SAP ABAP Video Course

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Solution Architect (ABAP)

Author – “Complete ABAP” by SAP Press

Who Should Take This Course:

- ✓ Planning a career in ABAP
- ✓ Junior ABAP Consultants planning to expand their knowledge
- ✓ SAP Functional Consultants
- ✓ SAP Projects Team Members
- ✓ SAP BI Consultants
- ✓ SAP BASIS Consultants

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At the end of the course you will be able to:

- ✓ Gain complete technical understanding of an SAP System
- ✓ Gain knowledge on Basic and Advance concepts in ABAP
- ✓ Work on various development objects in ABAP
- ✓ Master debugging and troubleshooting
- ✓ Work with Enhancements
- ✓ Understand existing code
- ✓ Handle any ABAP projects

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Prerequisites:

- ✓ Absolutely Nothing

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Session Objective

- ✓ Understand ERP Software
- ✓ Comparison between different ERP Vendors
- ✓ SAP Products and Naming Convention
- ✓ Modules in SAP
- ✓ Types of Users
- ✓ ABAP vs HANA

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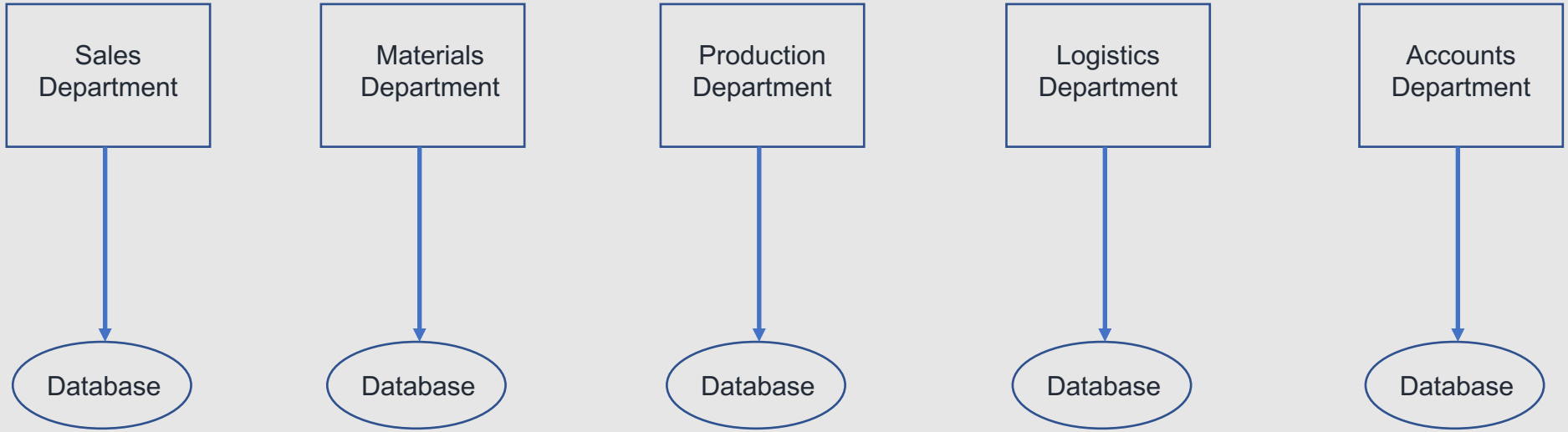
SECTION 1:Unit 1

