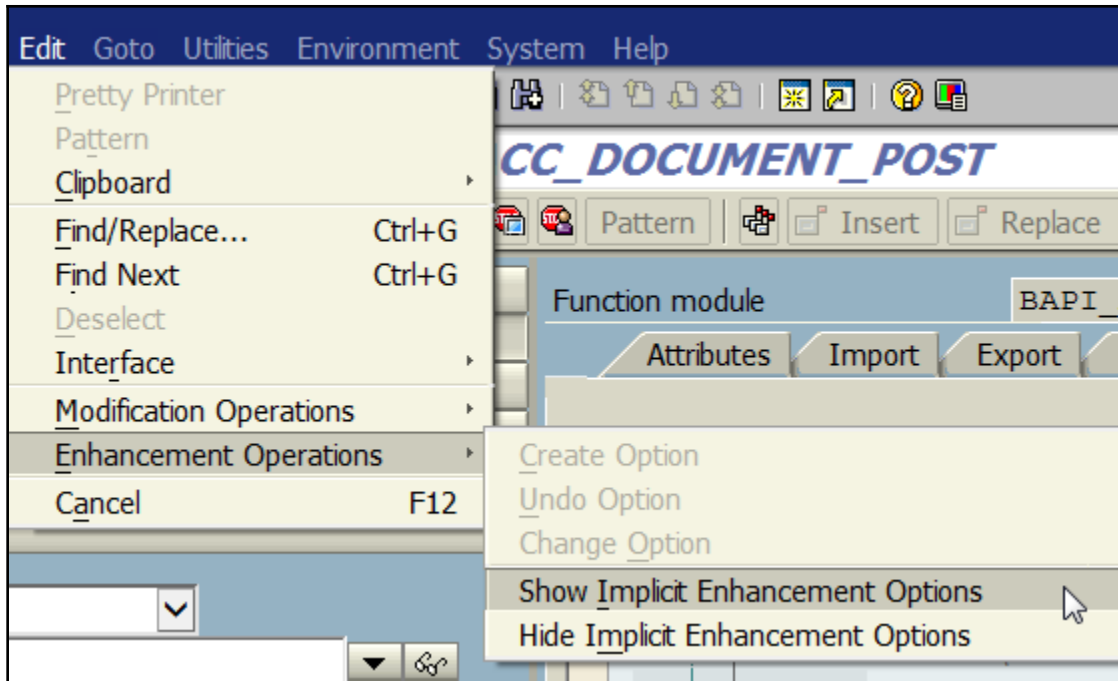
Attributes Import Export Changing Tables Exceptions Source code

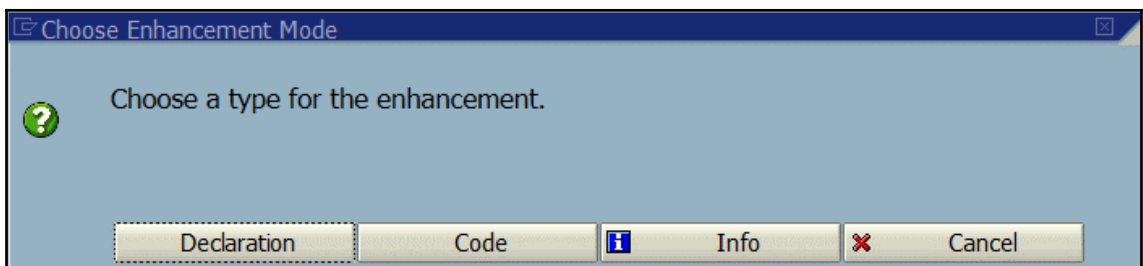
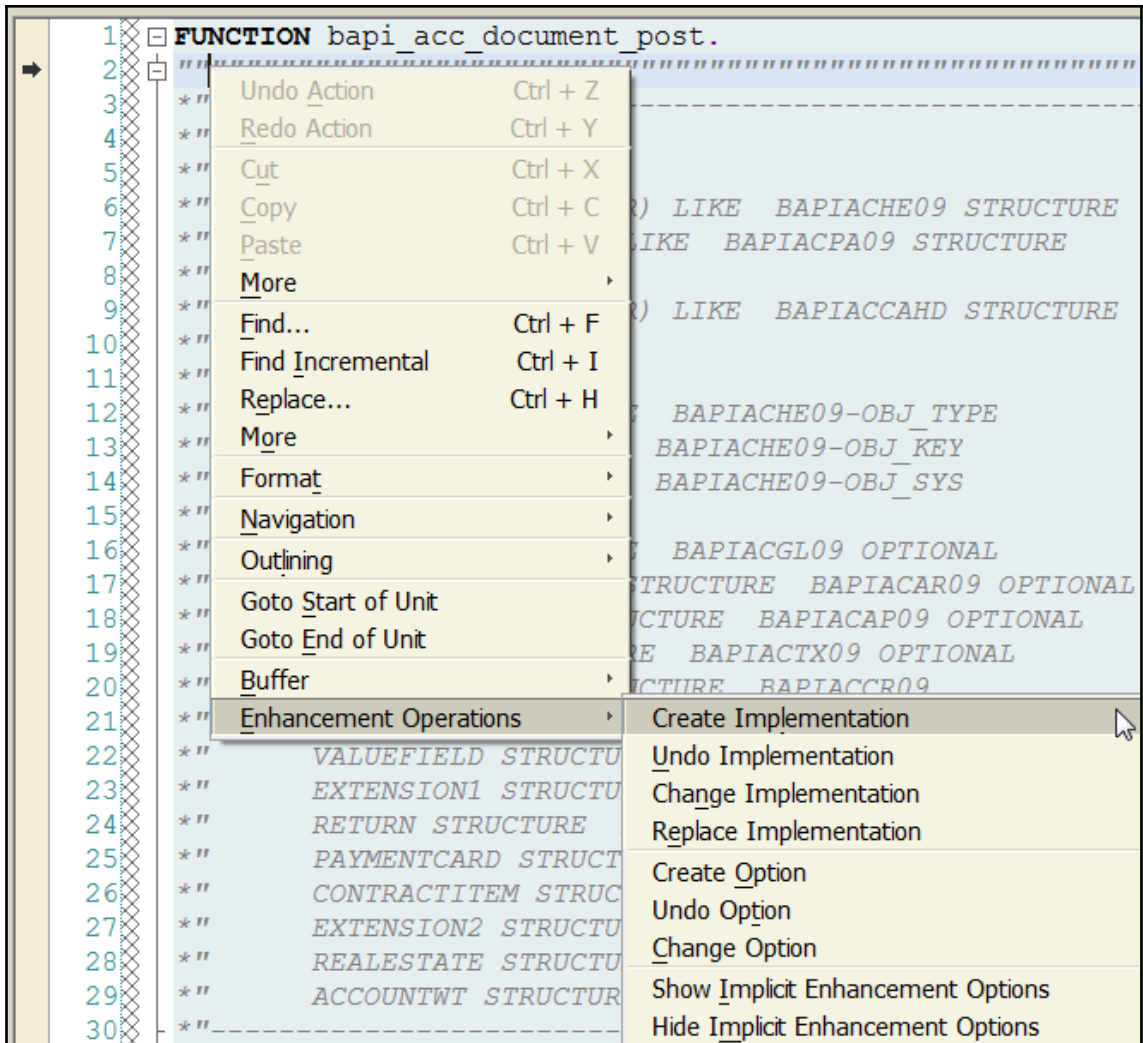
```

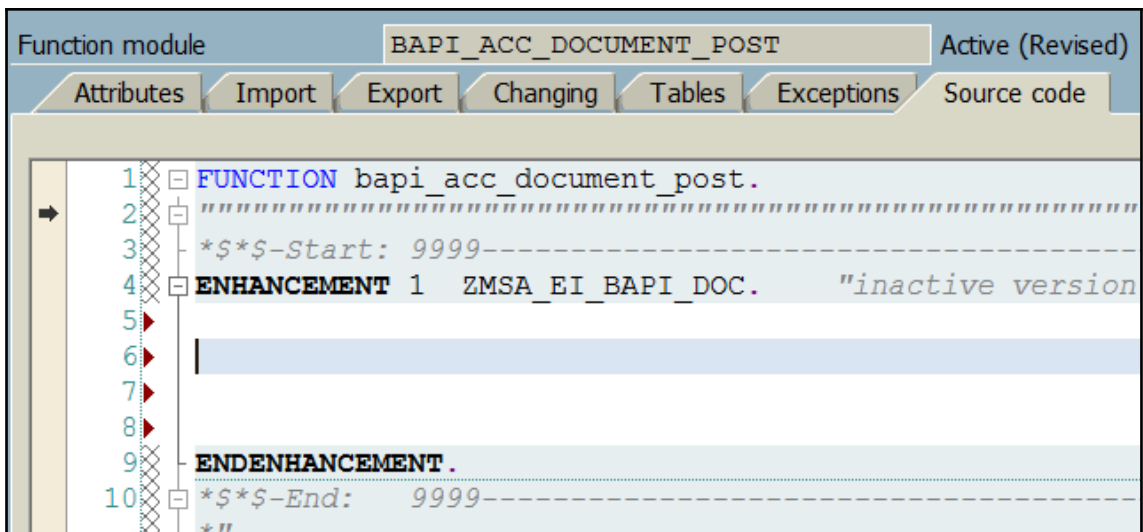
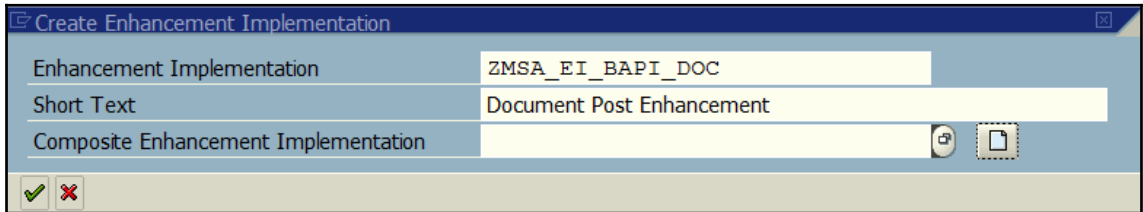
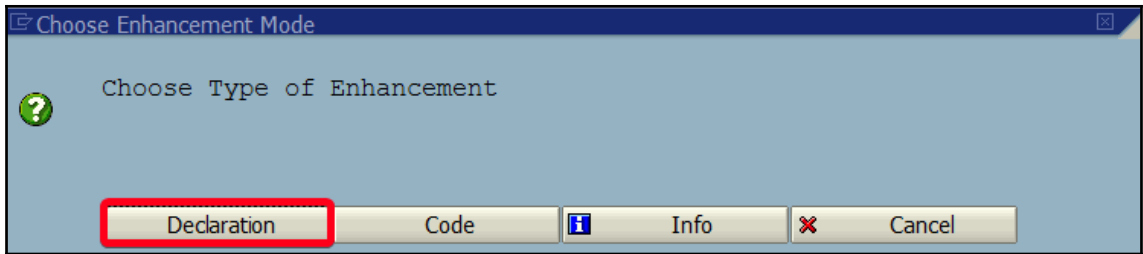
1 FUNCTION bapi_acc_document_post.
2 *--
3 *--"Local Interface:
4 IMPORTING
5 VALUE(DOCUMENTHEADER) LIKE BAPIACHE09 STRUCTURE BAPIACHE09
6 VALUE(CUSTOMERCPD) LIKE BAPIACPA09 STRUCTURE BAPIACPA09
7 OPTIONAL
8 VALUE(CONTRACTHEADER) LIKE BAPIACCAHD STRUCTURE BAPIACCAHD
9 OPTIONAL
10 EXPORTING
11 VALUE(OBJ_TYPE) LIKE BAPIACHE09-OBJ_TYPE
12 VALUE(OBJ_KEY) LIKE BAPIACHE09-OBJ_KEY
13 VALUE(OBJ_SYS) LIKE BAPIACHE09-OBJ_SYS
14 TABLES
15 ACCOUNTGL STRUCTURE BAPIACGL09 OPTIONAL
16 ACCOUNTRECEIVABLE STRUCTURE BAPIACAR09 OPTIONAL
17 ACCOUNTPAYABLE STRUCTURE BAPIACAP09 OPTIONAL
18 ACCOUNTTAX STRUCTURE BAPIACTX09 OPTIONAL
19 CURRENCYAMOUNT STRUCTURE BAPIACCR09
20 CRITERIA STRUCTURE BAPIACKEC9 OPTIONAL
21 VALUEFIELD STRUCTURE BAPIACKEV9 OPTIONAL
22 EXTENSION1 STRUCTURE BAPIACEXTC OPTIONAL
23 RETURN STRUCTURE BAPIRET2
24 PAYMENTCARD STRUCTURE BAPIACPC09 OPTIONAL
25 CONTRACTITEM STRUCTURE BAPIACCAIT OPTIONAL
26 EXTENSION2 STRUCTURE BAPIPAREX OPTIONAL
27 REALESTATE STRUCTURE BAPIACRE09 OPTIONAL
28 ACCOUNTWT STRUCTURE BAPIACWT09 OPTIONAL
29 *--
    
```

Object Name: ACC9

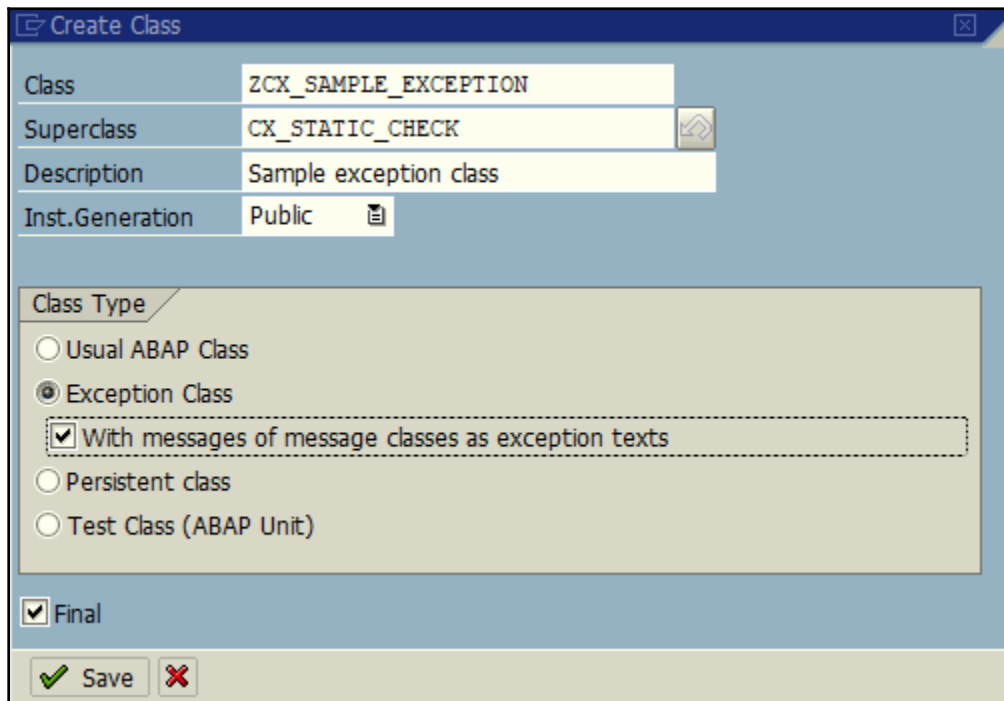
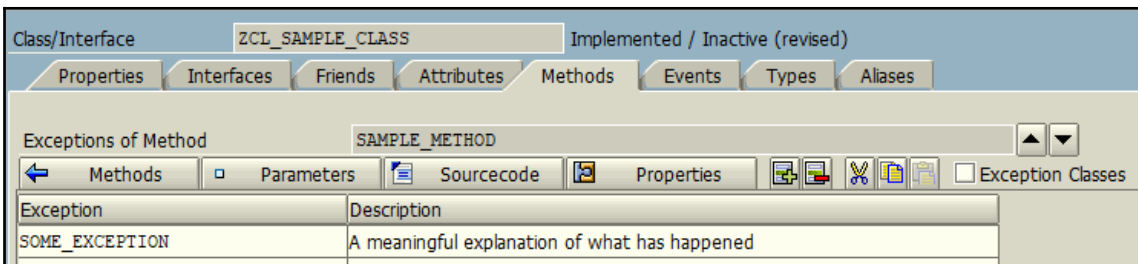
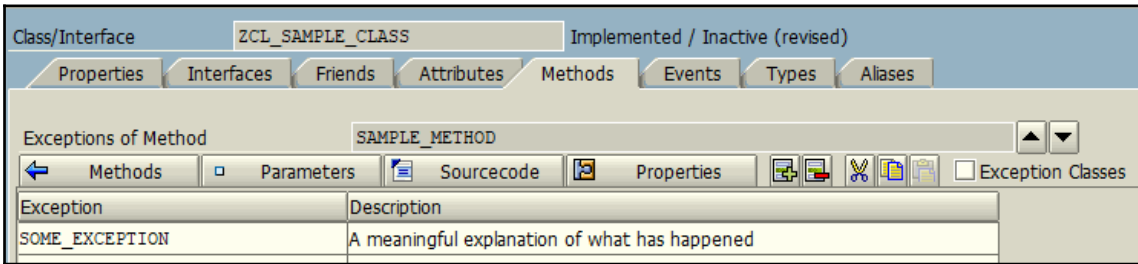
- Function Modules
  - BAPI\_ACC\_DOCUMENT\_POST







# Chapter 11: Handling Exceptions in ABAP







Class/Interface **ZCX\_SAMPLE\_EXCEPTION** Implemented / Inactive

Properties Interfaces Friends Attributes Texts Methods Events Types Aliases


Properties  Filter






Interface	Abstract	Final	Modele...	Description
<a href="#">IF_MESSAGE</a>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Part of Interface for Accessing Message Texts
<a href="#">IF_SERIALIZABLE_OBJECT</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Serializable Object
<a href="#">IF_T100_DYN_MSG</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dynamic Access to T100 Texts (with Attributes)
<a href="#">IF_T100_MESSAGE</a>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Interface for Accessing T100 Texts

### Checkpoints that Can Be Activated


 







**Checkpoint Group**

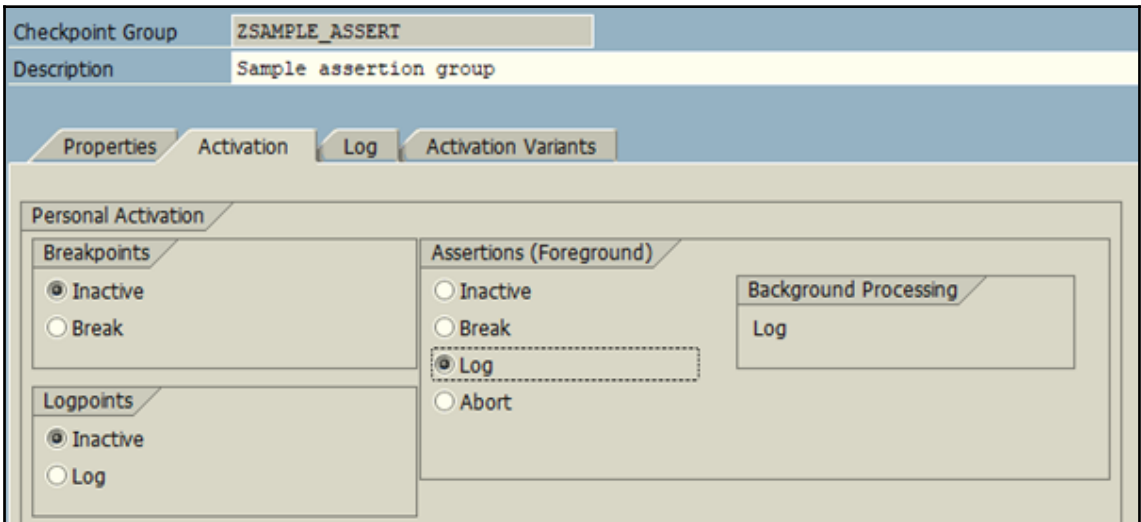
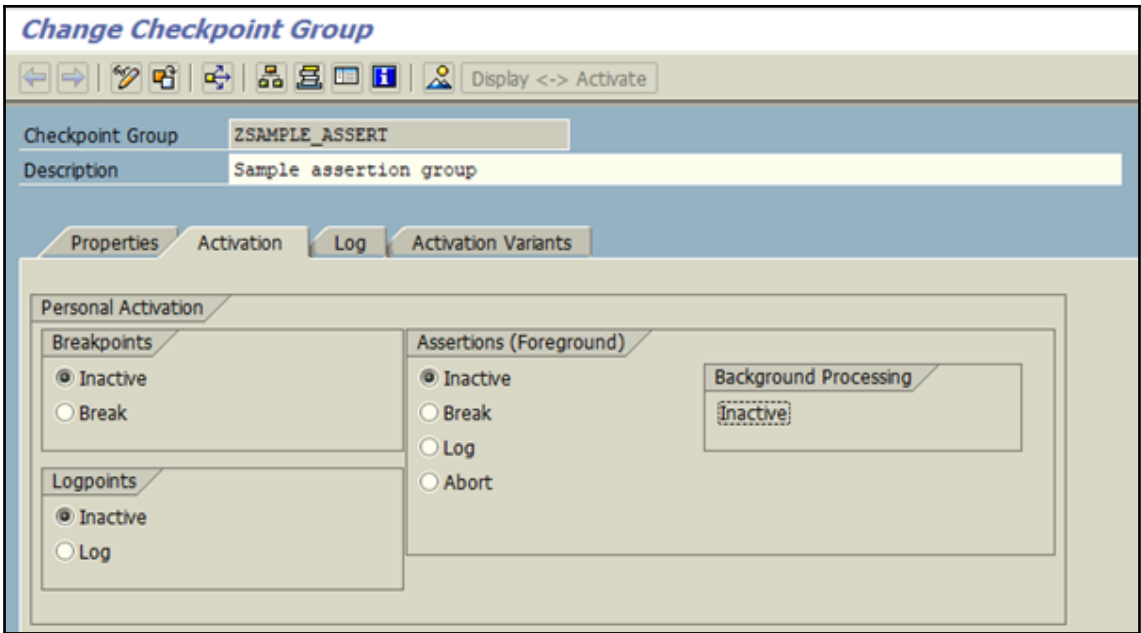
Name **ZSAMPLE\_ASSERT** 

**Activation Variant**

Name  \_\_\_\_\_ From User **DPAC00**



Properties   Activation   Log   Activation Variants

Hierarchy View

Group/SUBKEY/Program/Procedure       Group/Program/Procedure/SUBKEY

ID/SUBKEY/Program/Procedure	Date	Time	Counter
▶  I:ZSAMPLE_ASSERT			1

Error Information

Frequency      1      30.06.2018      Last Time      21:10:00

SUBKEY      date assertion

FIELDS

Fld Name	Field Value	Attributes
SY-DATUM	20180630	
SY-UZEIT	211000	

### ABAP Runtime Errors - All Clients

---

**Parameters**

**Standard**

<input type="button" value="Today"/>	0	Runtime Errors	
<input type="button" value="Yesterday"/>	0	Runtime Errors	

---

**Own selection**

Date	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Time	<input type="text" value="00:00:00"/>	to	<input type="text" value="00:00:00"/>	<input type="button" value="⏪"/>
Host	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Work Process Index	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
User	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Client	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
To be stored	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Runtime Error	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Terminated Program	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Exception	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
Transaction ID	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
EPP Full Context ID	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>
EPP Connection ID	<input type="text"/>	to	<input type="text"/>	<input type="button" value="⏪"/>

---

These files were investigated for each runtime error:

- With Short Text of Runtime Error
- Corresponding Application Component (Long Runtime)
- Use old dump analysis

**What happened?**

Error in the ABAP Application Program

The current ABAP program "!TESTDUMP" had to be terminated because it has come across a statement that unfortunately cannot be executed.

**What can you do?**

Note down which actions and inputs caused the error.

To process the problem further, contact your SAP system administrator.

Using Transaction ST22 for ABAP Dump Analysis, you can look at and manage termination messages, and you can also keep them for a long time.

**Short text**

Division by 0 (type I)

**Error analysis**

An exception occurred that is explained in detail below.

The exception, which is assigned to class 'CX\_SY\_ZERODIVIDE', was not caught and therefore caused a runtime error.

The reason for the exception is:

In the current program "!TESTDUMP", an arithmetic operation ('DIVIDE', '/', 'DIV', or 'MOD') attempted to use operands of type I to divide by 0.

Contents of system fields	
Name	Val.
SY-SUBRC	0
SY-INDEX	0
SY-TABIX	1
SY-DBCNT	0
SY-FDPOS	0
SY-LSIND	0
SY-PAGNO	0
SY-LINNO	1
SY-COLNO	1
SY-PFKEY	
SY-UCOMM	
SY-TITLE	
SY-MSGTY	
SY-MSGID	
SY-MSGNO	000
SY-MSGV1	
SY-MSGV2	
SY-MSGV3	
SY-MSGV4	
SY-MODNO	0
SY-DATUM	20190324
SY-UZEIT	171213
SY-XPROG	RSDBRUNT
SY-XFORM	%_INIT_PBO_FIRST

#### How to correct the error

If the error occurred in your own ABAP program or in an SAP program you modified, try to remove the error.

If the error occurs in a non-modified SAP program, you may be able to find an interim solution in an SAP Note.

If you have access to SAP Notes, carry out a search with the following keywords:

"COMPUTE\_INT\_ZERODIVIDE" "CX\_SY\_ZERODIVIDE"  
"ZTESTDUMP" or "ZTESTDUMP"  
"START-OF-SELECTION"

If you cannot solve the problem yourself and want to send an error notification to SAP, include the following information:

1. The description of the current problem (short dump)

To save the description, choose "System->List->Save->Local File (Unconverted)".

2. Corresponding system log

Display the system log by calling transaction SM21.

Restrict the time interval to 10 minutes before and five minutes after the short dump. Then choose "System->List->Save->Local File (Unconverted)".

3. If the problem occurs in a program of your own or a modified SAP program: The source code of the program

In the editor, choose "Utilities->More Utilities->Upload/Download->Download".

4. Details about the conditions under which the error occurred or which actions and input led to the error.

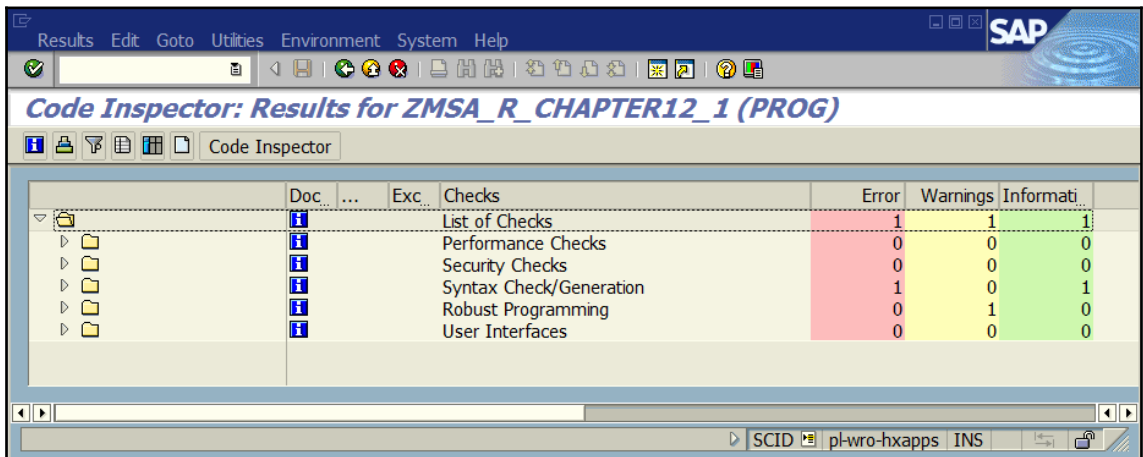
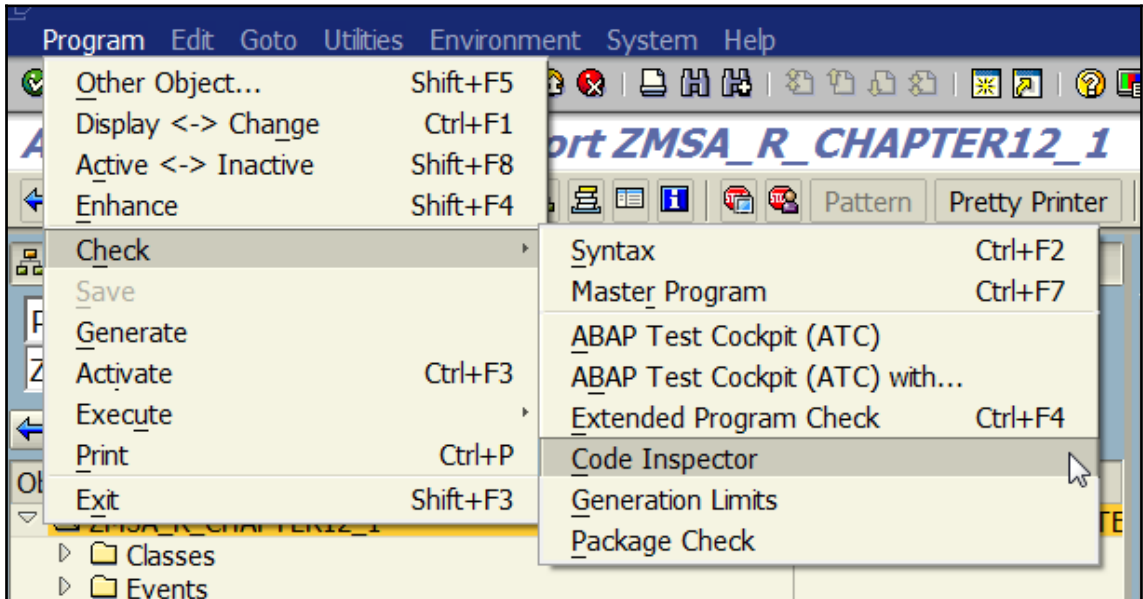
Source Code Extract	
Line	SourceCde
1	*\$-----
2	*\$ Report ZTESTDUMP
3	*\$
4	*\$-----
5	*\$
6	*\$
7	*\$-----
8	
9	REPORT ztestdump.
10	
11	DATA : lv_count TYPE i VALUE 4,
12	lv_div TYPE i,
13	lv_denom TYPE i VALUE 0.
14	
>>>>	lv_div = lv_count / lv_denom.

**Internal notes**

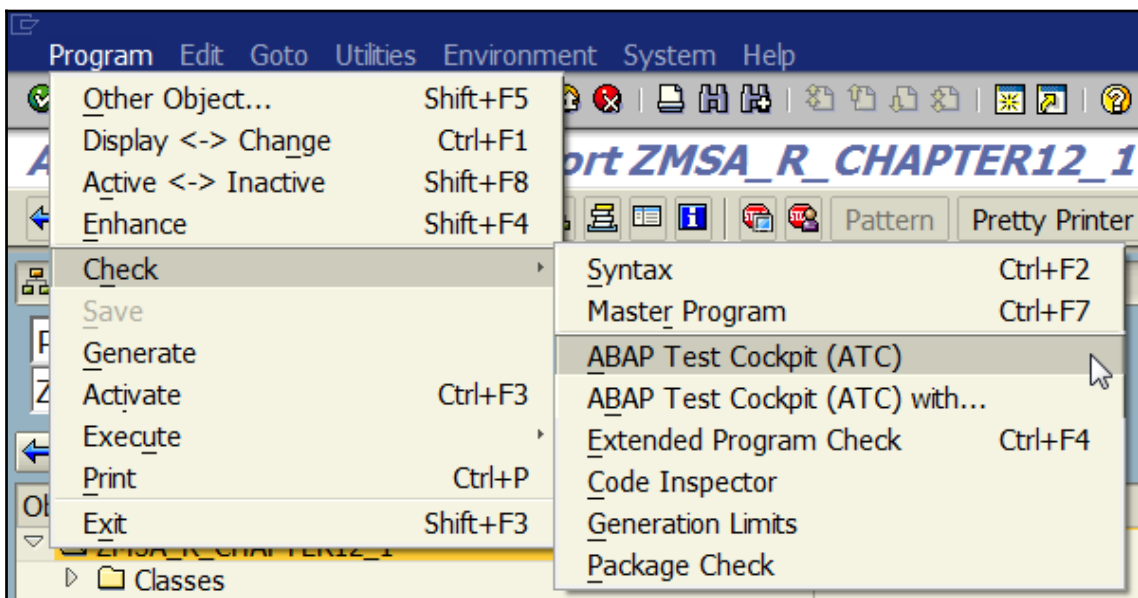
The termination was triggered in function "AbCaliDivr" of the SAP kernel, in line 5006 of the module "//bas/722\_REL/src/krn/runt/abcalc.c#2".  
The internal operation just processed is "ccqi".  
Internal mode was started at 20190331145850.



# Chapter 12: Testing ABAP programs

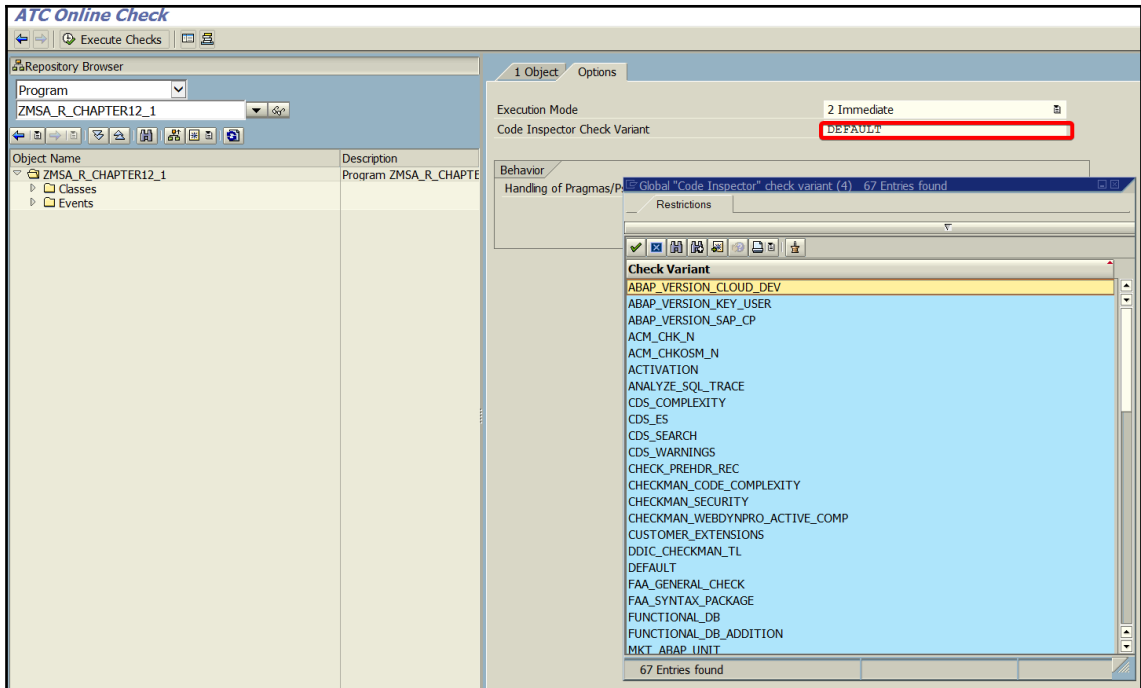


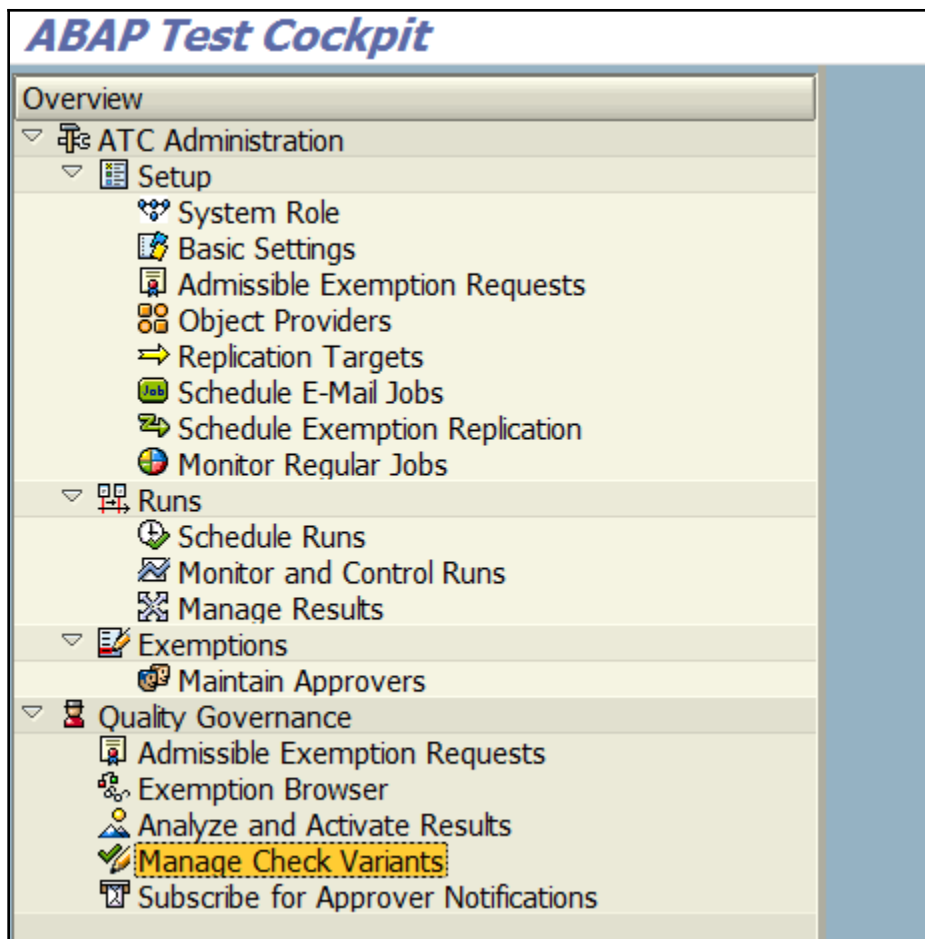
	Doc...	Exc...	Checks	Error	Warnings	Informati
▼			List of Checks	1	1	1
▼			Performance Checks	0	0	0
▼			Security Checks	0	0	0
▼			Syntax Check/Generation	1	0	1
▼			Extended Program Check (SLIN)	1	0	1
▼			Errors	1	0	0
▼			Message Code 0103 ==> In PERFORM or CALL FUNCTION "TH_POPUP", th... parameter "LV_MESSAGE" is incompatible with the formal parameter "MESSAGE". Internal message code: MESSAGE GUQ Caution: SLIN respects catches of the runtime error... CX_SY_DYN_CALL_ILLEGAL_TYPE.	1	0	0
▼			Information	0	0	1
▼			Robust Programming	0	1	0
▼			User Interfaces	0	0	0




The screenshot shows the SAP ATC interface for program ZMSA\_R\_CHAPTER12\_1. The findings table is as follows:








Pro	Check Title	Check Message	Object Name	Obj.	Ex	Contact Person	R
1	Extended Program Check (SLI)	Formal parameter incompatible with actual parameter	ZMSA_R_CHAPTER12_1	PROG		PGRZESKO	S
2	Tenuous use of FOR ALL ENT	Possible use of ... without prior content validation	ZMSA_R_CHAPTER12_1	PROG		PGRZESKO	S
3	Extended Program Check (SLI)	Text element missing in a character string	ZMSA_R_CHAPTER12_1	PROG		PGRZESKO	S











Inspection

Name  \_\_\_\_\_ Vers. \_\_\_\_\_


      






Object Set

Name  \_\_\_\_\_ Vers. \_\_\_\_\_


Check Variant

Name  DEFAULT \_\_\_\_\_


    

Copy



Person Responsible PGRZESKO

Check Variant  DEFAULT


Copy To








New Check Variant  ZEVENBETTERDEFAULT

Description Template Variant for Mass Runs - Version 7.51


Inspection






Name   Vers.

---


Object Set






Name   Vers.

---


Check Variant

Name  ZEVENBETTERDEFAULT


    

Copy



Person Responsible

Check Variant 

Copy To

New Check Variant 

Description

Check Variant: ZEVENBETTERDEFAULT Person Respons.: PGRZESKO  
 Changed On: 17.11.2018 Last Changed By: PGRZESKO  
 Description: Template Variant for Mass Runs - Version 7.51  
 Public  Extract-based  RFC-based

Checks to Execute

In reference check system  
 Locally available checks

Selection	Doc...	Attri...	RFC...	Extr...	Checks
<input checked="" type="checkbox"/>					List of Checks
<input type="checkbox"/>					General Checks
<input type="checkbox"/>					Cloud Readiness
<input type="checkbox"/>					Test for restricted language scope (ABAP version)
<input type="checkbox"/>					Whitelist Check
<input checked="" type="checkbox"/>					Performance Checks
<input checked="" type="checkbox"/>					Security Checks
<input checked="" type="checkbox"/>					Syntax Check/Generation
<input checked="" type="checkbox"/>					Robust Programming
<input checked="" type="checkbox"/>					Programming Conventions
<input checked="" type="checkbox"/>					Naming Conventions
<input type="checkbox"/>					Extended Naming Conventions for Programs
<input type="checkbox"/>					Check Pretty Print State
<input type="checkbox"/>					ABAP Unit Test Conventions
<input type="checkbox"/>					Extended Check for ABAP Doc Comments
<input type="checkbox"/>					S/4HANA Readiness
<input type="checkbox"/>					Metrics and Statistics
<input type="checkbox"/>					Dynamic Tests
<input checked="" type="checkbox"/>					User Interfaces
<input type="checkbox"/>					Search Funct.
<input type="checkbox"/>					CDS Metadata Extensions
<input type="checkbox"/>					Application Checks
<input type="checkbox"/>					Internal Performance Tests
<input type="checkbox"/>					GW: Gateway Checks
<input type="checkbox"/>					Intern. Tests
<input type="checkbox"/>					Proxy Checks

Naming Conventions for ABAP Objects

Program Global			
DEFINE		to	
TYPES	<input checked="" type="checkbox"/> T_*	to	
CONSTANTS	<input checked="" type="checkbox"/> C_*	to	
DATA	<input checked="" type="checkbox"/> L_*	to	
FIELD-SYMBOLS	<input checked="" type="checkbox"/> <L_*	to	
PARAMETER(S)		to	
SELECT-OPTIONS		to	

Proced.Local			
TYPES	<input checked="" type="checkbox"/> T_*	to	
CONSTANTS	<input checked="" type="checkbox"/> C_*	to	
DATA	<input checked="" type="checkbox"/> L_*	to	
FIELD-SYMBOLS	<input checked="" type="checkbox"/> <L_*	to	

Global Classes/Interfaces			
CLASS	<input checked="" type="checkbox"/> CL_*	to	
INTERFACE	<input checked="" type="checkbox"/> IF_*	to	
TYPE	<input checked="" type="checkbox"/> T_*	to	
CONSTANTS	<input checked="" type="checkbox"/> C_*	to	
DATA	<input checked="" type="checkbox"/> L_*	to	
CLASS-DATA	<input checked="" type="checkbox"/> L_*	to	
EVENTS	<input checked="" type="checkbox"/> L_*	to	
METHODS	<input checked="" type="checkbox"/> L_*	to	

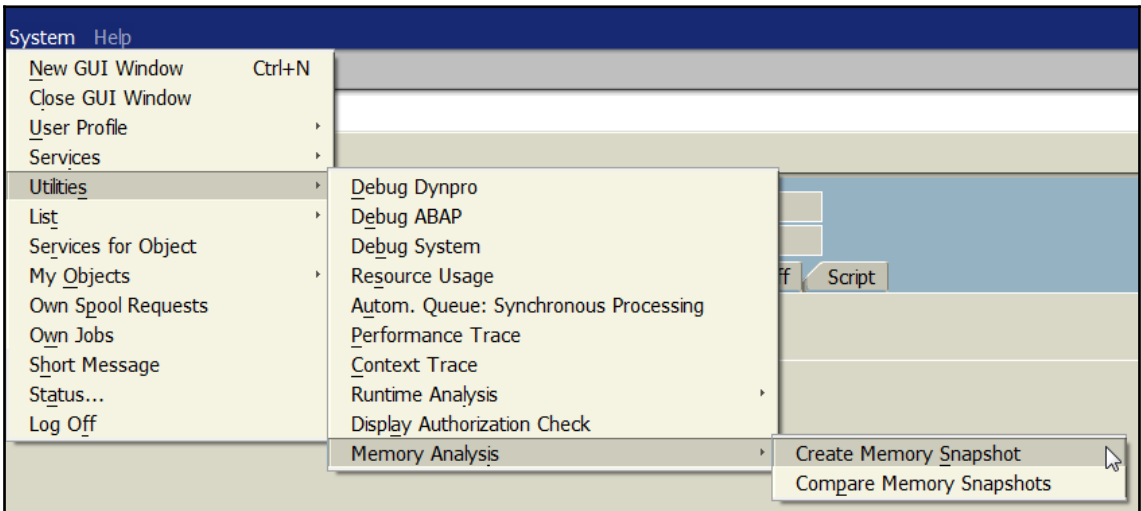
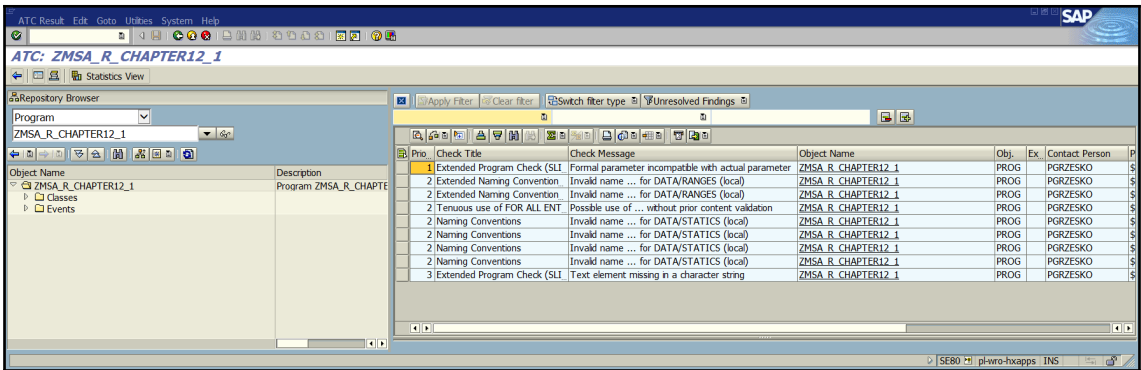
  

Local Classes/Interfaces			
CLASS	<input checked="" type="checkbox"/> LCL_*	to	
INTERFACE	<input checked="" type="checkbox"/> LIF_*	to	
TYPES	<input checked="" type="checkbox"/> T_*	to	
CONSTANTS	<input checked="" type="checkbox"/> C_*	to	
DATA	<input checked="" type="checkbox"/> L_*	to	
CLASS-DATA	<input checked="" type="checkbox"/> L_*	to	
EVENTS	<input checked="" type="checkbox"/> L_*	to	
METHODS	<input checked="" type="checkbox"/> L_*	to	

Method Parameters			
IMPORTING	<input checked="" type="checkbox"/> P_*	to	
EXPORTING	<input checked="" type="checkbox"/> P_*	to	
CHANGING	<input checked="" type="checkbox"/> P_*	to	
RETURNING	<input checked="" type="checkbox"/> P_*	to	





# Graphic Bundle

**Memory Inspector - Memory Use Analysis**

Memory Snapshots Navigation Change Number of Hits

File Name	Date	Time	User	Program	Transaction	System	Client	Host	Operating Sy.	File Size
/usr/sap/HEC/D20/data/abDbgMemory_003_0008	17.11.2018	23:29:31	PGRZEKSO	ZMSA_R_CHAPTE...	WB_NEW_W... HEC	800	pi-wro-hxapps	Linux		28.258
/usr/sap/HEC/D20/data/abDbgMemory_002_0006	17.11.2018	23:29:09	PGRZEKSO	ZMSA_R_CHAPTE...	WB_NEW_W... HEC	800	pi-wro-hxapps	Linux		28.245

Memory Snapshot: (t\_0) Display Limit: Tables 100

Memory Snapshot / View	Filter	Number	Memory Object	Rank	Lines (Allocated)	Lines (Used)	Usage - Lines (%)	Bound (Allocated)	Bound (Used)
Tables									
			[450x1022] :GT_USR	1	452	450	100	463.144	460.404
			[24x40] :CURRENT_SCR-EXCL	2	29	24	83	1.592	1.180
			[8x20] :SPECIAL_CHARS	3	12	8	67	712	462
			[1x448] :SCREEN_PROGSS[]	4	5	1	20	2.464	544
			[1x272] :RESTORE[]	5	5	1	20	1.480	368
			[1x16] :M_CONSUMERS	6	4	1	25	184	112
			[1x16] :CL_GUL_PROPS_CONSUMERL	7	4	1	25	184	112
			[1x492] :	8	1	1	100	616	588

Memory Snapshot (t\_0)

Memory Snapshot / View

Dropdown menu options:

- (t\_0)
- (t\_1)
- (t\_1 - t\_0)

Memory Snapshot: (t\_1 - t\_0) Display Limit: Tables 100

Memory Snapshot / View	Filter	Number	Memory Object	Rank	Lines (Allocated)	Lines (Used)	Usage - Lines (%)	Bound (Allocated)	Bound (Used)
Tables									
			[1639x1022] :GT_USR	1	644(+ 560)	639(+ 568)	99(+ 14)	659.720(+ 573.536)	653.626(+ 580.872)

```
Report ZMSA_R_CHAPTER12_3 Active
19 CLASS-METHODS main.
20 ENDCLASS.
21
22 CLASS lcl_demo IMPLEMENTATION.
23 METHOD main.
24 DATA: lt_usr TYPE TABLE OF usr02.
25 DATA: ls_usr TYPE usr02.
26 DATA: lv_monday TYPE datum.
27 DATA: lv_sunday TYPE datum.
28
29 SELECT * FROM usr41 INNER JOIN usr02 ON usr41~bname = usr02~bname
30 APPENDING CORRESPONDING FIELDS OF TABLE lt_usr.
31
32 LOOP AT lt_usr INTO ls_usr.
33 IF ls_usr-bname <> sy-uname.
```

Desktop 1 Desktop 2 Desktop 3 Standard Structures Tables Objects Detail Data Explorer Break./Watchpoints Diff Script