Introduction to ERP

NON ERP



ABAP VIDEO SERIES
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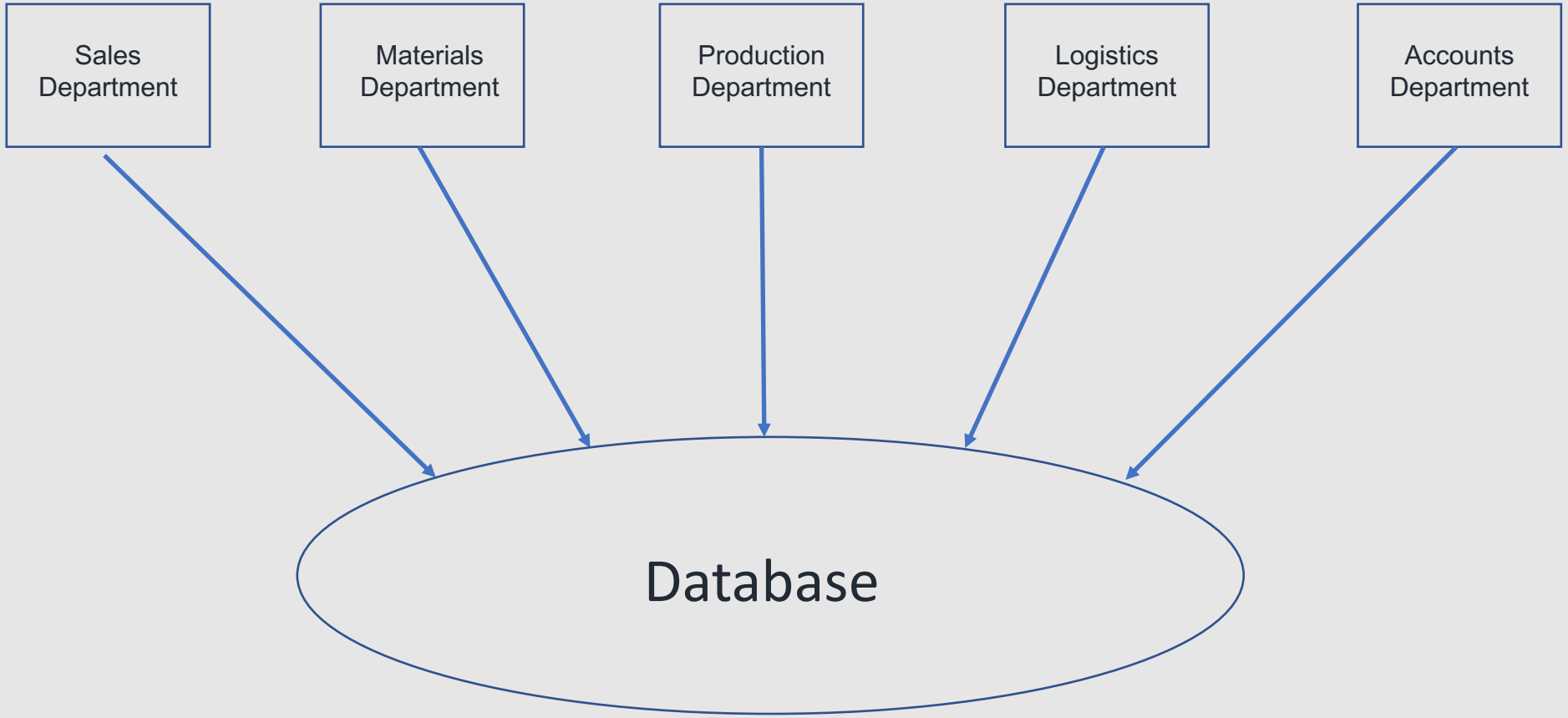
ERP



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Parameter	SAP	Oracle	Microsoft Dynamics
Market Share	20.3%	13.9%	9.4%
Average Implementation Duration	19.5 Months	23.4 Months	24.9 Months
Average Cost of Ownership	$2.2 Million	$2.7 Million	$1.7 Million
Average Payback Period	9 Months	21 Months	22 Months
Disruption at Go-Live	57%	60%	71%