Script Trace Files

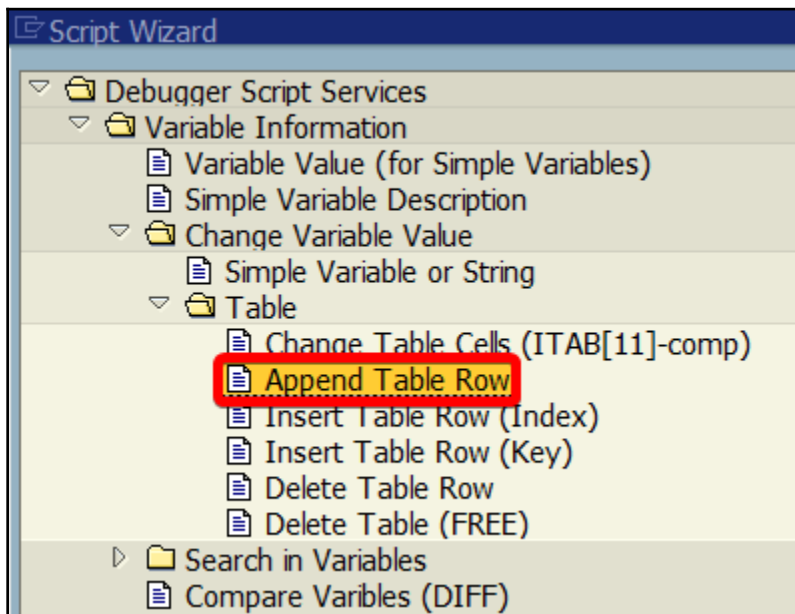
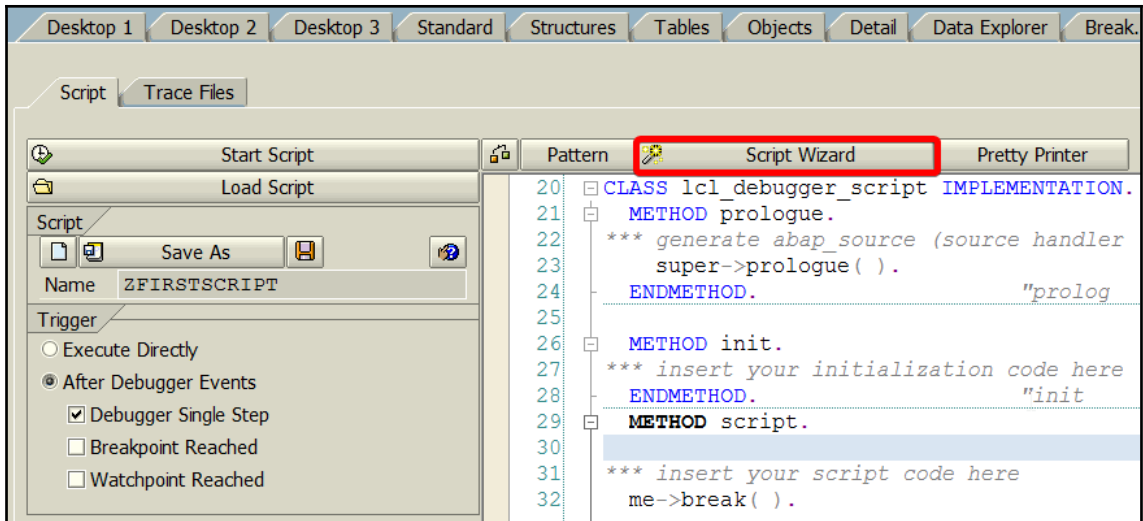
Start Script Load Script

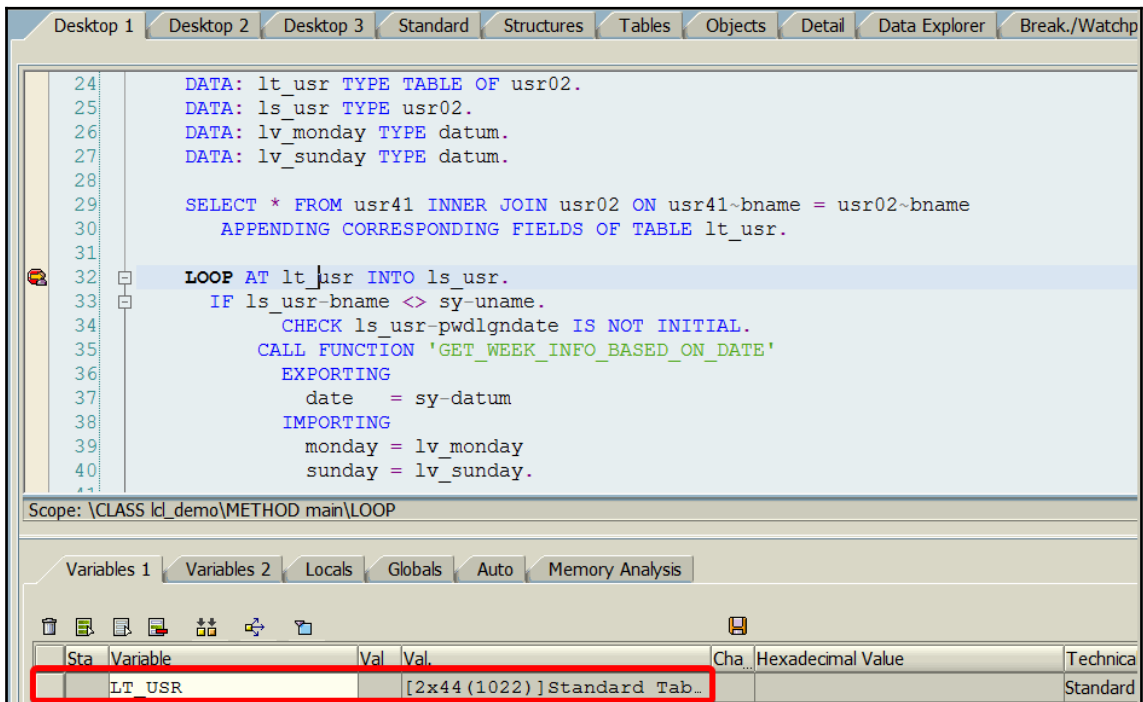
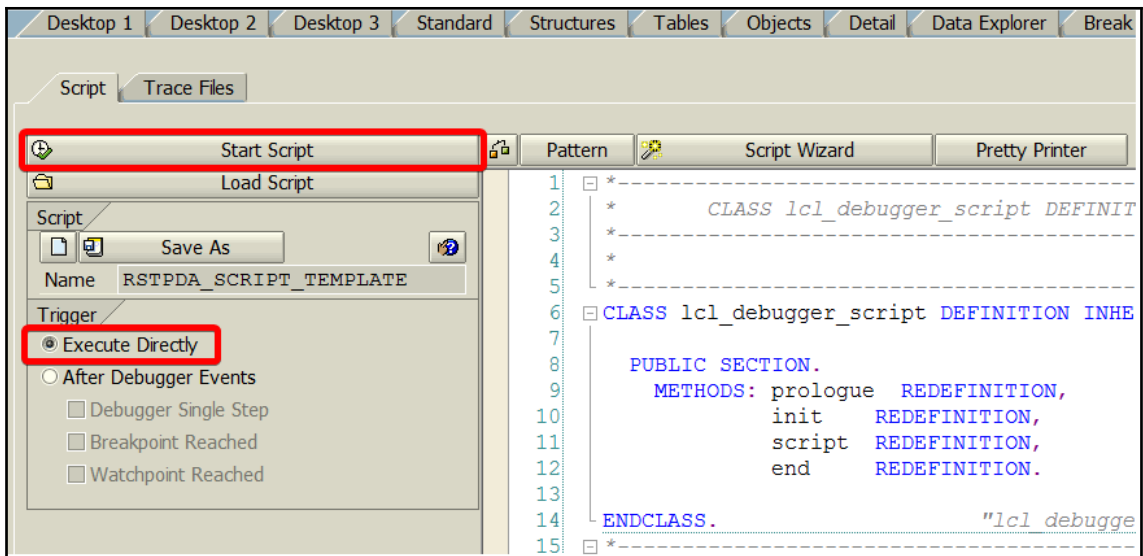
Script Save As Name ZFIRSTSCRIPT

Trigger

- Execute Directly
- After Debugger Events
  - Debugger Single Step
  - Breakpoint Reached
  - Watchpoint Reached

```
1 *-----
2 * CLASS lcl_debugger_script DEFINITION
3 *-----
4 *
5 *-----
6 CLASS lcl_debugger_script DEFINITION INHERITING FROM cl_tpda_s
7
8 PUBLIC SECTION.
9 METHODS: prologue REDEFINITION,
10 init REDEFINITION,
11 script REDEFINITION,
12 end REDEFINITION.
13
```





Desktop 1 Desktop 2 Desktop 3 Standard Structures Tables Objects Detail Data Explorer

Tables Table Contents

Table LT\_USR

Attributes Standard [2x44(1022)]

Insert Column Columns ...

Row	MANDT [C(3)]	BNAME [C(12)]	BCODE [X(8)]	GLTGV [D(8)]	GLTGB [D(8)]
1	800	PGRZESKO	0000000000000000	00000000	00000000
2		TESTUSR1	0000000000000000	00000000	00000000

**Program ZMSA\_R\_CHAPTER12\_3**

Program ZMSA\_R\_CHAPTER12\_3

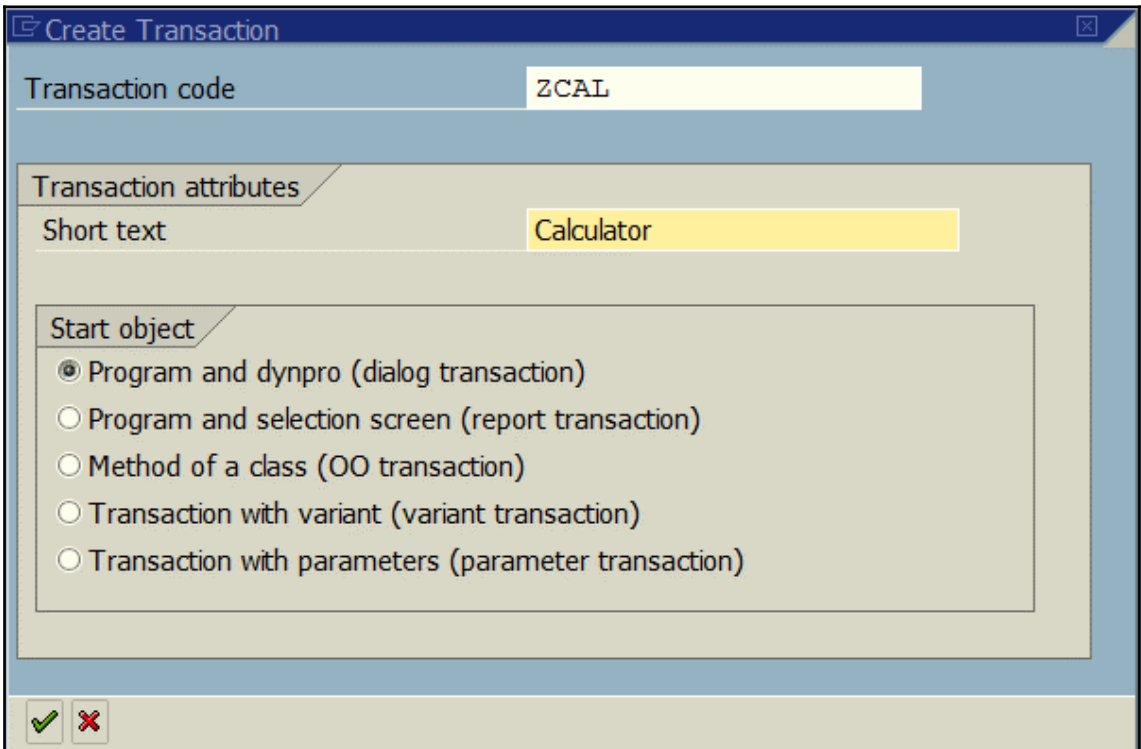
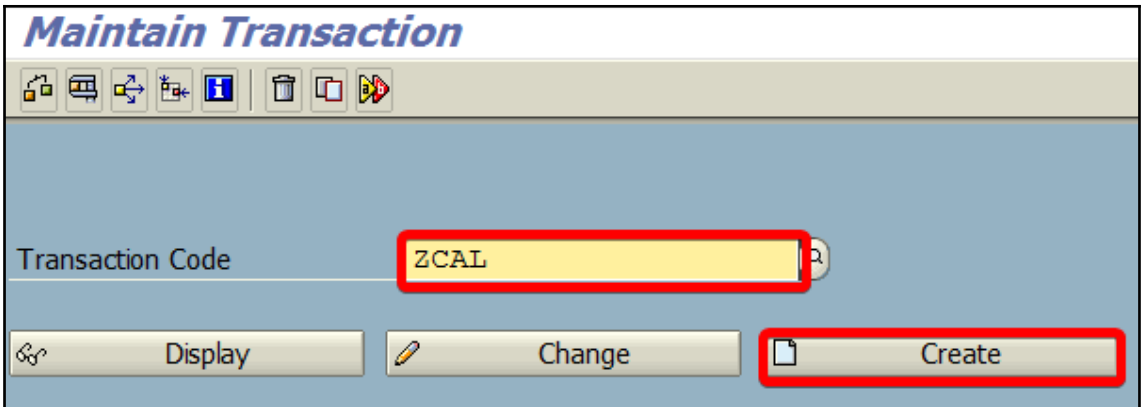
This user last password change was within this week:  
TESTUSR1

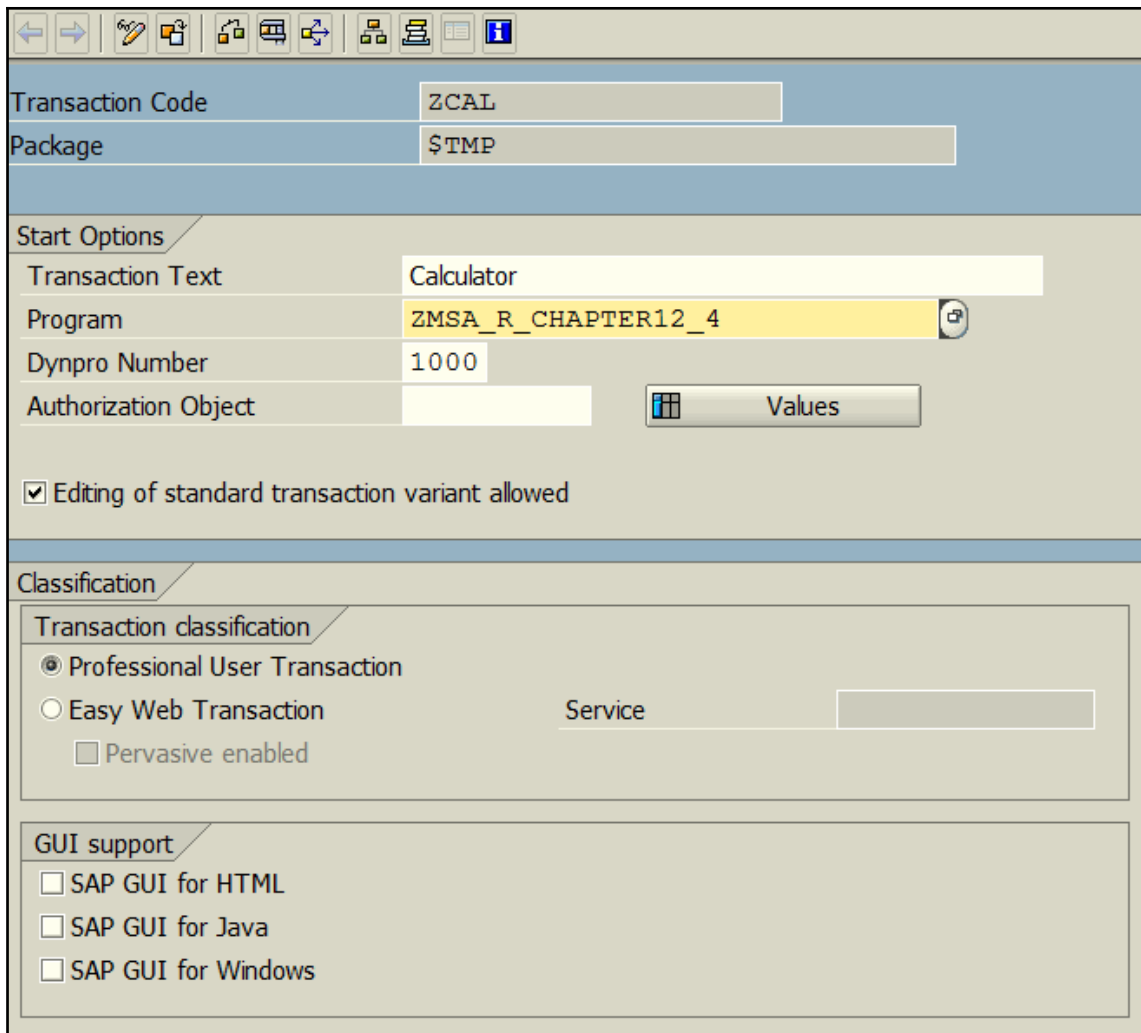
**Texts Language English**

Program ZMSA\_R\_CHAPTER12\_4 Active

Text Symbols Selection Texts List Headings

Description	Name	Text	DDIC Referen...
Program ZMSA_R_CHAPTE	P_NUM1	Number 1	<input type="checkbox"/>
	P_NUM2	Number 2	<input type="checkbox"/>
	P_RADIO1	Addition	<input type="checkbox"/>
	P_RADIO2	Subtraction	<input type="checkbox"/>
	P_RADIO3	Multiplication	<input type="checkbox"/>
	P_RADIO4	Division	<input type="checkbox"/>

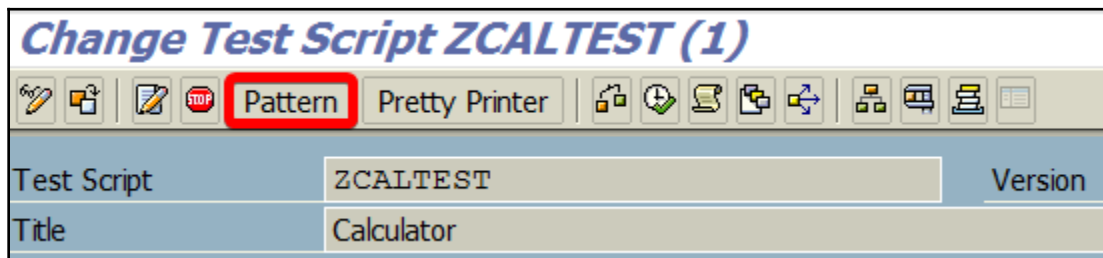
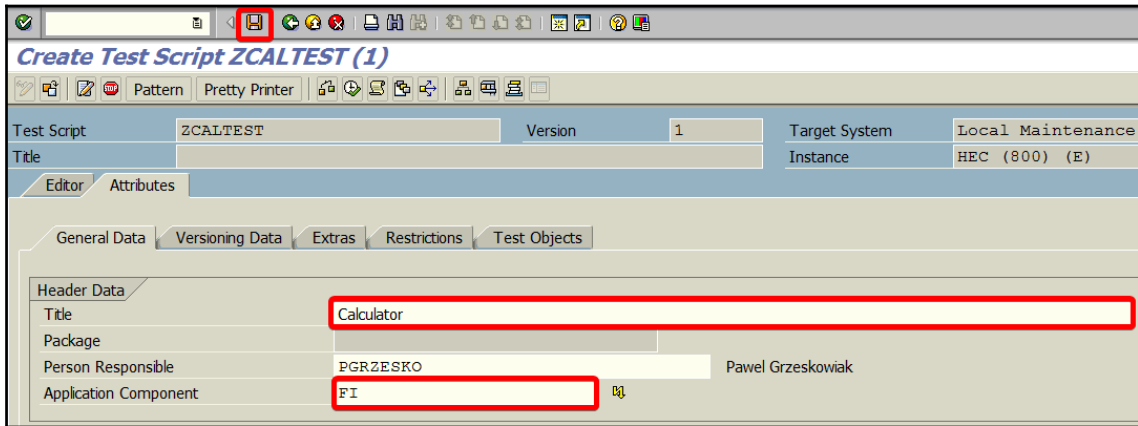
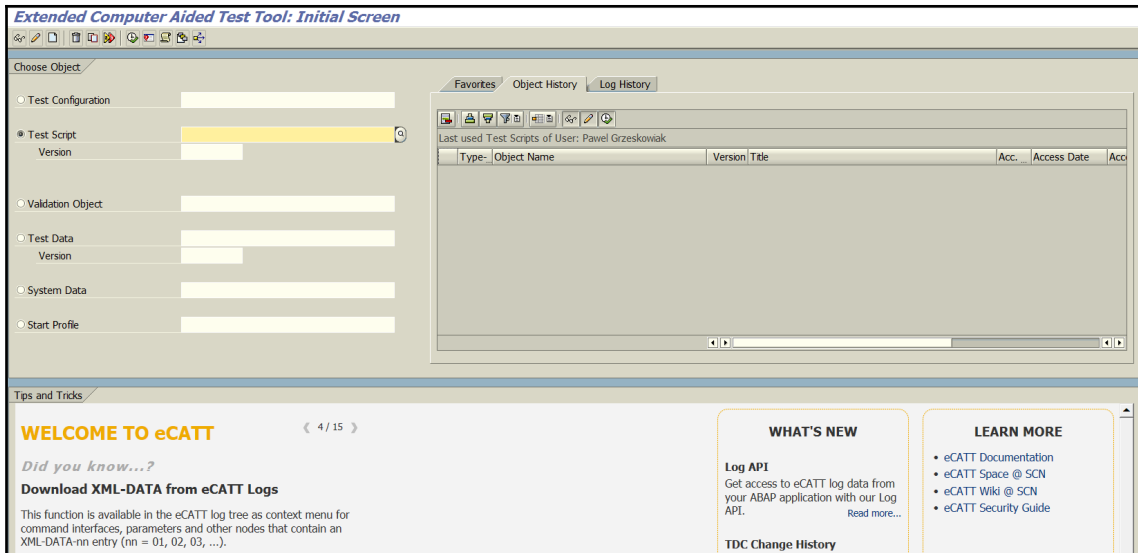


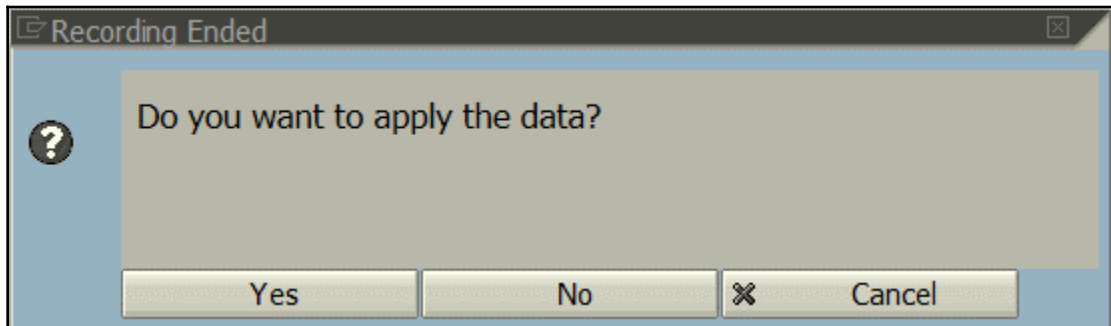
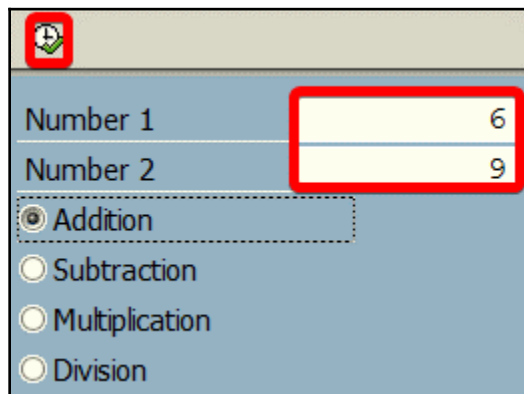
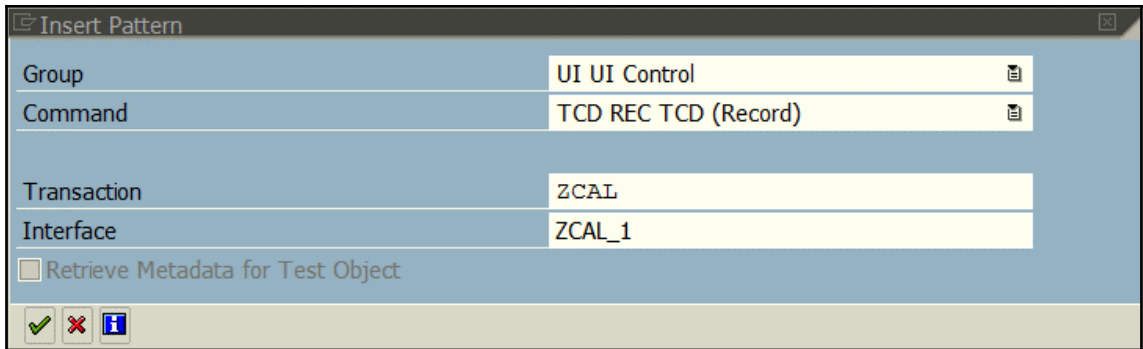


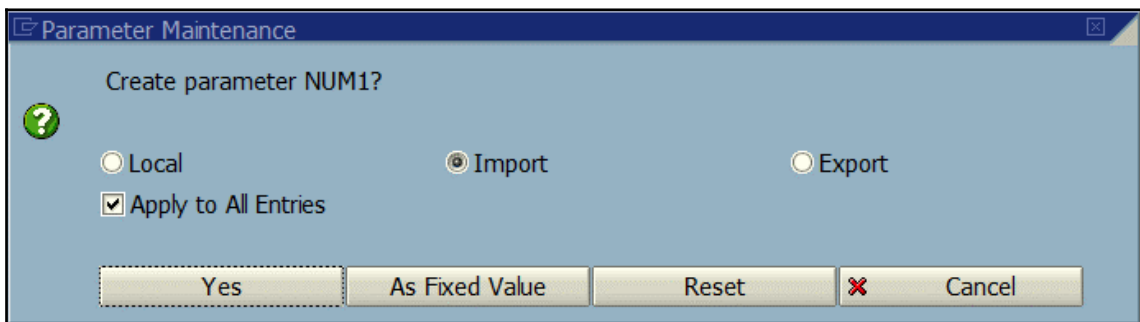
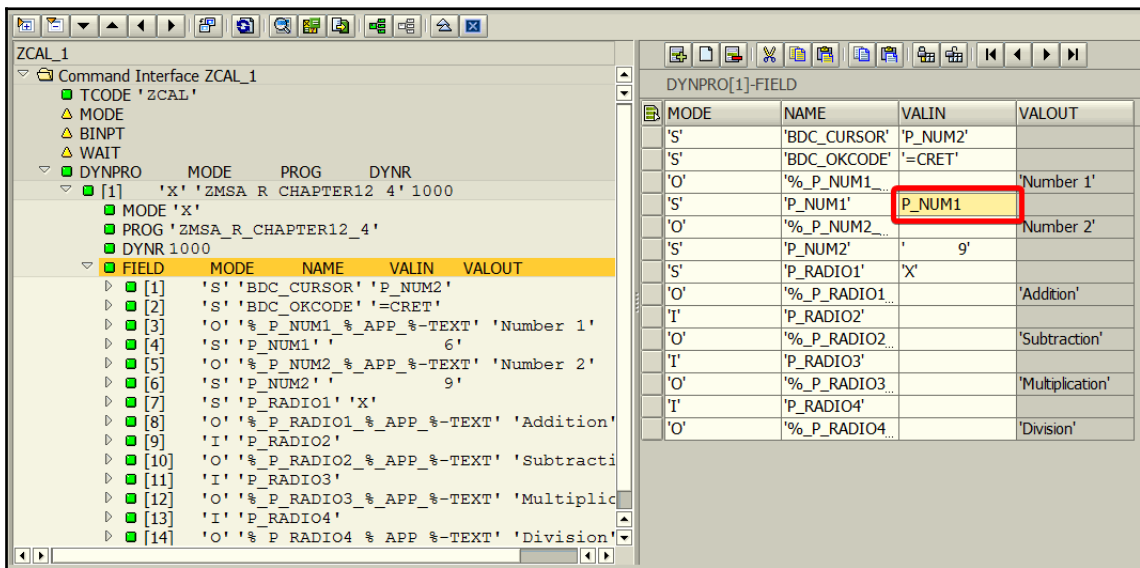
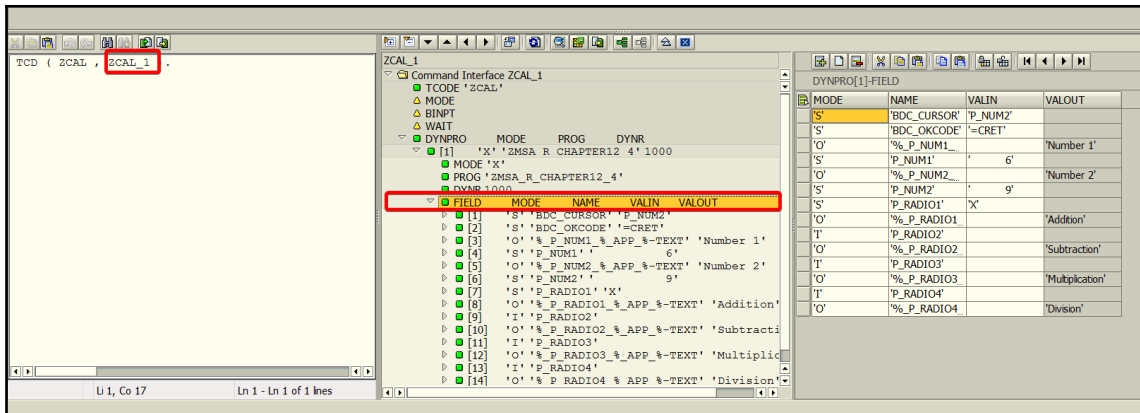
The image shows a screenshot of an SAP configuration screen for a transaction. At the top, there is a toolbar with various icons for navigation and editing. Below the toolbar, the screen is divided into several sections:

- Transaction Code:** ZCAL
- Package:** \$TMP
- Start Options:**
  - Transaction Text:** Calculator
  - Program:** ZMSA\_R\_CHAPTER12\_4 (highlighted in yellow)
  - Dynpro Number:** 1000
  - Authorization Object:** (empty field) with a "Values" button next to it.
- Editing of standard transaction variant allowed
- Classification:**
  - Transaction classification:**
    - Professional User Transaction
    - Easy Web Transaction
    - Pervasive enabled
  - Service:** (empty field)
- GUI support:**
  - SAP GUI for HTML
  - SAP GUI for Java
  - SAP GUI for Windows









DYNPRO[1]-FIELD

MODE	NAME	VALIN	VALOUT
'S'	'BDC_CURSOR'	'P_NUM2'	
'S'	'BDC_OKCODE'	'=CRET'	
'O'	'%_P_NUM1_...'		'Number 1'
'S'	'P_NUM1'	P_NUM1	
'O'	'%_P_NUM2_...'		'Number 2'
'S'	'P_NUM2'	P NUM2	
'S'	P_RADIO	'X'	
'O'	'%_P_RADIO1_...'		'Addition'
'I'	'P_RADIO2'		
'O'	'%_P_RADIO2_...'		'Subtraction'
'I'	'P_RADIO3'		
'O'	'%_P_RADIO3_...'		'Multiplication'
'I'	'P_RADIO4'		
'O'	'%_P_RADIO4_...'		'Division'

Parameter	Description	Parameter Value	Visibility	Parameter Reference	Alias	Target System	ABAP Type	Length	Dec.Pl.	Group
P_NUM1	BDC field value		I	BDC_FVAL			C	132		
P_NUM2	BDC field value		I	BDC_FVAL			C	132		
P_RESULT	Result Field		I	STRING			g			
P_RADIO	Field name	P_RADIO1	I	FNAM_...4			C	132		

```
TCD ( ZCAL , ZCAL 1 ).
CHEVAR ( ZCAL_1-MSG[1]-MSGV1 = P_RESULT ) .
```

Pattern Pretty Printer

Parameter	Description	Default Parameter Value	Parameter Value	Parameter Reference
P_NUM1	BDC field value		5	BDC_FVAL
P_NUM2	BDC field value		10	BDC_FVAL
P_RESULT	Result Field		15	STRING
P_RADIO	Field name	P_RADIO1		FNAM____4

```

0000000005 Test Script ZCALTEST Version 1 - SECATT [W/o Interruption] [1 s]
  HEC 800 PGRZESKO (Pawel Grzeskowiak) E 752 pl-wro-hxapps Linux HDB 20.11.2018 12:38:27
  Test Caller
  Start Options XML-DATA-01
  ZCALTEST Version 1 [ 0,118] My first
    IMPORT ZCALTEST
    TCD ZCAL [0,050 / SUT: 0,003 N] Calculator
      S00001 15
    CHEVAR ( ZCAL_1-MSG[1]-MSGV1 = P_RESULT )
      EXPORT ZCALTEST
  
```

### Extended Computer Aided Test Tool: Initial Screen

Choose Object

Test Configuration

Test Script

Version

Configuration Variants Attributes

General Data Extras Restrictions Attachments

Header Data

Title	My First Calculator Test Configuration
Package	
Person Responsible	PGRZESKO
Application Component	FI

Configuration Variants Attributes

Test Script

Test Script	ZCALTEST
Tool Name	ECATT

System Data

System Data Cont.	
Target System	

Mode

External Variants / Path C:\Users\pgrzesko\Documents\SAP\SAP GUI

File \_\_\_\_\_

Internal Variants

---

1/1

Execute	Variant	Descriptn	Attachment	P_NUM1	P_NUM2	P_RESULT	P_RADIO
<input type="checkbox"/>	1			1	2	3	P_RADIO1
<input type="checkbox"/>	2			5	8	13	P_RADIO1
<input type="checkbox"/>	3			3	2	1	P_RADIO2
<input type="checkbox"/>	4			13	15	2-	P_RADIO2
<input type="checkbox"/>	5			2	2	4	P_RADIO3
<input type="checkbox"/>	6			5	100	500	P_RADIO3
<input type="checkbox"/>	7			25	5	5	P_RADIO4
<input type="checkbox"/>	8			200	0	N/A	P_RADIO4
<input checked="" type="checkbox"/>	ECATTDEFAULT						P_RADIO1

General Variants UI Control Breakpoints Cov. Measurement

Mode

Path C:\Users\pgrzesko\Documents\SAP\SAP GUI

External	Object Type	Alas	Object Name	Title
<input type="checkbox"/>	Test Configuration		ZCALTEST	My First Calculator Test Configuration

Selection of Internal Variants

Special, Generic

Execute Variant Description Attachment P\_NUM1 P\_NUM2 P\_RESULT P\_RADIO

Execute	Variant	Description	Attachment	P_NUM1	P_NUM2	P_RESULT	P_RADIO
<input type="checkbox"/>	ECATTDEFAULT						P_RADIO1
<input type="checkbox"/>	ECATTDEFAULTRUN	Default Values for Start Process					
<input checked="" type="checkbox"/>	1			1	2	3	P_RADIO1
<input checked="" type="checkbox"/>	2			5	8	13	P_RADIO1
<input checked="" type="checkbox"/>	3			3	2	1	P_RADIO2
<input checked="" type="checkbox"/>	4			13	15	2-	P_RADIO2
<input checked="" type="checkbox"/>	5			2	2	4	P_RADIO3
<input checked="" type="checkbox"/>	6			5	100	500	P_RADIO3
<input checked="" type="checkbox"/>	7			25	5	5	P_RADIO4
<input checked="" type="checkbox"/>	8			200	0	N/A	P_RADIO4

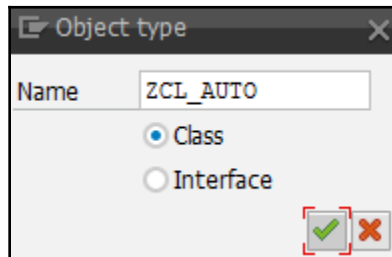
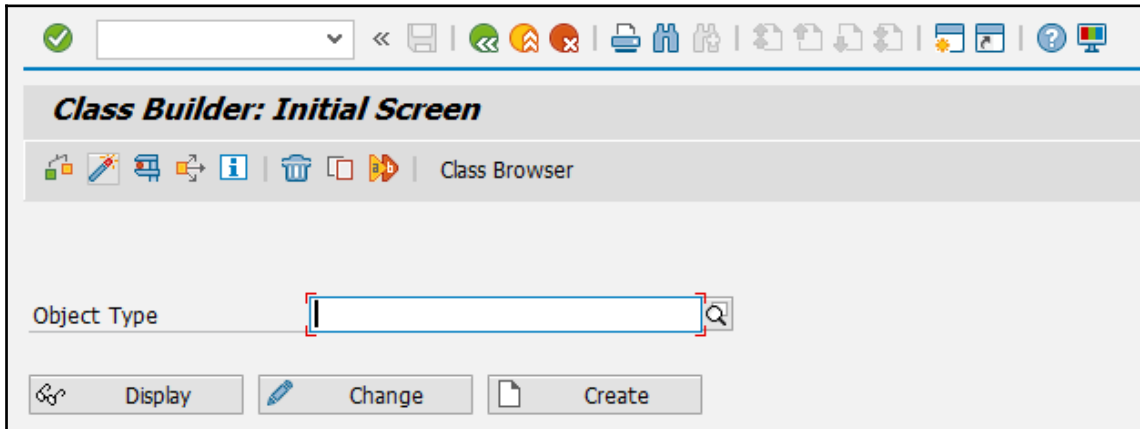
2 Expand Levels Expand Error

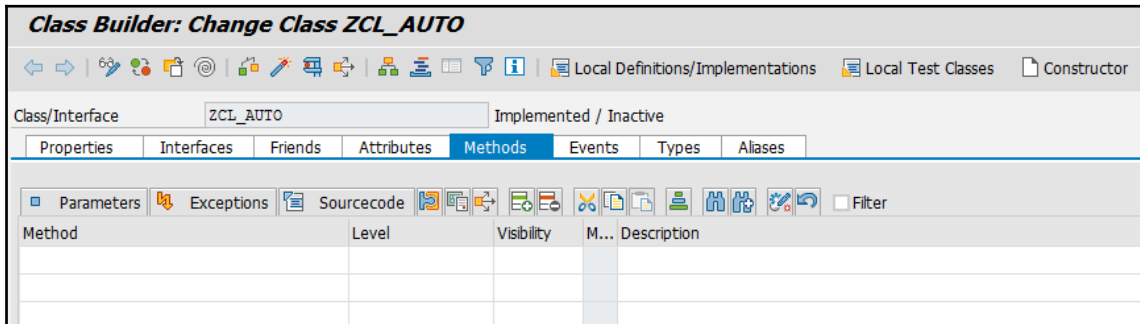
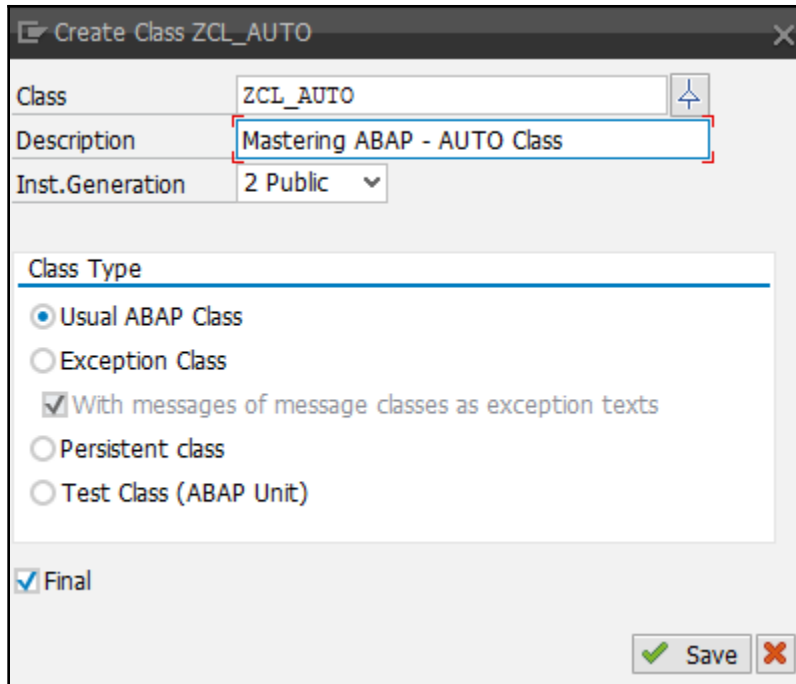
0000000007 Test Configuration ZCALTEST - SECATT [W/o Interruption] [3 s]

- HEC 800 PGRZESKO (Pawel Grzeskowiak) E 752 pl-wro-hxapps Linux HDB 20.11.2018 12:56:17
- Test Caller
- Start Options XML-DATA-01
- ZCALTEST [ 2,036] My First Calculator Test Configuration
  - Version Finding -> XML-DATA-05
    - ZCALTEST Version 1 [ 0,196] Variant 1
    - ZCALTEST Version 1 [ 0,063] Variant 2
    - ZCALTEST Version 1 [ 0,063] Variant 3
    - ZCALTEST Version 1 [ 0,063] Variant 4
    - ZCALTEST Version 1 [ 0,132] Variant 5
    - ZCALTEST Version 1 [ 0,064] Variant 6
    - ZCALTEST Version 1 [ 0,173] Variant 7
      - IMPORT 7
      - TCD ZCAL [0,047 / SUT: 0,003 N] Calculator
      - S00001 5
      - CHEVAR ( ZCAL 1-MSG[1]-MSGV1 = P RESULT )
        - ZCAL\_1-MSG[1]-MSGV1 = 5
        - P RESULT = 5
      - EXPORT 7
    - ZCALTEST Version 1 [ 0,238] Variant 8



# Chapter 13: Advanced Techniques in ABAP Objects





**Class Builder: Change Class ZCL\_AUTO**

← → | | Local Definitions/Implementations Local

Class/Interface  Implemented / Active

Properties Interfaces Friends **Attributes** Methods Events Types Aliases

Properties  Filter

Attribute	Level	Visibility	R...	Typing	Associated Type	Initial Value
TANK_CAP	Constant	Public	<input type="checkbox"/>	Type	T_FUEL	70
BRAND	Instance Attribute	Public	<input type="checkbox"/>	Type	T_BRAND	
NUMB_OF_CARS	Static Attribute	Public	<input type="checkbox"/>	Type	I	
FUEL	Instance Attribute	Private	<input type="checkbox"/>	Type	T_FUEL	

**Class Builder: Change Class ZCL\_AUTO**

← → | | Local Definitions/Implementations Local

Class/Interface  Implemented / Active

Properties Interfaces Friends Attributes **Methods** Events Types Aliases

Parameters Exceptions Sourcecode  Filter

Method	Level	Visibility	M...	Description
CONSTRUCTOR	Instance Method	Public		CONSTRUCTOR
REFUEL	Instance Method	Public		
GET_FUEL_STATUS	Instance Method	Public		
CHECK_SPACE	Instance Method	Private		

**Class Builder: Change Class ZCL\_AUTO**

← → | | Local Definitions/Implementations

Class/Interface  Implemented / Active

Properties Interfaces Friends Attributes Methods Events **Types** Aliases

Properties  Filter

Type	Visibility	Typing	Associated...	Description
T_BRAND	Public	Type	CHAR20	Char 20
T_FUEL	Public	Type	I	
T_MODEL	Public	Type	CHAR20	Char 20

**Class Builder: Change Class ZCL\_AUTO**

← → | | Local Definitions/Implementations

Class/Interface  Implemented / Active

Properties Interfaces Friends Attributes **Methods** Events Types Aliases

Parameters of Method

← Methods Exceptions Sourcecode Properties

Parameter	Type	P...	O...	Typing Method	Associated Type
IV_FUEL	Importing	<input type="checkbox"/>	<input type="checkbox"/>	Type	T_FUEL
		<input type="checkbox"/>	<input type="checkbox"/>	Type	
		<input type="checkbox"/>	<input type="checkbox"/>	Type	
		<input type="checkbox"/>	<input type="checkbox"/>	Type	
		<input type="checkbox"/>	<input type="checkbox"/>	Type	

### Class Builder Class ZCL\_AUTO Change

Pattern    Pretty Printer    Signature    Public Section

Ty.	Parameter	Typing	Descript..
	IV_FUEL	TYPE T_FUEL	
	NO_SPACE		

\*\*\*\*\*

Method: REFUEL    Active

```

1 | METHOD refuel.
2 |     IF check_space( iv_fuel ) >= iv_fuel.
3 |         ADD iv_fuel TO fuel.
4 |     ELSE.
5 |         RAISE no_space.
6 |     ENDIF.
7 | ENDMETHOD.
  
```

### Class Builder: Change Class ZCL\_AUTO

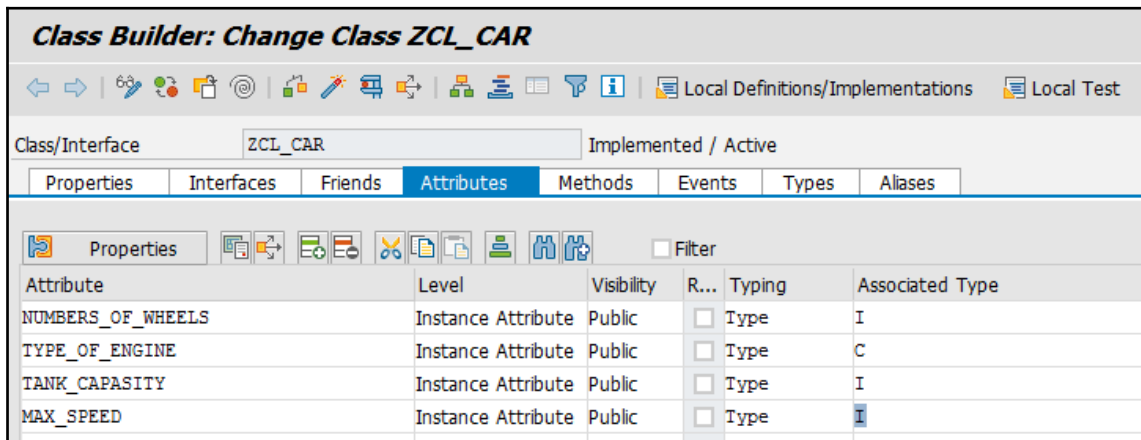
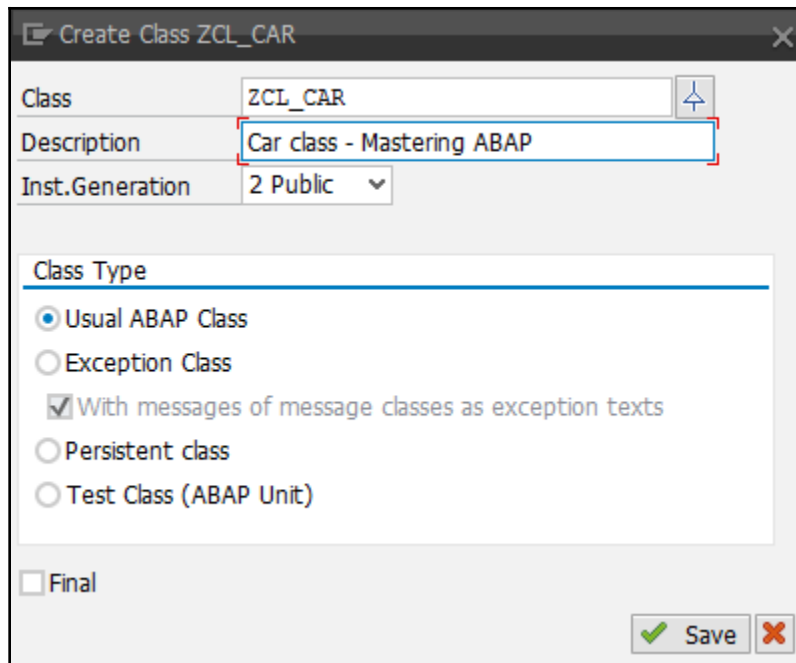
Local Definitions/Implementations    Local Test Classes    Class

Class/Interface: ZCL\_AUTO    Implemented / Active

Properties    Interfaces    Friends    **Attributes**    Methods    Events    Types    Aliases

Filter

Attribute	Level	Visibility	R...	Typing	Associated Type	Description
TANK_CAP	Constant	Public	<input type="checkbox"/>	Type	T_FUEL	
BRAND	Instance Attribute	Public	<input type="checkbox"/>	Type	T_BRAND	Char 20
NUMB_OF_CARS	Static Attribute	Public	<input type="checkbox"/>	Type	I	
FUEL	Instance Attribute	Private	<input type="checkbox"/>	Type	T_FUEL	
GR_ENGINE	Instance Attribute	Private	<input type="checkbox"/>	Type Ref To	ZCL_ENGINE	Engine class



Create Class ZCL\_TRUCK

Class	ZCL_TRUCK
Superclass	ZCL_CAR
Description	Truck Class - Mastering ABAP
Inst. Generation	2 Public

Class Type

- Usual ABAP Class
- Exception Class
- With messages of message classes as exception texts
- Persistent class
- Test Class (ABAP Unit)

Final

Save Cancel

Create Class ZCL\_TRUCK

Class: ZCL\_TRUCK

Superclass: ZCL\_CAR

Description: Truck Class - Mastering ABAP

Inst.Generation: 2 Public

Class Type

- Usual ABAP Class
- Exception Class
  - With messages of message classes as exception texts
- Persistent class
- Test Class (ABAP Unit)

Final

Save

**Class Builder: Change Class ZCL\_TRUCK**

Local Definitions/Implementations Local

Class/Interface: ZCL\_TRUCK Implemented / Active

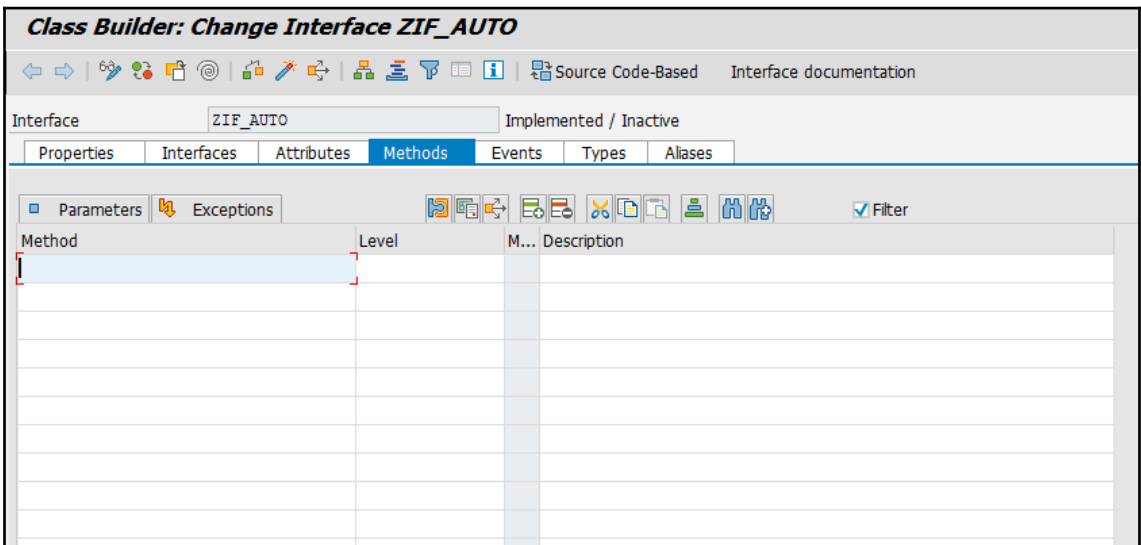
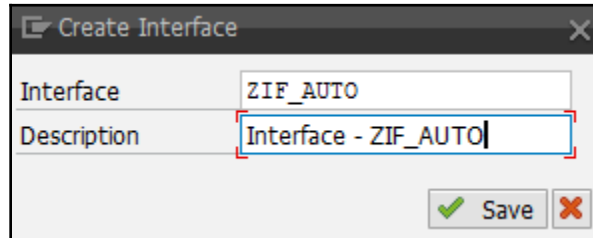
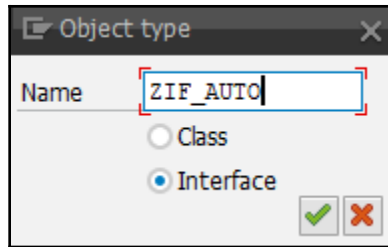
Properties Interfaces Friends **Attributes** Methods Events Types Aliases