*Source Internet

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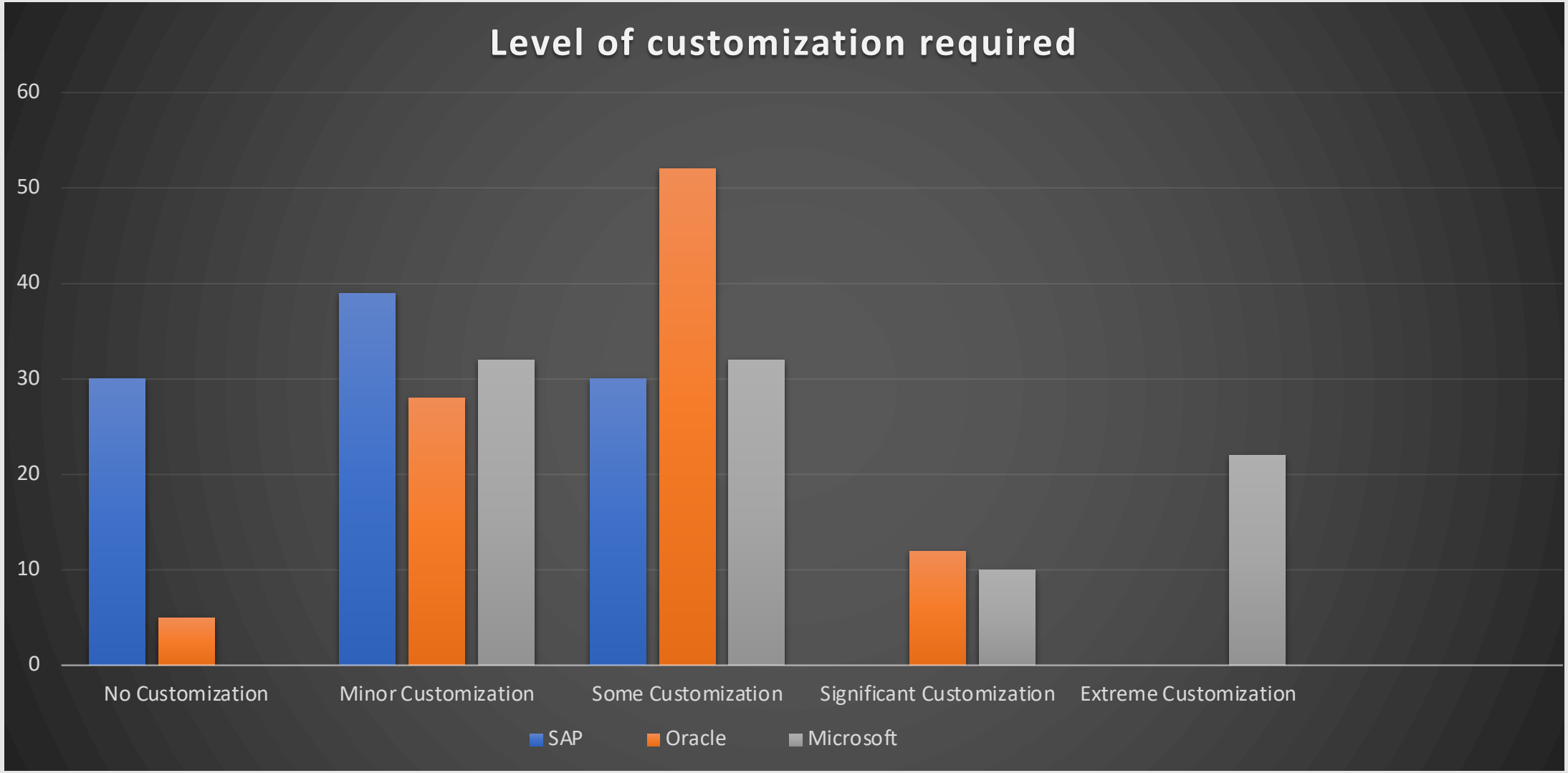

*Source Internet

SAP Products

- ✓ Enterprise Resource Planning (ERP)
- ✓ Customer Relationship Management (CRM)
- ✓ Product Lifecycle Management (PLM)
- ✓ Supply Chain Management (SCM)
- ✓ Supplier Relationship Management (SRM)
- ✓ And Many More

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SAP Product Naming

- ✓ Platform (NetWeaver 7.5 SP02)
- ✓ System (ERP 6)
- ✓ Enhancement Package (EHP 8)

Modules in SAP

- ✓ Functional Modules
- ✓ Technical Modules

Functional Modules

- ✓ FI (Finance)
- ✓ CO (Controlling)
- ✓ SD (Sales & Distribution)
- ✓ MM (Material Management)
- ✓ WM (Warehouse Management)
- ✓ HCM (Human Capital Management)
- ✓ PP (Production Planning)
- ✓ And many more