Properties Filter

Attribute	Level	Visibility	R...	Typing	Associated Type
NUMBERS_OF_WHEELS	Instance Attribute	Public	<input type="checkbox"/>	Type	I
TYPE_OF_ENGINE	Instance Attribute	Public	<input type="checkbox"/>	Type	C
TANK_CAPACITY	Instance Attribute	Public	<input type="checkbox"/>	Type	I
MAX_SPEED	Instance Attribute	Public	<input type="checkbox"/>	Type	I







**Class Builder: Change Class ZCL\_AUTO**

Local Definitions/Implementations Local Test Classes Class constructor

Class/Interface  Implemented / Active (revised)

Properties Interfaces Friends Attributes Methods Events Types Aliases

Properties  Filter

Interface	Abstract	Final	Model...	Description
ZIF_AUTO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Interface - ZIF_AUTO
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Class Builder: Change Class ZCL\_AUTO**

Local Definitions/Implementations Local Test

Class/Interface  Implemented / Active

Properties Interfaces Friends Attributes **Methods** Events Types Aliases

Parameters Exceptions Sourcecode  Filter

Method	Level	Visibility	M...	Description
ZIF_AUTO~CHECK_BRAND	Instance Method	Public		
CONSTRUCTOR	Instance Method	Public		CONSTRUCTOR
REFUEL	Instance Method	Public		
GET_FUEL_STATUS	Instance Method	Public		
CHECK_SPACE	Instance Method	Private		

**Class Builder: Change Class ZCL\_AUTO**

← → | | | | | | | | Local Definitions/Implementations Local Test Classes

Class/Interface  Implemented / Active

Properties Interfaces Friends Attributes Methods Events Types **Aliases**

Properties  Filter

Interface Component	Type	Visibility	Alias
ZIF_AUTO~CHECK_BRAND		Public	CHECK_BRAND

**Class Builder: Change Class ZCL\_AUTO**

← → | | | | | | | | Local Definitions/Implementations Local Test Classes Class constructor

Class/Interface  Implemented / Active

Properties Interfaces Friends Attributes Methods **Events** Types Aliases

Parameters Properties  Filter

Event	Type	Visibility	Description
BROKE	Instance Event	Public	



Change Method BROKE\_CAR

Object Type

Method

Description

Visibility	Method
<input checked="" type="radio"/> Public	<input type="radio"/> Static
<input type="radio"/> Protected	<input checked="" type="radio"/> Instance
<input type="radio"/> Private	

Abstract

Final

Event Handler for

Class/interface

Event

Modeled

Editor lock

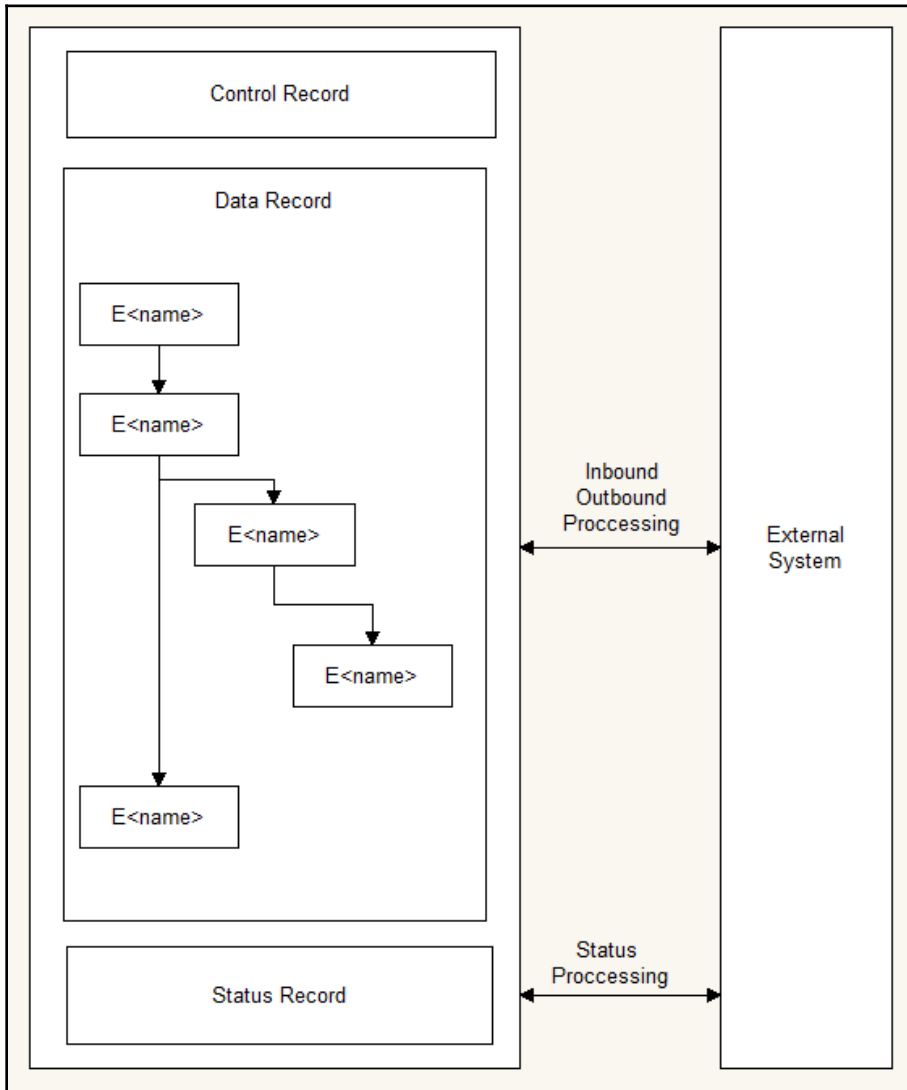
Active

Created by

Last changed by (Defn)

Last changed by (Imp.)

# Chapter 14: Integrating SAP with Third-Party Systems



Function Builder: Change ZBAPI\_DEMO

Function module: ZBAPI\_DEMO Inactive

Attributes | Import | Export | Changing | Tables | Except

Classification

Function Group: ZBAPI\_DEMO ZBAPI\_DEMO

Short Text: ZBAPI\_DEMO

Processing Type

Normal Function Module  
 Remote-Enabled Module  BasXML supported  
 Update Module  
 Start immed.  
 Immediate Start, No Restart  
 Start Delayed  
 Coll.run

Function Builder: Display ZBAPI\_DEMO

Function module: ZBAPI\_DEMO Active

Attributes | Import | Export | Changing | Tables | Exceptions | Source code

Parameter Name	Typi...	Associated Type	Default value	Op...	Pa...	Short text	Lo...
CARRID	TYPE	ZBAPISFLIGHT-PLANETYPE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Total of current bookings	
				<input type="checkbox"/>	<input type="checkbox"/>		

Function Builder: Change ZBAPI\_DEMO

Function module ZBAPI\_DEMO Inactive (Revised)

Attributes Import **Export** Changing Tables Exceptions Source code

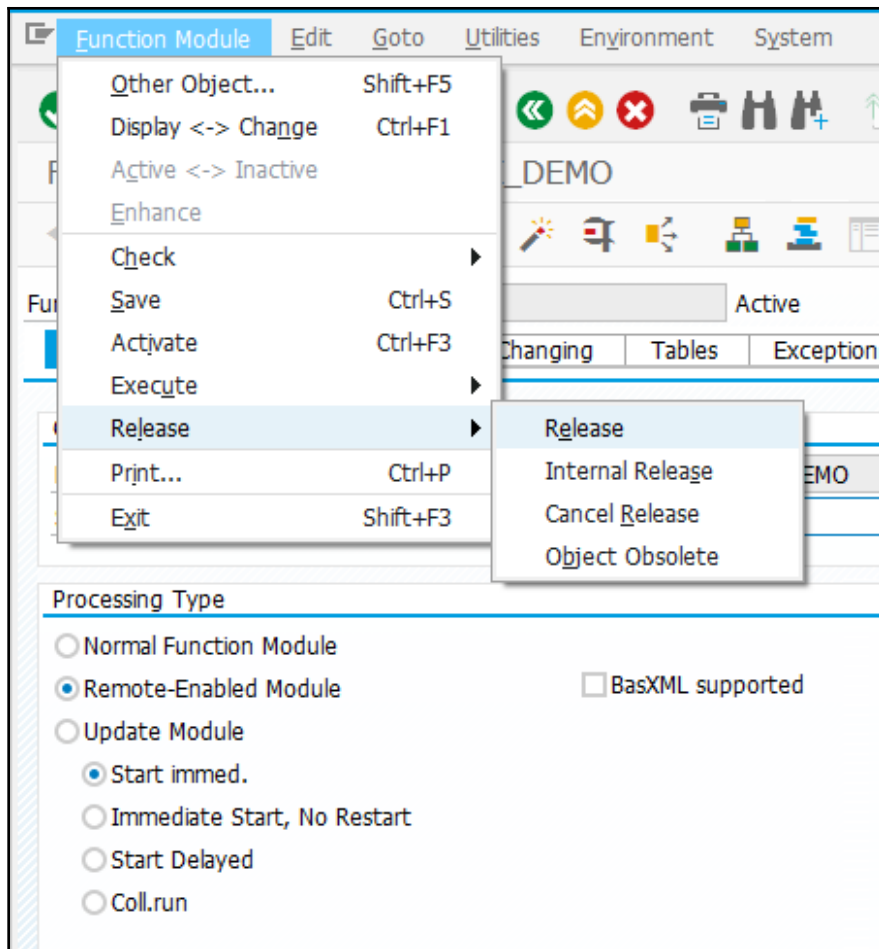
Parameter Name	Typing	Associated Type	Pass Val...	Short text	Long T...
RETURN	TYPE	BAPIRET2	<input checked="" type="checkbox"/>	Return Parameter	Cr...

Function Builder: Display ZBAPI\_DEMO

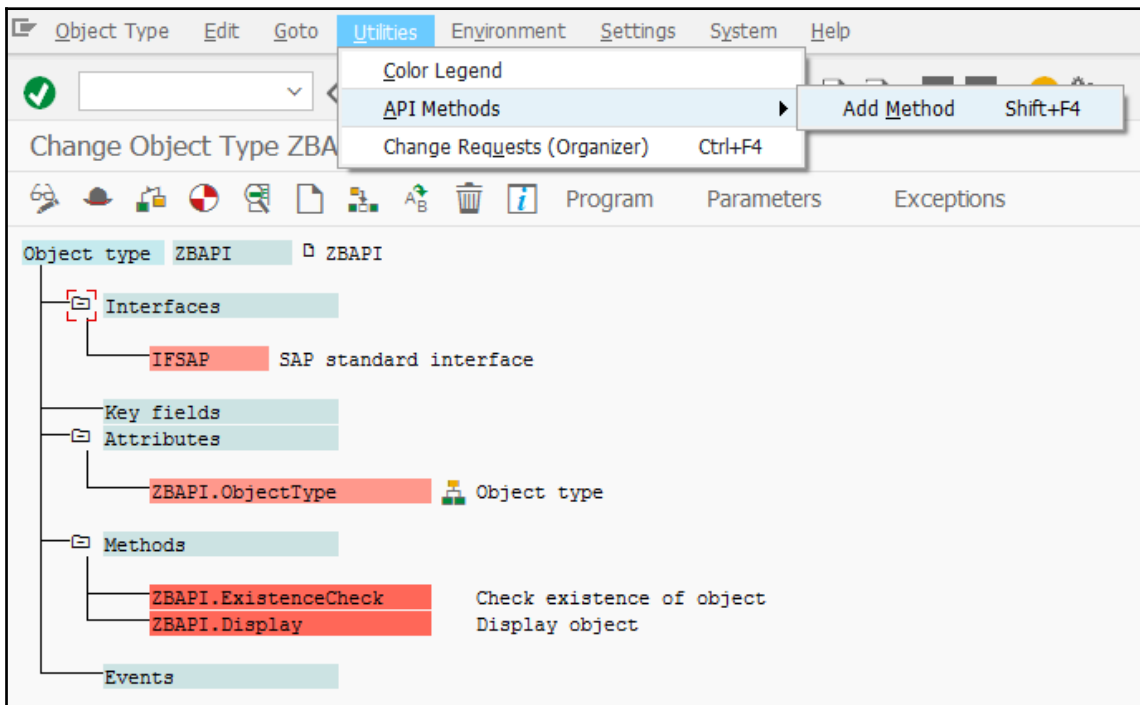
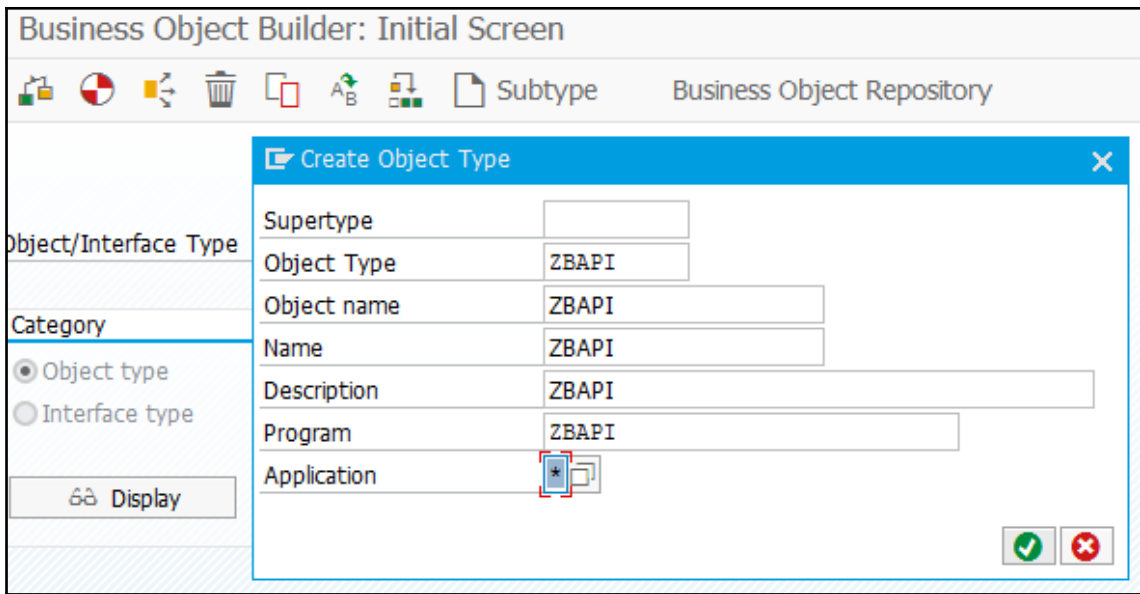
Function module ZBAPI\_DEMO Active

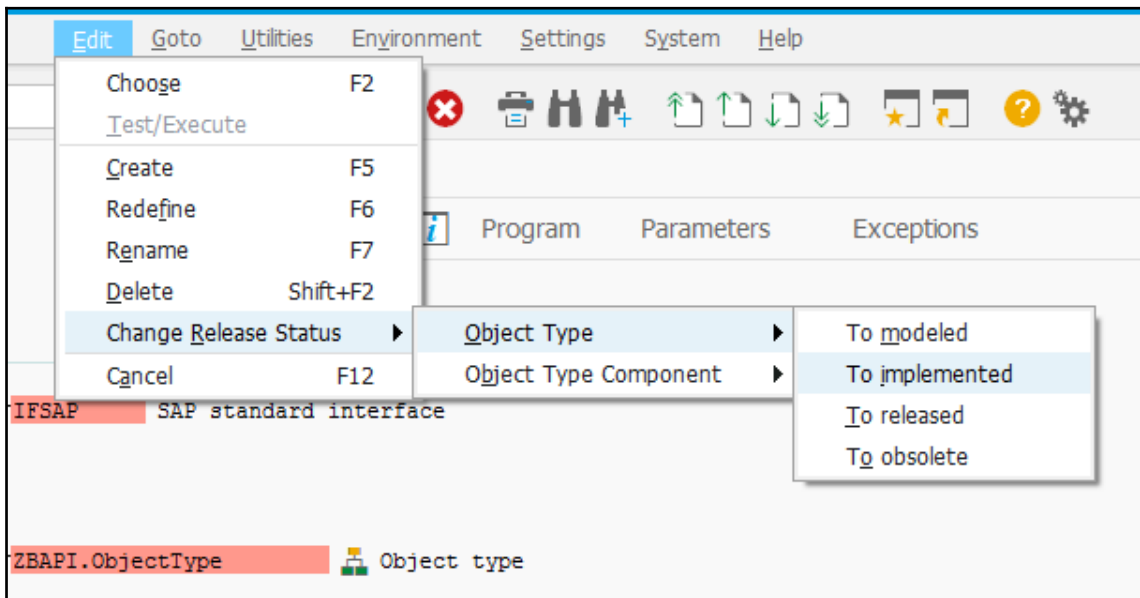
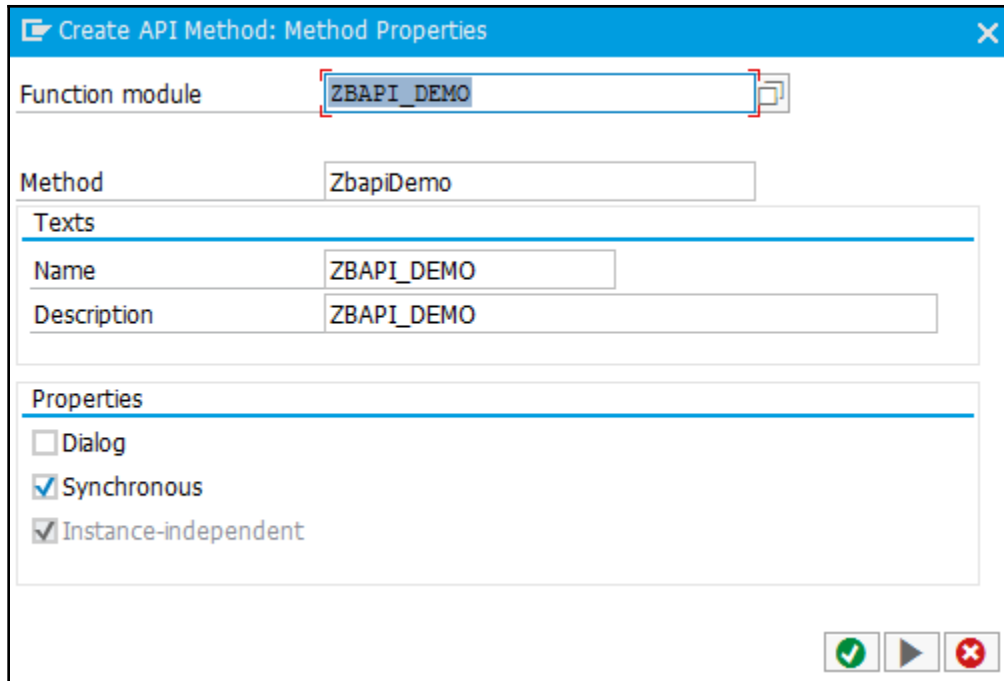
Attributes Import Export Changing **Tables** Exceptions Source code

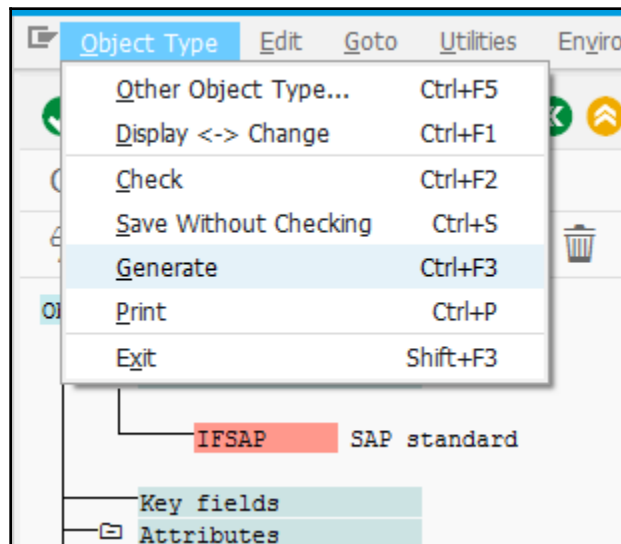
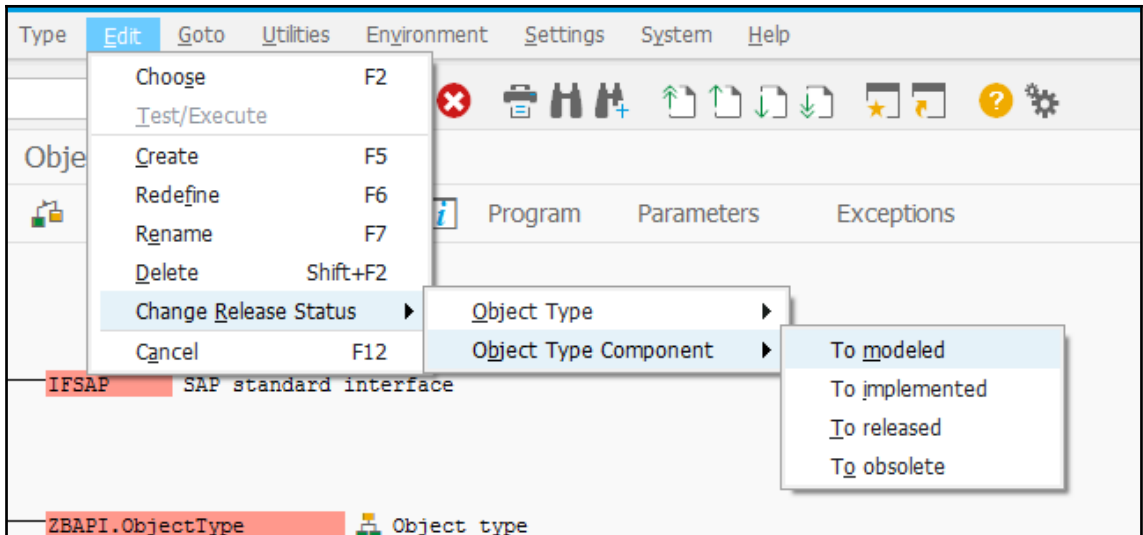
Parameter Name	Typing	Associated Type	Optional	Short text	Long T...
ZSFLIGHT	LIKE	ZBAPISFLIGHT	<input type="checkbox"/>		











**Activate and Maintain Services**

Service Catalog

Type	Technical Service Name	Ver.	Service Description	External Service Name	Namespace	OAuth	Soft. State	Status	Processing Mode
	/IWFND/SG_MED_CATALOG	1	Catalog Service	CATALOGSERVICE	/IWFND/				Routing-based
	/IWFND/SG_MED_CATALOG	2	Catalog Service Version 2	CATALOGSERVICE	/IWFND/				Routing-based
BEP	/IWFND/GWDEMO_SP2	1	ZCL_ZTEST_GWDEMO_DPC_EXT	GWDEMO_SP2	/IWBEP/				Routing-based
	/IWFND/SG_MGW_NOTIF_STORE	1	ODATA Channel: Notification Store	NOTIFICATIONSTORE	/IWFND/				Routing-based
BEP	/IWFND/SUBSCRIPTIONMANAGEMENT	2	MOC enabled Subscription Management Service	SUBSCRIPTIONMANAGEMENT	/IWBEP/				Routing-based
	/IWFND/USAGEEXTRACTOR	1	Metering Usage Extractor	USAGEEXTRACTOR	/IWFND/				Routing-based
	/IWFND/SG_USER_SERVICE	1	Information Worker - User Service	USERSERVICE	/IWFND/				Routing-based

ICF Nodes

Status	ICF Node	Session Time-out	Soft State	Description
OK	ODATA	00:00:00		Standard Mode

System Aliases

SAP System Alias	Description	Default System	Metadata	User Role

**SAP Gateway Client**

Execute Select Service Administration Service Implementation EntitySets Add URI Option

HTTP Method:  GET  POST  PUT  PATCH  MERGE  DELETE  Reuse HTTP Connection

Request URI: /sap/opu/odata/IWBEP/GWDEMO/\$metadata

Protocol:  HTTP  HTTPS Test Group Test Case

HTTP Request

Header Name	Value

HTTP Response

Header Name	Value

**SAP Gateway: Error Log**

Re-Select

Error Context Active Source Download to PC Upload from PC

Overview

Line	Entry ...	Date	Time	User	T100 Error ID	T100 ...	Error C...	ICF No...	HTT...	Ba Error

**SAP Gateway Service Builder**

The screenshot shows the SAP Gateway Service Builder interface. On the left is a project tree for the scenario `/IWBEP/EPM_DEV_SCENARIO_2`. The tree is expanded to show the `Data Model` folder, which contains `Entity Types`. Under `Entity Types`, the `Customer` entity is selected, and its `Properties` are highlighted. The right pane displays the `Properties` table for the selected entity.

Name	Is Key	Edm Core Type	Prec.	Scale	Max ...
CustomerId	<input checked="" type="checkbox"/>	Edm.String	0	0	10
EmailAddress	<input type="checkbox"/>	Edm.String	0	0	255
PhoneNumber	<input type="checkbox"/>	Edm.String	0	0	30
City	<input type="checkbox"/>	Edm.String	0	0	40
PostalCode	<input type="checkbox"/>	Edm.String	0	0	10
Street	<input type="checkbox"/>	Edm.String	0	0	60
HouseNumber	<input type="checkbox"/>	Edm.String	0	0	10
Country	<input type="checkbox"/>	Edm.String	0	0	3
FirstName	<input type="checkbox"/>	Edm.String	0	0	40
LastName	<input type="checkbox"/>	Edm.String	0	0	40
DateOfBirth	<input type="checkbox"/>	Edm.DateTime	0	0	0

```

<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<edmx:Edmx xmlns:edmx="http://schemas.microsoft.com/ado/2007/06/edmx" xmlns:m="http://schemas.microsoft.com/ado/2008/09/edm" ?>
  <edmx:DataServices m:DataServiceVersion="2.0">
    <Schema xmlns="http://schemas.microsoft.com/ado/2008/09/edm" Namespace="Z_ODATA_SERVICE" xml:lang="pl">
      <EntityType Name="Material" sap:content-version="1">
        <Key>
          <PropertyRef Name="MANDT"/>
          <PropertyRef Name="MATNR"/>
        </Key>
        <Property Name="MANDT" Type="Edm.String" Nullable="false" MaxLength="3"/>
        <Property Name="MATNR" Type="Edm.String" Nullable="false" MaxLength="18"/>
        <Property Name="MTART" Type="Edm.String" MaxLength="4"/>
        <Property Name="MBRSH" Type="Edm.String" MaxLength="1"/>
        <Property Name="MATKL" Type="Edm.String" MaxLength="9"/>
      </EntityType>
      <EntityContainer Name="Z_ODATA_SERVICE_Entities" m:IsDefaultEntityContainer="true">
        <EntityType Name="MaterialSet" m:IsDefaultEntityType="true">
          <EntitySet Name="MaterialSet" EntityType="Z_ODATA_SERVICE.Material" sap:content-version="1"/>
        </EntityType>
      </EntityContainer>
      <atom:link xmlns:atom="http://www.w3.org/2005/Atom" rel="self" />
      <atom:link xmlns:atom="http://www.w3.org/2005/Atom" rel="latest-version" />
    </Schema>
  </edmx:DataServices>
</edmx:Edmx>

```

**SAP Gateway Service Builder**

Project: ZODATA\_SERVICE  
Description: Demo flights information

Attributes

Project Type: Service with SAP Annotations  
Generation Strategy: Standard

Object Directory Entry

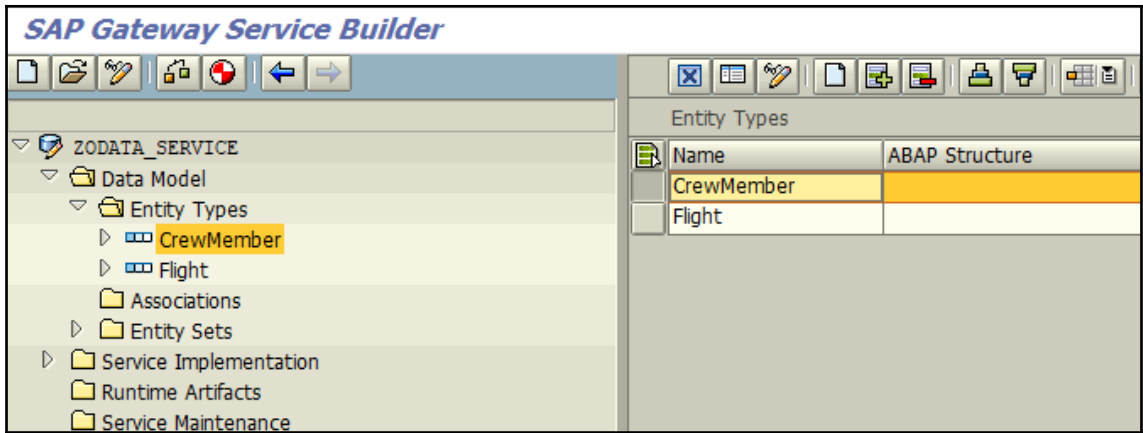
Package:   
Person Responsible:

Local Object

**SAP Gateway Service Builder**

ZODATA\_SERVICE Demo flights information

- Data Model
  - Entity Types
  - Associations
  - Entity Sets
- Service Implementation
- Runtime Artifacts
- Service Maintenance



Properties

Name	Is Key	Edm Core Type	Prec.	Scale	Max ...	Unit Property Name	Creat...	Upda...	Sorta...	Nulla...	Fit.
CarrierId	<input checked="" type="checkbox"/>	Edm.String	0	0	3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ConnectionId	<input checked="" type="checkbox"/>	Edm.String	0	0	4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FlightDate	<input checked="" type="checkbox"/>	Edm.Date Time	7	0	0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MemberId	<input checked="" type="checkbox"/>	Edm.String	0	0	10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FirstName	<input type="checkbox"/>	Edm.String	0	0	35		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LastName	<input type="checkbox"/>	Edm.String	0	0	35		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Properties

Name	Is Key	Edm Core Type	Prec.	Scale	Max ...	Unit Property Name	Creat...	Upda...	Sorta...	Nulla...	Fit.
CarrierId	<input checked="" type="checkbox"/>	Edm.String	0	0	3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ConnectionId	<input checked="" type="checkbox"/>	Edm.String	0	0	4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DepartureAirport	<input type="checkbox"/>	Edm.String	0	0	20		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DestinationAirport	<input type="checkbox"/>	Edm.String	0	0	20		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FlightTime	<input type="checkbox"/>	Edm.Int32	0	0	0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FlightDate	<input checked="" type="checkbox"/>	Edm.Date Time	7	0	0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Wizard Step 1 of 3: Create Association

Create Association

Association Name:

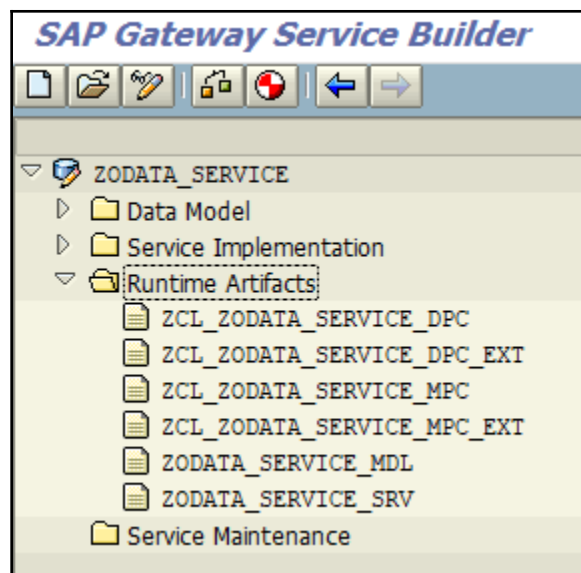
Principal Entity		Dependent Entity	
Entity Type Name	<input type="text" value="Flight"/>	Entity Type Name	<input type="text" value="CrewMember"/>
Cardinality	<input type="text" value="1"/>	Cardinality	<input type="text" value="1..n"/>
<input checked="" type="checkbox"/> Create related Navigation Property		<input type="checkbox"/> Create related Navigation Property	
Navigation Property	<input type="text" value="Crew"/>	Navigation Property	<input type="text"/>

**SAP Gateway Service Builder**

The screenshot displays the SAP Gateway Service Builder interface. On the left, a tree view shows the project structure under the path `/IWBEP/EPM_DEV_SCENARIO_2`. The 'Data Model' folder is expanded, showing 'Entity Types' with a 'Customer' entity selected. The 'Properties' folder under 'Customer' is also expanded. On the right, a table displays the properties of the selected entity.

Name	Is Key	Edm Core Type	Prec.	Scale	Max ...
CustomerId	<input checked="" type="checkbox"/>	Edm.String	0	0	10
EmailAddress	<input type="checkbox"/>	Edm.String	0	0	255
PhoneNumber	<input type="checkbox"/>	Edm.String	0	0	30
City	<input type="checkbox"/>	Edm.String	0	0	40
PostalCode	<input type="checkbox"/>	Edm.String	0	0	10
Street	<input type="checkbox"/>	Edm.String	0	0	60
HouseNumber	<input type="checkbox"/>	Edm.String	0	0	10
Country	<input type="checkbox"/>	Edm.String	0	0	3
FirstName	<input type="checkbox"/>	Edm.String	0	0	40
LastName	<input type="checkbox"/>	Edm.String	0	0	40
DateOfBirth	<input type="checkbox"/>	Edm.Date Time	0	0	0





**Add Service**

---

**Service**

Technical Service Name	ZODATA_SERVICE
Service Version	1
Description	Demo flights information
External Service Name	ZODATA_SERVICE
Namespace	
External Mapping ID	
External Data Source Type	C

---

**Model**

Technical Model Name	ZODATA_SERVICE_MDL
Model Version	1

---

**Creation Information**

Package Assignment	
	Local Object

---

**ICF Node**

Standard Mode  None

Set Current Client as Default Client in ICF Node

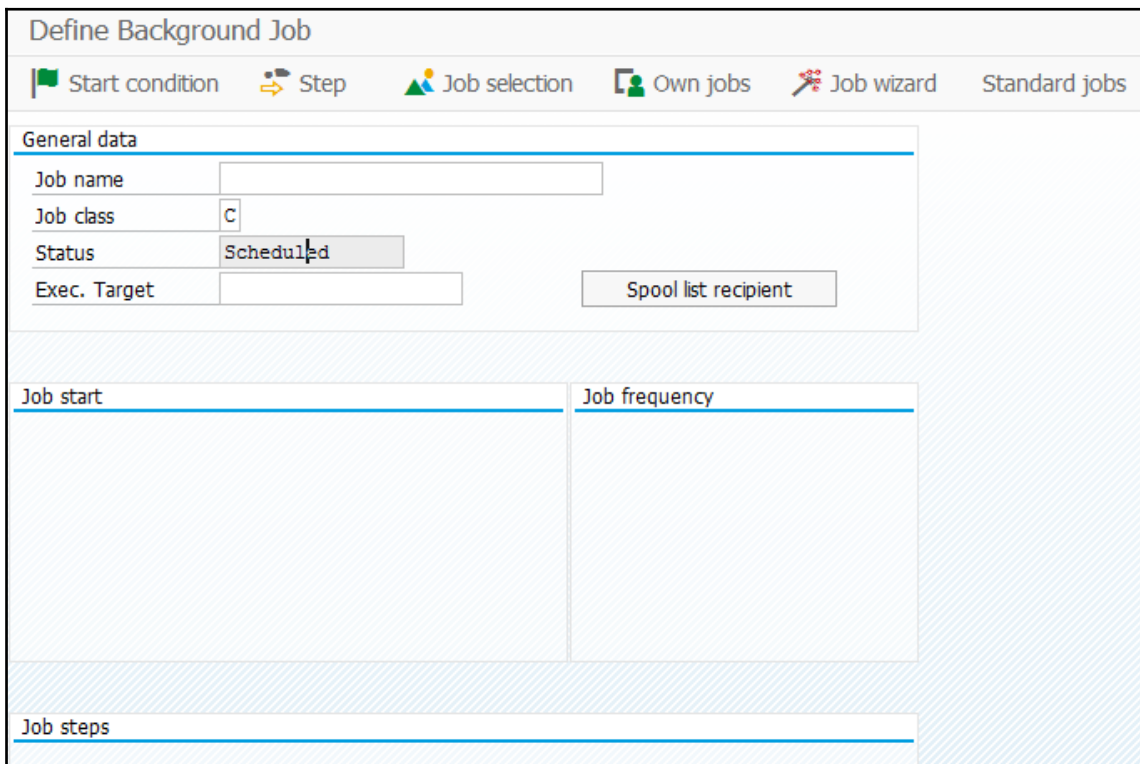
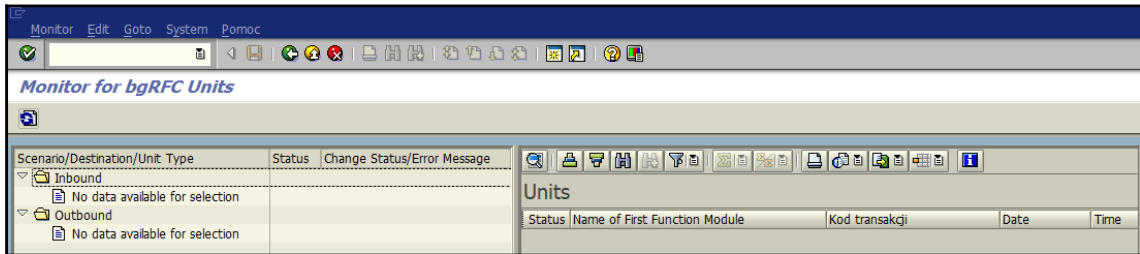
---

**OAuth enablement**

Enable OAuth for Service

---

# Chapter 15: The Background Processing of ABAP Programs



Define Background Job

Start condition  Step  Job selection

General Data

Job Name	ZTEST_BJ
----------	----------

Create Step 1

User

---

Program values

**ABAP program**

Name

Variant

Language

---

**External Command (command predefined by system administrator)**

Name

Parameters

OS

Target Server

---

**External Program (command entered directly by system administrator)**

Name

Parameters

Target Server

Step List Overview						
No.	Program name/command	Prog. type	Spool list	Parameters	User	Lang.
1	ZBACKGROUND_JOB	ABAP			WCIESIELSKI	EN

Start Time

Date/Time

Scheduled Start    Date: 2019-05-02    Time:   
 No Start After      Date:       Time:

After Job

Choose Time

HH    MM    SS

12 ▾ : 20 ▾ : 36 ▾

After Event

Periodic Job

### Define Background Job

Start condition   Step   Job selection   Own jobs   Job wizard

---

#### General Data

Job Name	ZTEST_BJ	
Job Class	C	
Status	Scheduled	
Exec. Target	<input type="text"/>	Spool List Recipient

---

<h4>Job Start</h4> <table><tr><td colspan="2">Planned Start</td></tr><tr><td>Date</td><td>2019-05-02</td></tr><tr><td>Time</td><td>12:20:36</td></tr></table>	Planned Start		Date	2019-05-02	Time	12:20:36	<h4>Job Frequency</h4> <table><tr><td> </td></tr></table>	
Planned Start								
Date	2019-05-02							
Time	12:20:36							

---

#### Job Steps

1 Step(s) defined
-------------------

### Simple Job Selection

Execute   
 Extended job selection   
 Information

Job Name:

User Name:

---

**Job Status**

Sched.   
  Released   
  Ready   
  Active   
  Finished   
  Canceled

---

**Job Start Condition**

From  To   
 From  To

or after event:

---

**Job Step**

ABAP Program Name:

Job Overview

Refresh   
 Release   
 Stop   
 Spool   
 Job log   
 Step   
 Application servers   
 1/2   
   
   
   

Job overview from: 2019-05-02 at: : :  
 to: 2019-05-03 at: : :

Selected job names: ZTEST\_BJ  
 Selected user names: WCIESIELSKI

Scheduled   
  Released   
  Ready   
  Active   
  Finished   
  Canceled

Event-Driven    Event ID:

ABAP program    Program name:

JobName	Spool	Job doc	Job CreatedB	Status	Start date	Start Time	Duration(sec.)	Delay (sec.)
<input type="checkbox"/> ZTEST_BJ			WCIESIELSKI	Finished	2019-05-02	12:21:34	0	58
*Summary							0	58

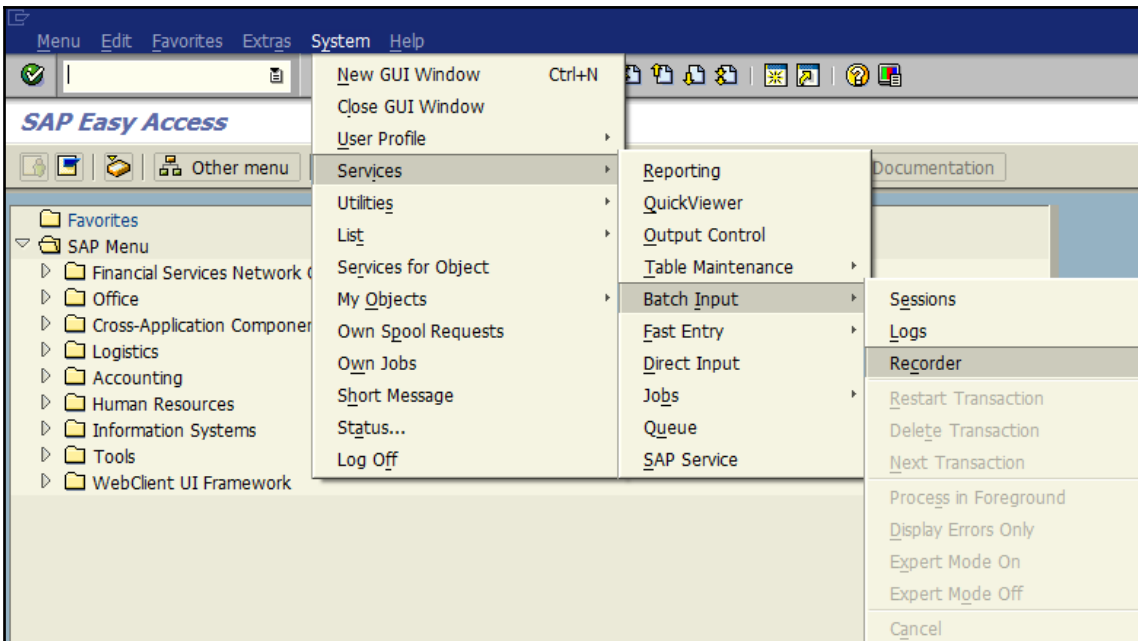


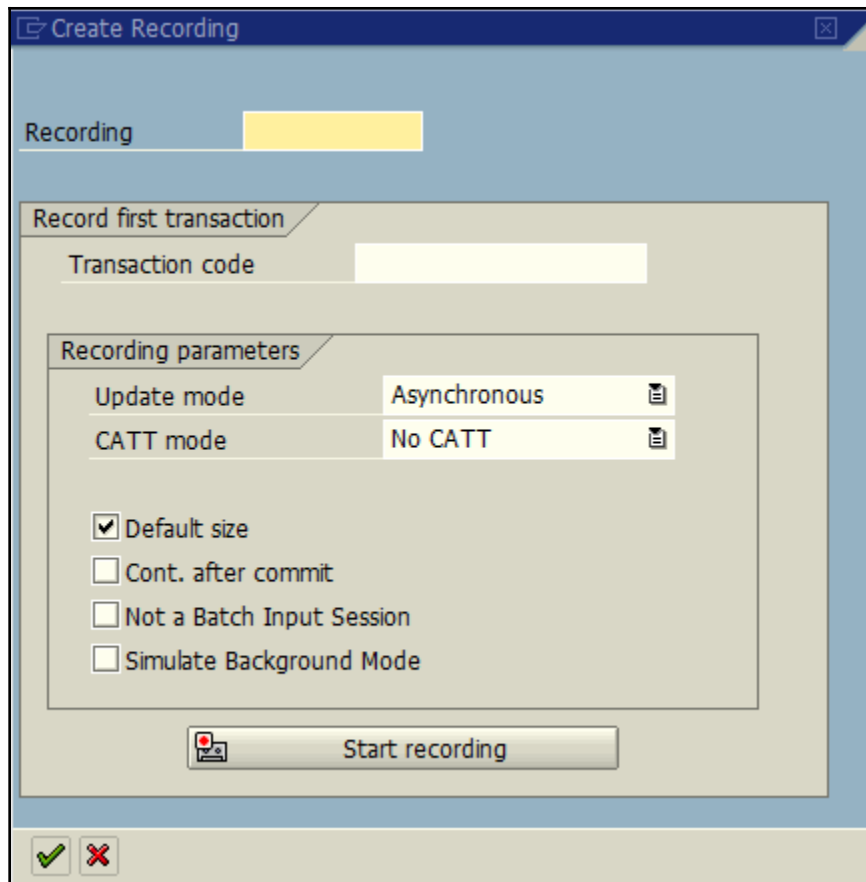
Job Log Entries for ZTEST\_BJ / 12161000

Long text Previous Page Next page

Job log overview for job: ZTEST\_BJ / 12161000

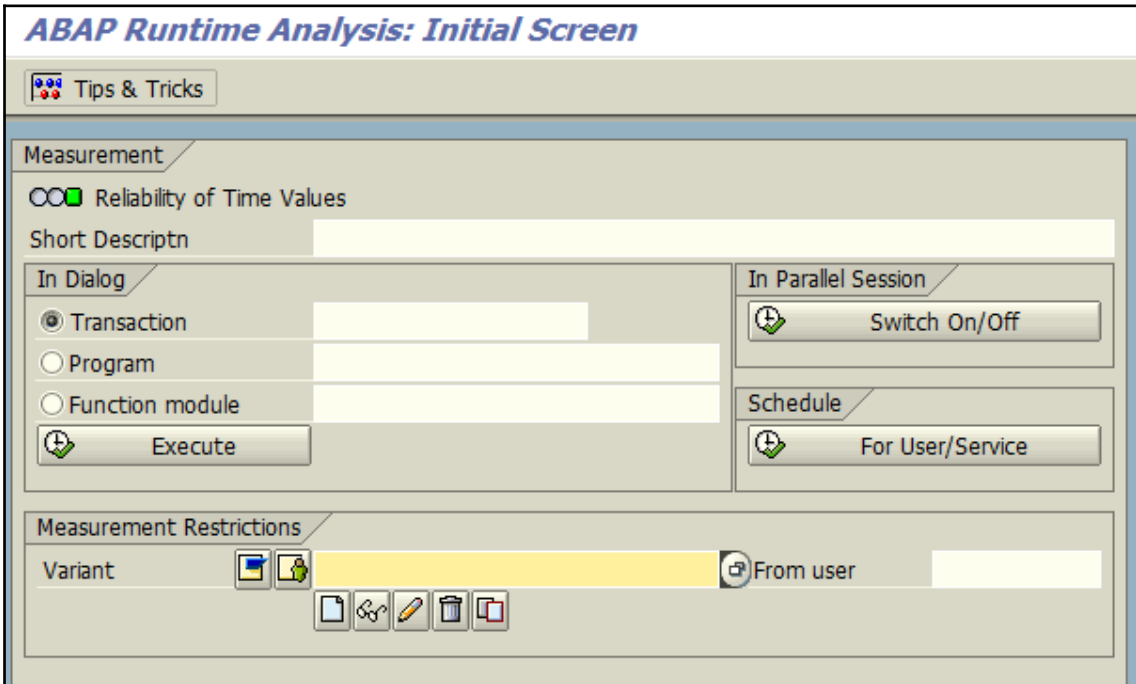
Date	Time	Message text	Message class	Message no.	Message type
2019-05-02	12:21:34	Job started	00	516	S
2019-05-02	12:21:34	Step 001 started (program ZBACKGROUND_JOB, variant , user ID WCIESIELSKI)	00	550	S
2019-05-02	12:21:34	Job finished	00	517	S

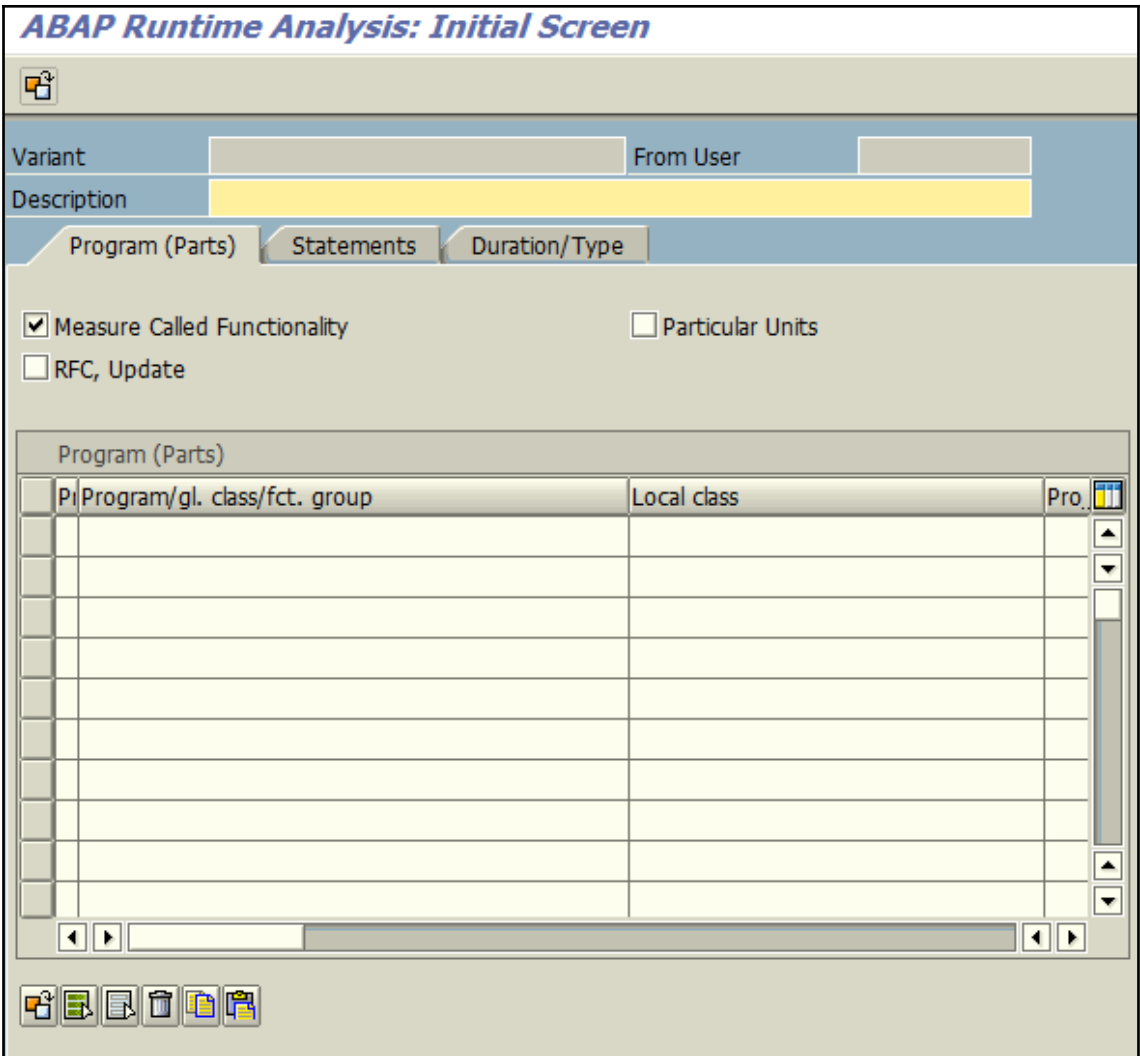





Line	Program	Screen	St...	Field name	Field value
1			T	MM03	
2	SAPLMGMM	0060	X		
3				BDC_CURSOR	RMMG1-MATNR
4				BDC_OKCODE	=ENTR
5				RMMG1-MATNR	MZ-PROC-MC-HT-3104
6	SAPLMGMM	0070	X		
7				BDC_CURSOR	MSICHTAUSW-DYTXT(02)
8				BDC_OKCODE	=ENTR
9				MSICHTAUSW-KZSEL (01)	X
10				MSICHTAUSW-KZSEL (02)	X
11	SAPLMGMM	4004	X		
12				BDC_OKCODE	=BABA
13				BDC_SUBSCR	SAPLMGMM 2004TABFRA1
14				BDC_SUBSCR	SAPLMGD1 1002SUB1
15				BDC_CURSOR	RMMG1-MATNR
16				BDC_SUBSCR	SAPLMGD1 2001SUB2
17				BDC_SUBSCR	SAPLMGD1 2561SUB3
18				BDC_SUBSCR	SAPLMGD1 2007SUB4
19				BDC_SUBSCR	SAPLMGD1 2005SUB5
20				BDC_SUBSCR	SAPLMGD1 2011SUB6
21				BDC_SUBSCR	SAPLMGD1 2033SUB7
22				BDC_SUBSCR	SAPLMGD1 0001SUB8
23				BDC_SUBSCR	SAPLMGD1 0001SUB9
24				BDC_SUBSCR	SAPLMGD1 0001SUB10

# Chapter 16: Performance and Optimization of ABAP Code





### ABAP Runtime Analysis: Initial Screen






Variant  From User

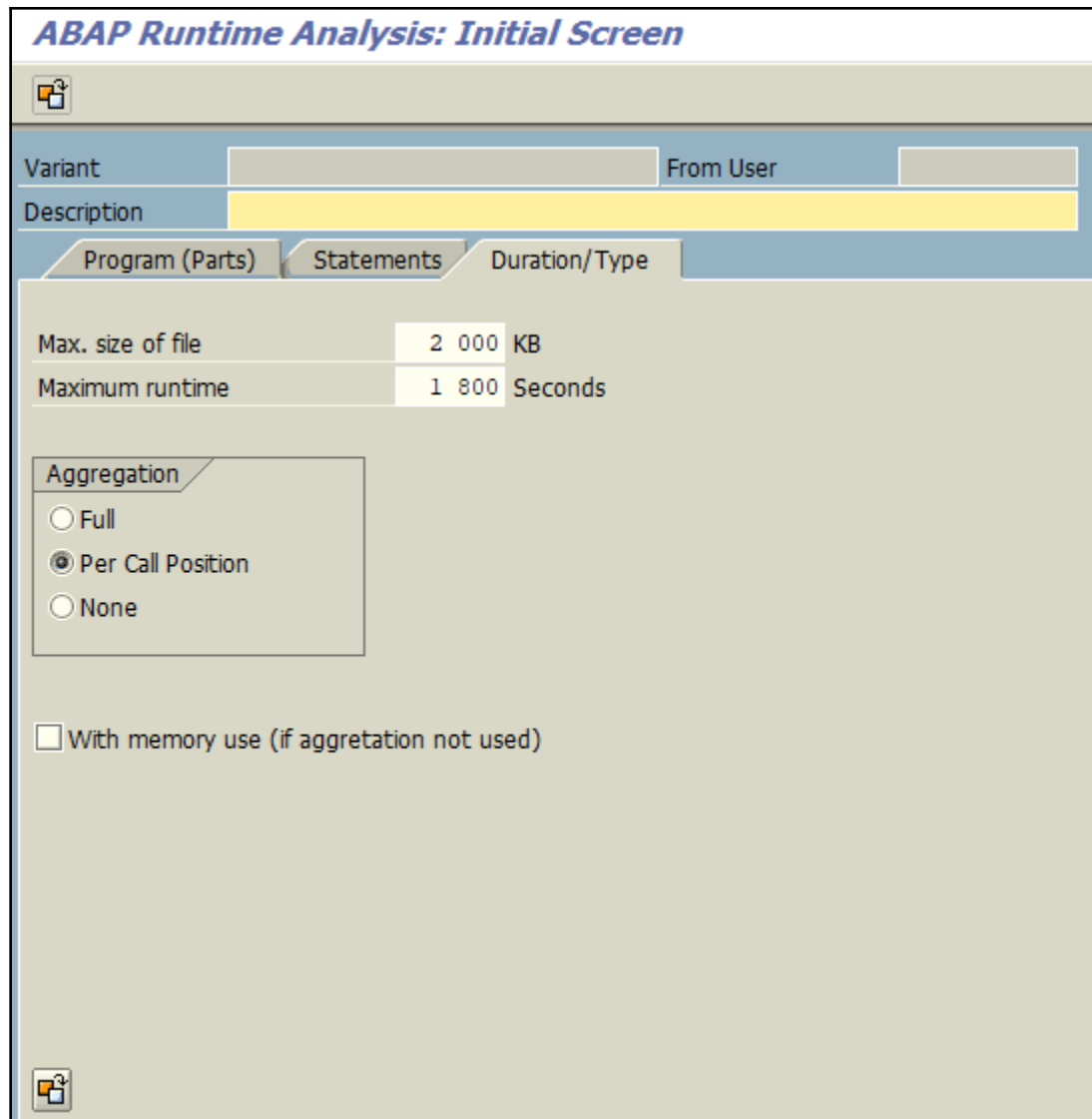
Description

**Program (Parts)** | Statements | Duration/Type

<b>Modularization Units</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Methods</li><li><input checked="" type="checkbox"/> Events (OO)</li><li><input checked="" type="checkbox"/> Function Modules</li><li><input checked="" type="checkbox"/> Subroutines</li></ul>	<b>Database accesses</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Open SQL</li><li><input checked="" type="checkbox"/> Native SQL</li><li><input checked="" type="checkbox"/> Contexts</li><li><input checked="" type="checkbox"/> DB-level ops</li></ul>	<b>Data transfer</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> EXPORT/IMPORT</li><li><input checked="" type="checkbox"/> DATASET</li></ul>
<b>Screen</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Flow logic</li><li><input checked="" type="checkbox"/> Formatting for frontend</li><li><input checked="" type="checkbox"/> Modules</li><li><input checked="" type="checkbox"/> Message handling</li></ul>	<input checked="" type="checkbox"/> Programs/ Transactions/C Routines	
<b>Internal tables</b> <ul style="list-style-type: none"><li><input type="checkbox"/> Read Operations</li><li><input type="checkbox"/> Change operations</li></ul>	<b>Generation/Loadng</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Generate</li><li><input checked="" type="checkbox"/> LOAD</li></ul>	
	<b>Miscellaneous</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> ASSIGN, PF-STATUS, SET LOCALE, ...</li><li><input checked="" type="checkbox"/> Statistics</li><li><input type="checkbox"/> Kernel-level runtime administration</li></ul>	

### ABAP Runtime Analysis: Initial Screen



The screenshot shows the 'ABAP Runtime Analysis: Initial Screen'. At the top, there is a title bar with a small icon on the left. Below the title bar, there are two input fields: 'Variant' and 'From User'. The 'Description' field is highlighted in yellow. Below these fields are three tabs: 'Program (Parts)', 'Statements', and 'Duration/Type'. The 'Duration/Type' tab is selected. Under this tab, there are two rows of data: 'Max. size of file' with a value of '2 000' and unit 'KB', and 'Maximum runtime' with a value of '1 800' and unit 'Seconds'. Below the data is a section titled 'Aggregation' with three radio buttons: 'Full', 'Per Call Position' (which is selected), and 'None'. At the bottom of this section, there is a checkbox labeled 'With memory use (if aggregation not used)'. A small icon is located in the bottom-left corner of the screen.

Variant  From User

Description

Program (Parts) Statements Duration/Type

Max. size of file 2 000 KB

Maximum runtime 1 800 Seconds

Aggregation

Full

Per Call Position

None

With memory use (if aggregation not used)

Performance Data File

Application	SE80		
Short description	Sample measurement		
Measurement date	2019-02-19	22:37:25	
File size in KB	1 493		

Evaluate   
 Other File...   
 File Info...   
 Delete...

### Runtime Analysis Evaluation: Overview

Transaction SE80 = Object Navigator      Time 20:43:32  
 Program SE80      Date 19-02-19  
 User

Execution time in microseconds:

ABAP	872 022	= 86,5%
Database	129 876	= 12,9%
System	5 729	= 0,6%
	1 007 627	= 100,0%

Statistics entry	Number
Conversions	16 495
Convert from type P	680
Convert to type P	959
Loaded programs	280



## Runtime Analysis Evaluation: Group Hit List



No.	Gross	Net	CALL METHOD
1	938 278	15	CL_WB_STARTUP=>START
1	937 442	34	CL_WB_STARTUP=>START_INTERNAL
1	934 507	39	CL_WB_MANAGER=>IF_WB_MANAGER~SET_WORKSPACE
1	934 335	63	CL_WB_MANAGER=>PROCESS_REQUEST_QUEUE
8	850 246	233	CL_WB_MANAGER=>PROCESS_WB_REQUEST
1	643 702	7	CL_WB_NAVIGATOR_VIS_AS_DYNPRO=>DO_THE_NAVIGATION
1	643 693	34	CL_WB_NAVIGATOR=>DO_THE_NAVIGATION
1	640 115	6	CL_WB_INITIAL=>IF_WB_PROGRAM~PROCESS_WB_REQUEST
1	640 109	7	CL_WB_INITIAL=>DISPLAY
1	457 779	1 005	CL_WB_INITIAL=>SHOW_CONTROLS
1	456 741	5	CL_WB_INITIAL=>SHOW_WB_PICTURE
1	455 539	455 420	CL_GUI_PICTURE=>LOAD_PICTURE_FROM_URL
7	204 160	70	CL_WB_NAVIGATOR=>DO_THE_NAVIGATION
1	159 739	15	CL_WB_REP_BROWSER_RADA=>IF_WB_PROGRAM~PROCESS_WB_REQUEST
1	84 662	43	CL_WB_REP_BROWSER_RADA=>DISPLAY
1	82 004	51	CL_WB_REP_BROWSER_VIS_RADA=>IF_WB_REPBROWSER_VIS~SHOW
1	75 053	7	CL_WB_REP_BROWSER_RADA=>GET_OBJECT_TREE_FROM_REQUEST
1	74 317	13	CL_WB_OBJECT_TREE_RADA=>CREATE_FROM_TREENAME
1	73 632	40	CL_WB_OBJECT_TREE_RADA=>CONSTRUCTOR
1	66 017	132	CL_WB_REP_BROWSER_VIS_RADA=>SHOW_TREE
1	59 588	46	CL_WB_BROWSER_SELECTION1=>IF_WB_BROWSER_SELECTION~SHOW_SELECTION
518	59 550	1 027	CL_WB_REGISTRY=>INITIALIZE
No.	Gross	Net	RAISE EVENT
1	58 961	8	CL_WB_MANAGER=>IF_WB_MANAGER~MANAGER_FINISHED
1	2 692	5	CL_GUI_CONTAINER_BAR_WB=>EMPTY
4	110	30	CL_GUI_CONTAINER_BAR_WB=>CLICKED
1	24	2	CL_WB_WINDOW_EVENTS=>WINDOW_ACTIVATED
1	7	4	CL_WB_MANAGER=>IF_WB_MANAGER~MANAGER_PBO_PROCESSED

**Runtime Analysis Evaluation: DB Tables**

Tab./View	#Access	Runtime	Class	Buffering	SQL tab.	Description	Package
EUOBJT	4	15 055	TRANSP	Single rec		Workbench: Development Objects	SEU
SEOCOMPO	192	11 428	TRANSP			Class/Interface component	SEO
SEOSUBCODF	36	10 451	TRANSP			Definition class/interface subcomponent	SEO
SEOCOMPODF	60	10 084	TRANSP			Definition class/interface component	SEO
OBJH	4	8 822	TRANSP	Single rec		Object: Header	SCIS_OBJ
BDSPHIO2	63	6 855	TRANSP			BDS: Instances of Physical Information Objects	SBDS
SEOSUBCO	64	4 395	TRANSP			Class/interface subcomponent	SEO
EUOBJEDIT	8	3 336	TRANSP	full		Workbench: Assignment Development Object Type -> Editor	SEU
OBJT	4	3 131	TRANSP			Description of Type T Objects (Separate Transaction)	SCIS_OBJ
BDSPHF2	32	2 756	TRANSP			BDS: Files of Physical Information Objects	SBDS
EUOBJ	6	2 872	TRANSP	full		Workbench: Development Objects	SEU
WFTOOLTYPE	160	2 156	TRANSP	full		Visualization types for tools	SWBM_INTERNAL
SEOSUBCOTX	36	2 003	TRANSP	generic		Class/interface subcomponent short description	SEO
BDS_CONN05	20	1 957	TRANSP			BDS: Link Table Default for Undefined Classes	SBDS
EUOBJV	4	1 946	VIEW	full		Generated Table for View	SEU
RSEUMOD	2	1 833	TRANSP			Settings for ABAP Workbench	SEU
BDSPHPR2	20	1 822	TRANSP			BDS: Attributes of Physical Information Objects	SBDS
BDSPHRE2	20	1 734	TRANSP			BDS: Outgoing Relationships of Physical Information Objects	SBDS
WBREGISTRY	4	1 716	TRANSP	full		Registry ABAP Workbench	SWBM_INTERNAL
BDSCHK02	20	1 688	TRANSP			BDS: Check out Data for a Physical Information Object	SBDS
BDSLOI02	5	1 604	TRANSP			BDS: Instances of Logical Information Objects	SBDS
BDSLOI0T2	20	1 596	TRANSP			BDS: Descriptions of Logical Information Objects	SBDS
TOLE	216	1 592	TRANSP	full		OLE Applications	SOLE
SEOCOMPOTX	64	1 429	TRANSP	generic		Short description class/interface component	SEO
DIRTREE	7	1 288	TRANSP			Tree administration	SEU

**Runtime analysis evaluation: Class hit list**

Object Type Name	No.	Gross	Net	Gross (%)	Net (%)	Program Name
CL_WB_STARTUP	2	1 875 720	49	186,2	0,0	SAPLWB_MANAGER
CL_WB_MANAGER	47	1 815 371	791	180,2	0,1	CL_WB_MANAGER=====CP
CL_WB_INITIAL	2	1 096 850	12	108,9	0,0	CL_WB_INITIAL=====CP
CL_WB_MANAGER	2	937 275	45	93,0	0,0	CL_WB_STARTUP=====CP
CL_WB_NAVIGATOR_VIS_AS_DYNPRO	1	643 702	7	63,9	0,0	CL_WB_MANAGER=====CP
CL_WB_NAVIGATOR	1	643 693	34	63,9	0,0	CL_WB_NAVIGATOR_VIS_AS_DYNPRO=CP
CL_WB_INITIAL	1	640 115	6	63,5	0,0	CL_WB_NAVIGATOR=====CP
CL_WB_INITIAL	1	457 779	1 005	45,4	0,1	SAPLWB_INITIAL_TOOL
CL_GUI_PICTURE	3	456 000	455 881	45,3	45,2	SAPLWB_INITIAL_TOOL
CL_WB_REP_BROWSER_RADA	7	219 396	97	21,8	0,0	CL_WB_REP_BROWSER_RADA=====CP
CL_WB_NAVIGATOR	15	204 185	95	20,3	0,0	CL_WB_MANAGER=====CP
CL_WB_REP_BROWSER_RADA	1	159 739	15	15,9	0,0	CL_WB_NAVIGATOR=====CP
CL_WB_REP_BROWSER_VIS_RADA	3	141 234	1 663	14,0	0,2	CL_WB_REP_BROWSER_RADA=====CP
CL_WB_REP_BROWSER_VIS_RADA	9	84 559	5 353	8,4	0,5	CL_WB_REP_BROWSER_VIS_RADA====CP
CL_WB_OBJECT_TREE_RADA	1	74 317	13	7,4	0,0	CL_WB_REP_BROWSER_RADA=====CP
CL_WB_OBJECT_TREE_RADA	1	73 632	40	7,3	0,0	CL_WB_OBJECT_TREE_RADA=====CP
CL_WB_WINDOW	58	71 319	4 763	7,1	0,5	CL_WB_WINDOW_MANAGER=====CP
CL_WB_REGISTRY	1 560	71 234	8 129	7,1	0,8	CL_WB_REGISTRY=====CP
CL_WB_BROWSER_SELECTION1	3	69 528	1 510	6,9	0,1	CL_WB_REP_BROWSER_VIS_RADA====CP
CL_WB_WINDOW	15	67 437	3 061	6,7	0,3	CL_WB_WINDOW=====CP
CL_GUI_CONTAINER_BAR_WB	25	63 339	21 783	6,3	2,2	CL_WB_WINDOW=====CP
CL_WB_REGISTRY_SHM_METADATA	1 272	61 868	16 239	6,1	1,6	CL_WB_REGISTRY_SHM_METADATA===CP
CL_WB_REGISTRY	98	60 126	614	6,0	0,1	CL_WB_OBJECT_TYPE=====CP
CL_WB_OBJECT_TYPE	3	58 972	69	5,9	0,0	SAPLWB_MANAGER

**Runtime Analysis Evaluation: Instance Hit List**

Inst.	Object Type Name	No.	Gross	Net	Gross (%)	Net (%)	Program Name
41	CL_WB_MANAGER	47	1 815 371	791	180,2	0,1	CL_WB_MANAGER=====CP
283	CL_WB_INITIAL	2	1 096 850	12	108,9	0,0	CL_WB_INITIAL=====CP
0	CL_WB_STARTUP	1	938 278	15	93,1	0,0	SAPLWB_MANAGER
9	CL_WB_STARTUP	1	937 442	34	93,0	0,0	SAPLWB_MANAGER
41	CL_WB_MANAGER	1	934 507	39	92,7	0,0	CL_WB_STARTUP=====CP
280	CL_WB_NAVIGATOR_VIS_AS_DYNPRO	1	643 702	7	63,9	0,0	CL_WB_MANAGER=====CP
280	CL_WB_NAVIGATOR	1	643 693	34	63,9	0,0	CL_WB_NAVIGATOR_VIS_AS_DYNPRO=CP
283	CL_WB_INITIAL	1	640 115	6	63,5	0,0	CL_WB_NAVIGATOR=====CP
283	CL_WB_INITIAL	1	457 779	1 005	45,4	0,1	SAPLWB_INITIAL_TOOL
286	CL_GUI_PICTURE	3	456 000	455 881	45,3	45,2	SAPLWB_INITIAL_TOOL
123	CL_WB_REP_BROWSER_RADA	7	219 396	97	21,8	0,0	CL_WB_REP_BROWSER_RADA=====CP
65	CL_WB_NAVIGATOR	2	190 008	31	18,9	0,0	CL_WB_MANAGER=====CP
123	CL_WB_REP_BROWSER_RADA	1	159 739	15	15,9	0,0	CL_WB_NAVIGATOR=====CP
67	CL_WB_REP_BROWSER_VIS_RADA	3	141 234	1 663	14,0	0,2	CL_WB_REP_BROWSER_RADA=====CP
67	CL_WB_REP_BROWSER_VIS_RADA	9	84 559	5 353	8,4	0,5	CL_WB_REP_BROWSER_VIS_RADA=====CP
0	CL_WB_OBJECT_TREE_RADA	1	74 317	13	7,4	0,0	CL_WB_REP_BROWSER_RADA=====CP
126	CL_WB_OBJECT_TREE_RADA	1	73 632	40	7,3	0,0	CL_WB_OBJECT_TREE_RADA=====CP
35	CL_WB_REGISTRY	1 510	71 127	8 023	7,1	0,8	CL_WB_REGISTRY=====CP
99	CL_GUI_CONTAINER_BAR_WB	25	63 339	21 783	6,3	2,2	CL_WB_WINDOW=====CP

**Runtime Analysis Evaluation: Method Hitlist**

S/I	CL.	Interface Component	No.	Gross	Net	Gross (%)	Net (%)	Program Name
1	CL_WB_STARTUP	START	1 938 278	15	93,1	0,0	SAPLWB_MANAGER	
2	CL_WB_STARTUP	START_INTERNAL	1 937 442	34	93,0	0,0	SAPLWB_MANAGER	
3	CL_WB_MANAGER	IF_WB_MANAGER-SET_WORKSPACE	1 934 507	39	92,7	0,0	CL_WB_STARTUP=====CP	
4	CL_WB_MANAGER	PROCESS_REQUEST_QUEUE	1 934 335	63	92,7	0,0	CL_WB_MANAGER=====CP	
5	CL_WB_MANAGER	PROCESS_WB_REQUEST	8 850 246	233	84,4	0,0	CL_WB_MANAGER=====CP	
6	CL_WB_NAVIGATOR_VIS_AS_DYNPRO	DO_THE_NAVIGATION	1 643 702	7	63,9	0,0	CL_WB_MANAGER=====CP	
7	CL_WB_NAVIGATOR	DO_THE_NAVIGATION	1 643 693	34	63,9	0,0	CL_WB_NAVIGATOR_VIS_AS_DYNPRO=CP	
8	CL_WB_INITIAL	IF_WB_PROGRAM-PROCESS_WB_REQUEST	1 640 115	6	63,5	0,0	CL_WB_NAVIGATOR=====CP	
9	CL_WB_INITIAL	DISPLAY	1 640 109	7	63,5	0,0	CL_WB_INITIAL=====CP	
10	CL_WB_INITIAL	SHOW_CONTROLS	1 457 779	1 005	45,4	0,1	SAPLWB_INITIAL_TOOL	
11	CL_WB_INITIAL	SHOW_WB_PICTURE	1 456 741	5	45,3	0,0	CL_WB_INITIAL=====CP	
12	CL_GUI_PICTURE	LOAD_PICTURE_FROM_URL	1 455 539	455 420	45,2	45,2	SAPLWB_INITIAL_TOOL	
13	CL_WB_NAVIGATOR	DO_THE_NAVIGATION	7 204 160	70	20,3	0,0	CL_WB_MANAGER=====CP	
14	CL_WB_REP_BROWSER_RADA	IF_WB_PROGRAM-PROCESS_WB_REQUEST	1 159 739	15	15,9	0,0	CL_WB_NAVIGATOR=====CP	
15	CL_WB_REP_BROWSER_RADA	DISPLAY	1 84 662	43	8,4	0,0	CL_WB_REP_BROWSER_RADA=====CP	
16	CL_WB_REP_BROWSER_VIS_RADA	IF_WB_REPBROWSER_VIS-SHOW	1 82 004	51	8,1	0,0	CL_WB_REP_BROWSER_RADA=====CP	
17	CL_WB_REP_BROWSER_RADA	GET_OBJECT_TREE_FROM_REQUEST	1 75 053	7	7,4	0,0	CL_WB_REP_BROWSER_RADA=====CP	

**Runtime Analysis Evaluation: Event Hit List**

S/I	CL.	Interface Component	No.	Gross	Net	Gross (%)	Net (%)	Program Name
1	CL_WB_MANAGER	IF_WB_MANAGER-MANAGER_FINISHED	1 58 961	8	5,9	0,0	CL_WB_MANAGER=====CP	
2	CL_GUI_CONTAINER_BAR_WB	EMPTY	1 2 692	5	0,3	0,0	CL_GUI_CONTAINER_BAR_WB=====CP	
3	CL_GUI_CONTAINER_BAR_WB	CLICKED	4 110	30	0,0	0,0	CL_GUI_CONTAINER_BAR_WB=====CP	
4	CL_WB_WINDOW_EVENTS	WINDOW_ACTIVATED	1 24	2	0,0	0,0	CL_WB_WINDOW_EVENTS=====CP	
5	CL_WB_MANAGER	IF_WB_MANAGER-MANAGER_PBO_PROCESSED	1 7	4	0,0	0,0	CL_WB_MANAGER=====CP	

**Runtime Analysis Evaluation: Internal Table Hit List**

Int. tab.	No.	Gross	=	Net	Gross (%)	Net (%)	Program
List contains no data							

Gross	Net	Lv	Call Hierarchy	Program	Mem. Reqmt (B)
	70	2	Load Report SAPLWB_CUSTOMIZING	SAPLWB_MANAGER	795 920
2 245	67	2	CALL FUNCTION RS_WORKBENCH_CUSTOMIZING	SAPLWB_MANAGER	1 060 048
	2	3	IMPORT FROM MEMORY RSEUMOD	SAPLWB_CUSTOMIZING	1 135 008
	1 201	3	SELECT SINGLE RSEUMOD	SAPLWB_CUSTOMIZING	1 135 008
	26	3	EXPORT TO MEMORY RSEUMOD	SAPLWB_CUSTOMIZING	1 135 008
	13	3	Load Report SAPLSTR9	SAPLWB_CUSTOMIZING	1 137 312
936	8	3	CALL FUNCTION TR_SYS_PARAMS	SAPLWB_CUSTOMIZING	1 138 016
	3	4	SUPPLY GCON_TR_SYS_PARAMS	SAPLSTR9	1 138 016
925	96	4	DEMAND GCON_TR_SYS_PARAMS	SAPLSTR9	1 138 016
	8	5	Load Report CONTEXT_X_TR_SYS_PARAMS	SAPLSTR9	1 138 016
	22	5	READ TABLE TCONT	CONTEXT_X_TR_SYS_PARAMS	1 139 696
799	15	5	CALL FUNCTION TR_SYS_PARAMS_CONTEXT_MODULE	CONTEXT_X_TR_SYS_PARAMS	1 145 184
	426	6	SELECT SINGLE TADIR	SAPLSCTS_SYSTEM_CONTEXT	1 145 184
	5	6	CALL C_C_SAPGPARAM	SAPLSCTS_SYSTEM_CONTEXT	1 145 184
	353	6	SELECT SINGLE T000	SAPLSCTS_SYSTEM_CONTEXT	1 145 184
	13	2	Load Report CL_WB_REQUEST=====CP	SAPLWB_MANAGER	1 154 080
59 282	73	2	CALL FUNCTION WB_GET_BROWSER_REQUESTS	SAPLWB_MANAGER	1 154 272
70	21	3	CALL METHOD CL_WB_REQUEST->CONSTRUCTOR	SAPLWB_MANAGER	1 154 752
	13	4	Load Report CL_WB_OPERATION=====CP	CL_WB_REQUEST=====CP	1 155 040
36	8	4	CALL METHOD CL_WB_OPERATION->CONSTRUCTOR	CL_WB_REQUEST=====CP	1 155 920
	28	5	SELECT SINGLE WBACTIONS	CL_WB_OPERATION=====CP	1 155 920

Trace & collect

Traces on/off Collect ext. traces Statistical records

Trace for User / Tasks Workprocess Current mode Schedule >

Comment

Server

Username  (Perf.trace for user)

Tasktype \*  No. trace activations 5

			Sql	E...	R...	Server	<input type="text"/>
							<input type="text"/>
							<input type="text"/>

Start trace

**ABAP trace**

Options  Particular units Further opt.

with internal tables

Size&Duration  Large (20 MB / 4200 sec max.)

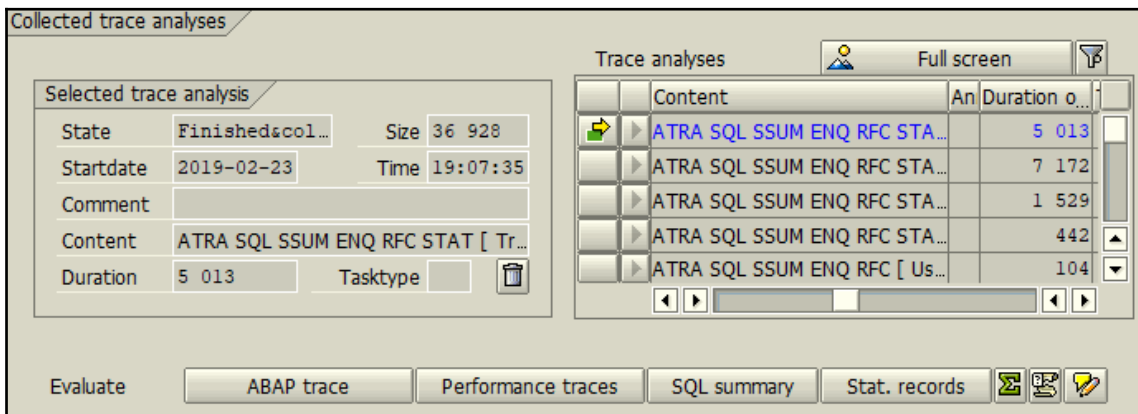
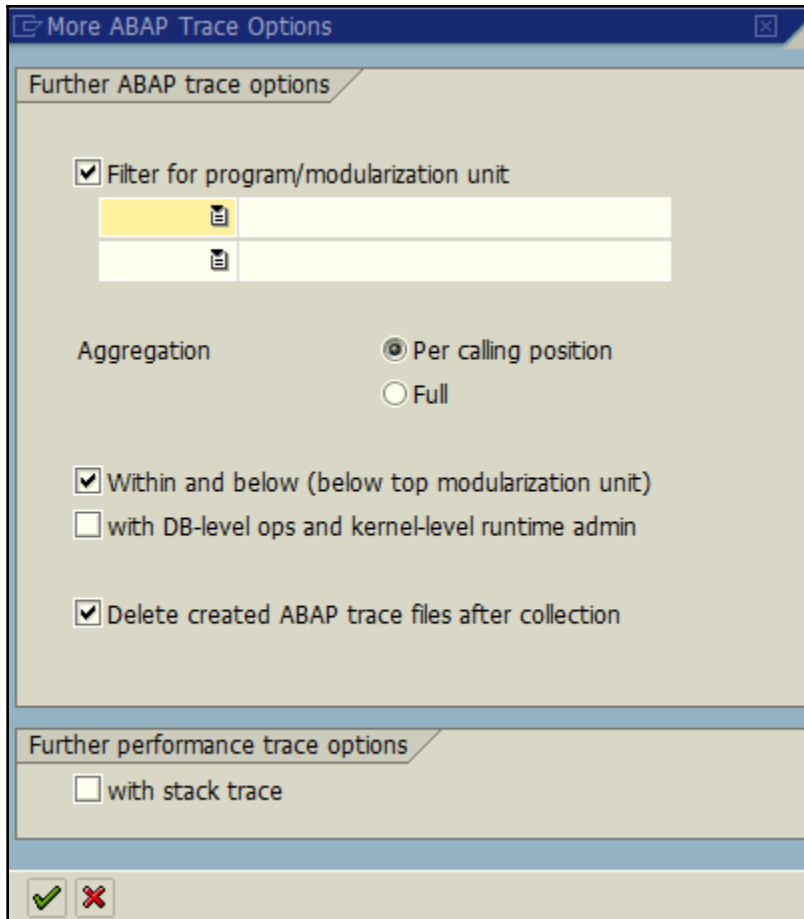
Clock type  Auto  High /  Low

**Performance traces**

SQL  RFC  Enqueue

Statistical records (top 20)

Context trace  (RFC,Upd)



**Trace analysis 2019-02-19(1) - ABAP Trace Per Call**

Transaction SE80 = Object Navigator  
Traced user

Execution times in microseconds

ABAP	1 401 410	=	91,7%
Database	121 976	=	8,0%
System	5 443	=	0,4%
<b>Total</b>	<b>1 528 829</b>	=	<b>100,0%</b>

Call	No.	Gross	Net	Gross (%)	Net (%)	Program (called program)
Runtime analysis	1	1 528 829	0	100,0	0,0	
CALL TRANSACTION SE80	1	1 528 656	1 132	100,0	0,1	Testframe
Program SAPMSEU0	1	1 527 524	233	99,9	0,0	
System Event <Generic Identifier>	5	1 523 213	39	99,6	0,0	SAPMSEU0
Dynpro Entry PROCESS DARK	1	1 522 909	64	99,6	0,0	SAPMSSY0
PAI Dynpro 1000	2	1 522 662	11	99,6	0,0	SAPMSSY0
CALL FUNCTION WB_NEW_WORKBENCH_START	1	1 522 544	33	99,6	0,0	SAPLWB_MANAGER
CALL METHOD CL_WB_STARTUP=>START	1	1 422 895	12	93,1	0,0	CL_WB_STARTUP=====
CALL FUNCTION WB_MANAGER_START	1	1 422 882	12	93,1	0,0	SAPLWB_MANAGER
CALL SCREEN 0200	1	1 422 870	51	93,1	0,0	SAPLWB_MANAGER
Dynpro Entry <Generic Identifier>	2	1 422 819	127	93,1	0,0	SAPLWB_MANAGER
PAI Dynpro 0200	2	1 422 192	9	93,0	0,0	SAPLWB_MANAGER
Module PAI MANAGER START	1	1 422 126	8	93,0	0,0	SAPLWB_MANAGER
CALL METHOD CL_WB_STARTUP=>START_INTERNAL	1	1 422 116	6	93,0	0,0	CL_WB_STARTUP=====
CALL METHOD CL_WB_MANAGER=>IF_WB_MANAGER-SET_WORKS	1	1 418 711	19	92,8	0,0	CL_WB_MANAGER=====
CALL METHOD CL_WB_MANAGER=>PROCESS_REQUEST_QUEUE	1	1 418 597	20	92,8	0,0	CL_WB_MANAGER=====
LOOP AT ME->REQUEST_QUEUE	1	1 334 057	42	87,3	0,0	CL_WB_MANAGER=====

**Performance Analysis: Trace Display (Main Records)**

hh:mm:ss...	Σ Duration	Σ Records	Program Name	Object Name	Statement
	<b>1 454 168</b>	<b>29 439</b>			
	198	0			OTHER (SQL)
19:18:24.403	76 285	0	R_ST05_TRACE_MAIN		COMMIT (forced)
19:18:24.484	293	1	WPBHELP_REGISTRATION	WPBHELP_URL	SELECT WHERE "MANDT" =
19:18:24.487	594	1	SAPLWB_CUSTOMIZING	RSEUMOD	SELECT WHERE "UNAME" =
19:18:24.491	10 252	1 257	SAPLTR_OBJECTS	OBJH	SELECT WHERE "OBJECTTYP
19:18:24.499	4 053	1	SAPMSSYC	USR02	SELECT WHERE "MANDT" =
19:18:24.501	2 799	1 255	SAPLTR_OBJECTS	OBJT	SELECT WHERE "OBJECTTY
19:18:24.518	56	0	SAPMSSYC		COMMIT
19:18:24.519	8 081	1 257	SAPLTR_OBJECTS	OBJH	SELECT WHERE "OBJECTTYP
19:18:24.520	1 418	823	CL_WB_REGISTRY_SHM_METADAT...	WBREGISTRY	SELECT
19:18:24.525	1 435	661	CL_WB_REGISTRY_SHM_METADAT...	EUOBJ	SELECT
19:18:24.528	2 039	924	SAPLTR_OBJECTS	OBJT	SELECT WHERE "OBJECTTY
19:18:24.529	17 213	7 965	CL_WB_REGISTRY_SHM_METADAT...	EUOBJT	SELECT

**SQL Statement with no parameters**

Full Screen On/Off | Display <-> Change | Explain | ABAP code | Table detail | SSMS | XML

Connected to: [Database Name] [Server Name] [User Name]

SQL Code | Explain Tree | Text Explain

Explain method: Estimated execution plan for statement with literals

Statement Text	Logical Operation	Argument	Est. I/O Cost
Query Plan			
SELECT		1	
Merge Join	Inner Join		
Clustered Index Scan	Clustered Index Scan	[EUOBJEDIT].[EUOBJEDIT~0]	0,003865740
Sort	Sort	ORDER BY: [EUOBJ].TYPE ASC	0,011261300
Clustered Index Scan	Clustered Index Scan	[EUOBJ].[EUOBJ~0]	0,003865740


Property	Value
Statement Text	SELECT "ID", "E071", "TADIR"
Argument	1
Estimated Rows	480,78700000000
Average Row Size	0
Total Subtree Cost	0,0383023000000
Operation Type	SELECT
Estimated Executions	0

```

SELECT "ID", "E071", "TADIR"
FROM "EUOBJV" /* R3:SAPLSEWB_CONTROL:21280 T:EUOBJV M:800 */ /*unc. rd.*/
    
```



### Runtime Analysis



Variant  From User

Description

**Duration and Type** | Statements | Program Parts

---

**Size Limits**

Maximum Size of File	<input type="text" value="10 000"/> KB
Maximum Execution Time	<input type="text" value="1 800"/> Seconds

**Aggregation**

None


Per Call Position

**Options**



Measure RFC and Update Calls

Explicit Switching On and Off of Measurement

Measure Memory Use

 Default Setting

**Runtime Analysis**

Variant  From User

Description

**Duration and Type**   **Statements**   **Program Parts**

---

**Limitation of the Measurement**

- No Limitation of the Measurement
- Limitation according to definition in the Hotspot Monitor
- Limitation on Program Components






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**Program Parts**

Measure functions called by specified program parts

Program Parts				
Pro...	Program/Class/Function Group	Local class	Pr...	Procedure

< > ...

Variant: ZVARIANT From User: WCIESIELSKI  
Description: ZVARIANT

Duration and Type | **Statements** | Program Parts

**Processing Blocks**

- Methods
- Events (ABAP Objects)
- Function Modules
- Subroutines

**Database Accesses**

- Open SQL
- Native SQL
- Contexts
- Database-Related Operations

**Screen**

- Flow Logic
- Formatting for frontend
- Modules
- Message Handling

**Data Transfer**

- EXPORT/IMPORT
- DATASET

**Internal Tables**

- Read Operations
- Change Operations

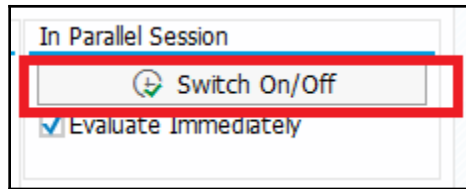
**Miscellaneous**

- Additional ABAP Statements
- Statistics
- Kernel Runtime Administration
- C calls

**Generate and Load**

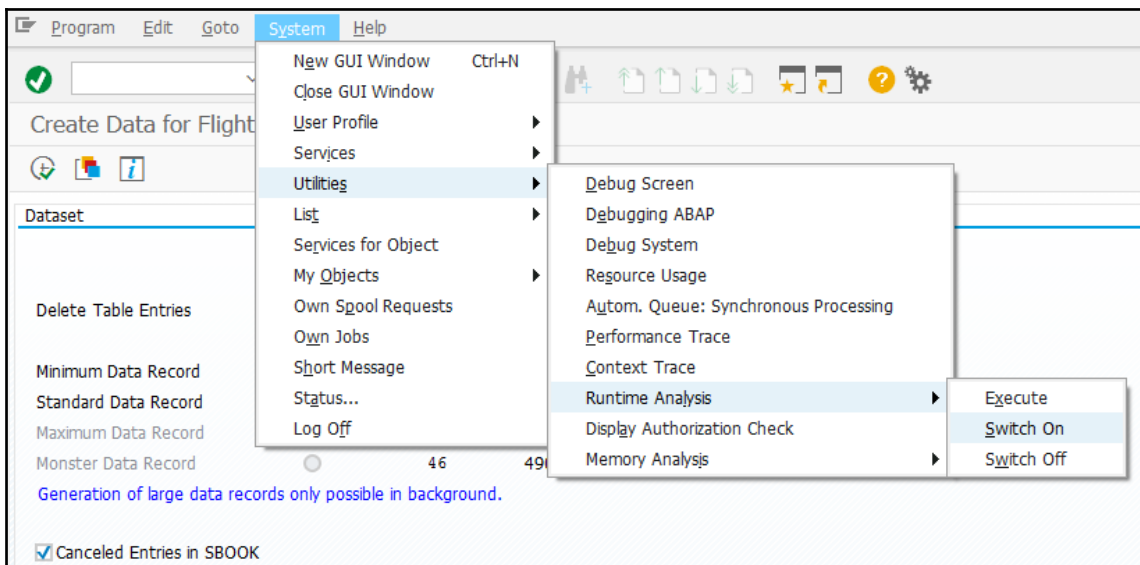
- GENERATE
- LOAD

Navigation icons: Home, Back, Forward, Refresh, Print, Help



Switching measurement on/off for process (Local Server)

Number	On	Type	Status	Reason	Time	User	Names	Report	Action	Table	KB	Name
8		DIA	Running			800	WCIESIELSKI	SAPLTHFB				
11		DIA	Running			800	WCIESIELSKI	SAPBC_DATA_GENERATOR				



Runtime Analysis: Display Measurement

Date/Time 19-05-06 / 11:30:41 Object SAPBC\_DATA\_GENERATOR System #14

User WCIESIELSKI Description ZVARIANT

Desktop 1 Hit List DB tables Prof. Times

### Profile: Trace Results

Profile	Selec...	Number	Net [microsec]	Net [%]
Runtime Measurement	<input type="checkbox"/>	241 682	12 708 108	100,00
Internal Processing Blocks	<input type="checkbox"/>	187 018	4 551 692	35,82
External Processing Blocks	<input type="checkbox"/>	47	30 051	0,24
Remote Function Call	<input type="checkbox"/>	47	30 051	0,24
Data Accesses Internal	<input type="checkbox"/>	35 431	1 365 896	10,75
Data Accesses External	<input type="checkbox"/>	1 057	3 782 025	29,76
Miscellaneous	<input type="checkbox"/>	18 120	2 978 223	23,44
Load / Generate	<input type="checkbox"/>	8	221	<0,01
Runtime Analyse	<input type="checkbox"/>	1	0	0,00

### Hit List

Hits	Gross [microsec]	Net [microsec]	Gross [%]	Net [%]	Statement/Event	Program Called
277	3 664 923	3 664 923	28,82	28,84	DB: Exec <Generic Identifier>	SAPBC_DATA_GENERATOR SA
17 333	2 972 761	2 972 761	23,37	23,39	Call C THNGet	SAPLSH3
45	4 129 912	2 234 625	32,47	17,58	Perform FILL_ISBOOK	SAPBC_DATA_GENERATOR SA
65	894 142	894 142	7,03	7,04	Commnt Work	SAPBC_DATA_GENERATOR SA
1	667 158	627 949	5,25	4,94	Perform DEFINE_MEALS	SAPBC_DATA_GENERATOR SA
6 178	352 394	266 917	2,77	2,10	Call Function SAPBC_GLOBAL_FOREIGN_CURRENCY	SAPBC_DATA_GENERATOR SA
17 333	3 315 071	229 018	26,06	1,80	Perform LOCAL_BUFFER	SAPLSH3
45	376 680	202 664	2,96	1,59	Perform FILL_ISBOOK	SAPBC_DATA_GENERATOR SA
11 205	1 596 045	167 130	12,55	1,32	Call Function NUMBER_GET_NEXT	SAPBC_DATA_GENERATOR SA
17 333	165 580	165 580	1,30	1,30	DB Buffer: Get TABL_GET(Q)	SAPLSH3 SA
45	301 972	130 845	2,37	1,03	Perform FILL_ISBOOK	SAPBC_DATA_GENERATOR SA
11 205	127 968	127 968	1,01	1,01	Perform RANDOM_I4	SAPBC_DATA_GENERATOR SA
44	2 311 480	112 037	18,17	0,88	Insert SBOOK	SAPBC_DATA_GENERATOR SA
11 205	93 340	93 340	0,73	0,73	Perform RANDOM_I4	SAPBC_DATA_GENERATOR SA
17 333	73 674	73 674	0,58	0,58	Perform WRITE_CHECK	SAPLSH3 SA
17 333	223 477	57 697	1,76	0,46	Select Single THRO	SAPLSH3 SA
1	57 302	57 302	0,45	0,45	Commnt Work	SAPBC_DATA_GENERATOR SA
4 687	2 029 249	54 388	15,95	0,43	Call Function NUMBER_GET_NEXT	SAPBC_DATA_GENERATOR SA

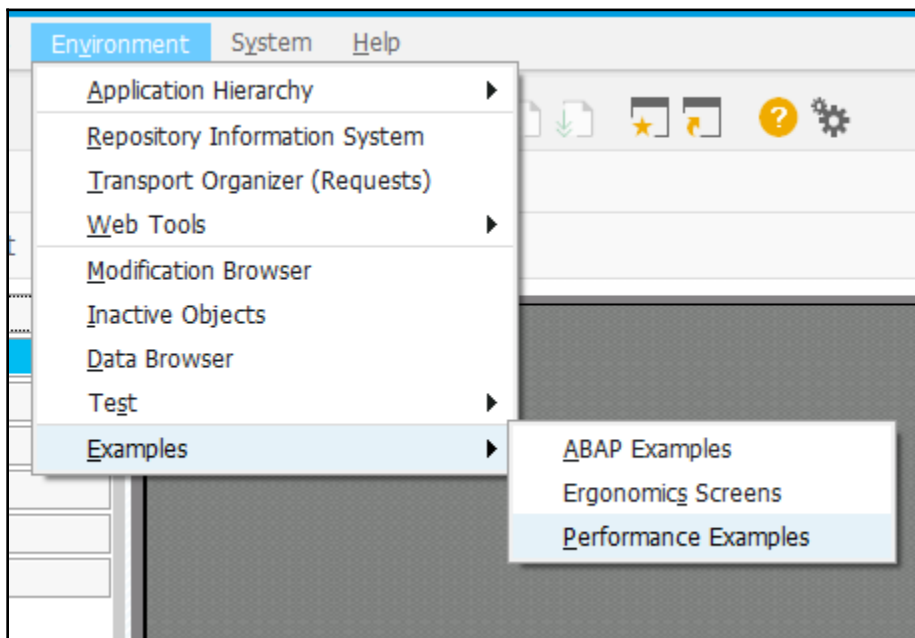
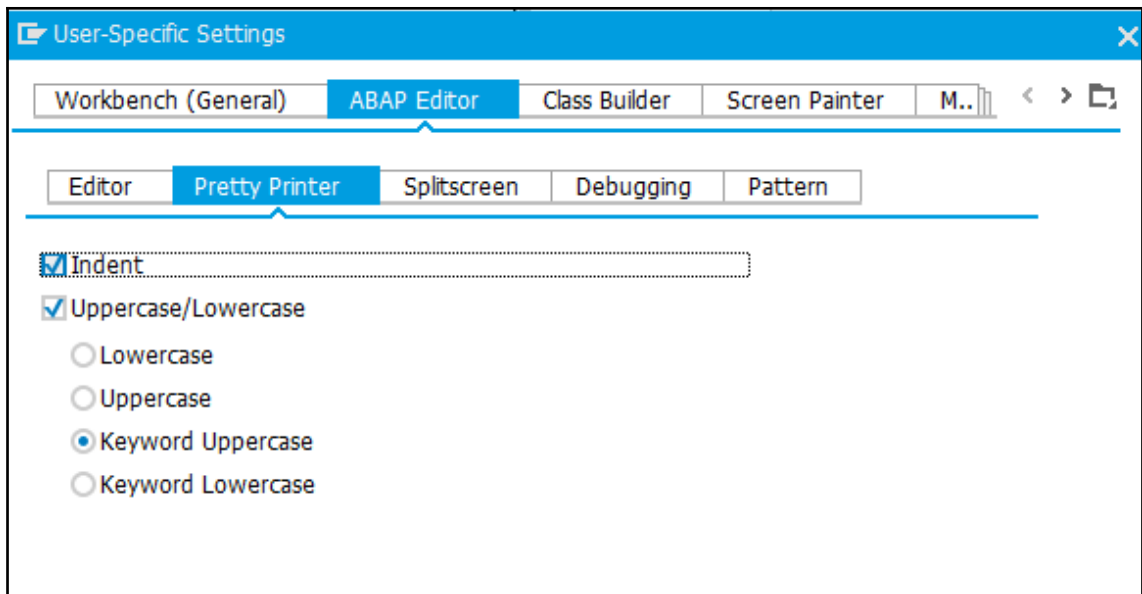
Program Edit Goto Utilities Environment System Help

ABAP Editor: Display

MIME Repository

Settings  
 Display Object List Ctrl+Shift+F5  
 Worklist  
 Display Navigation Window Ctrl+Shift+F4  
 Update Navigation Index  
 Help On... Ctrl+F8

ND\_JOB



Select aggregates

Measure runtime    Global Variables

- ABAP Objects Performance Examples
  - SQL Interface
    - Select ... Where vs. Select + Ct
    - Test Existence
    - Select aggregates
    - Select with select list
    - Column Update
  - Index and Buffer Support
  - Array Operations (internal tables)
  - Select over more than one table
  - Context
  - Internal Tables
    - Using explicit work areas
    - Linear search vs. binary search
    - Dynamic vs. static key access
    - Secondary indices
    - Key access to multiple lines
    - Sorted and Hashed Tables
    - Building unique standard tables
    - Building unique sorted/hashed tables
    - Modifying single lines
    - Using the Assigning Command
    - Building condensed tables
    - Array Operations
    - Sorting internal tables
    - Simple Algorithms
  - Typing
  - If, Case, ....
  - Field Conversion
  - Character/String Manipulation
  - ABAP Objects
    - Methods vs Subroutines
    - Methods vs Function Modules
    - Local Methods vs global Method

### Select ... Where + Check

```

          DATA: MAX_MSGNR type t100-magnr.
          MAX_MSGNR = '000'.
          SELECT * FROM T100 INTO T100_WA
            WHERE SFRSL = 'D' AND
                   ARBGB = '00'.
          CHECK: T100_WA-MSGNR > MAX_MSGNR.
                MAX_MSGNR = T100_WA-MSGNR.
          ENDSELECT.
          
```

Ln 1 - Ln 8 of 8 lines

### Select using an aggregate function

```

          DATA: MAX_MSGNR type t100-magnr.
          SELECT MAX( MSGNR ) FROM T100 INTO max_magnr
            WHERE SFRSL = 'D' AND
                   ARBGB = '00'.
          
```

Ln 1 - Ln 4 of 4 lines

### Documentation

If you want to find the maximum, minimum, sum and average value or the count of a database column, use a select list with aggregate functions instead of computing the aggregates yourself. Network load is considerably less.

# Assessments