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Technical Modules

- ✓ BASIS
- ✓ ABAP
- ✓ BI/BW
- ✓ XI/PI
- ✓ HANA

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Types of users

- ✓ End Users
- ✓ Functional Consultants
- ✓ Technical Consultants

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ABAP vs HANA

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Role of an ABAP Consultant

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Customizing SAP Software

- ✓ Customer Enhancements
- ✓ Modifications
- ✓ Customer Developments

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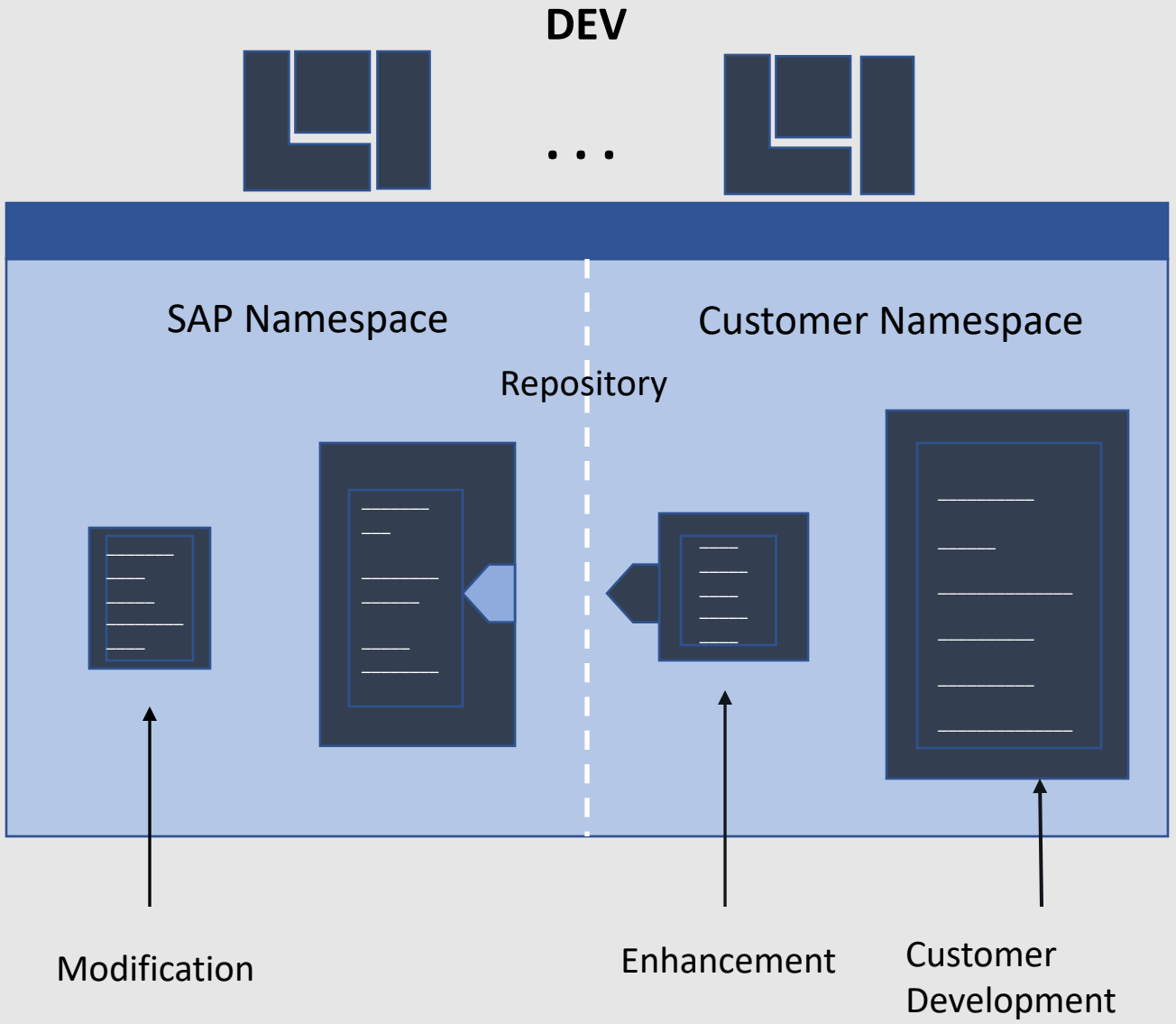
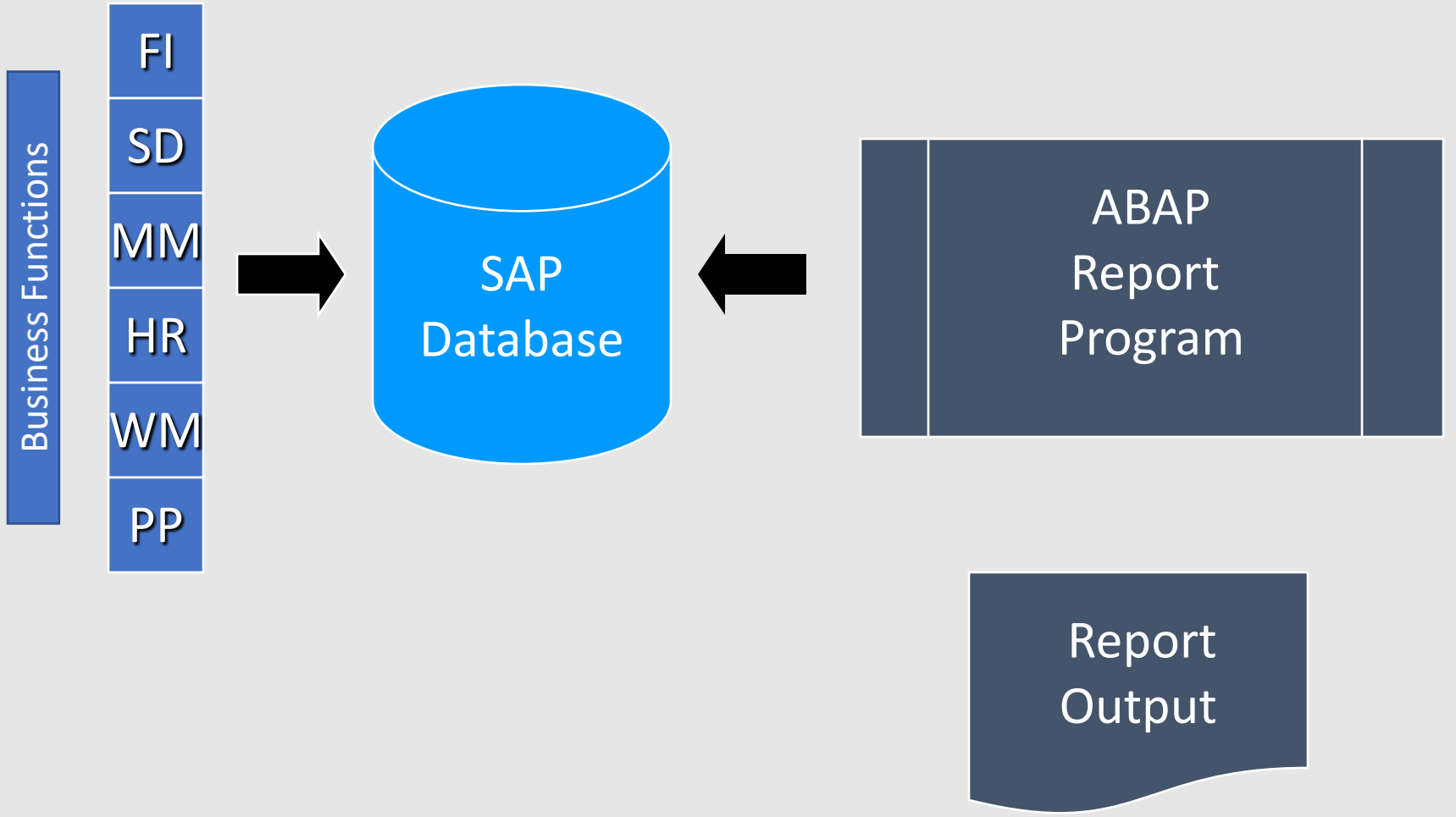


Reports



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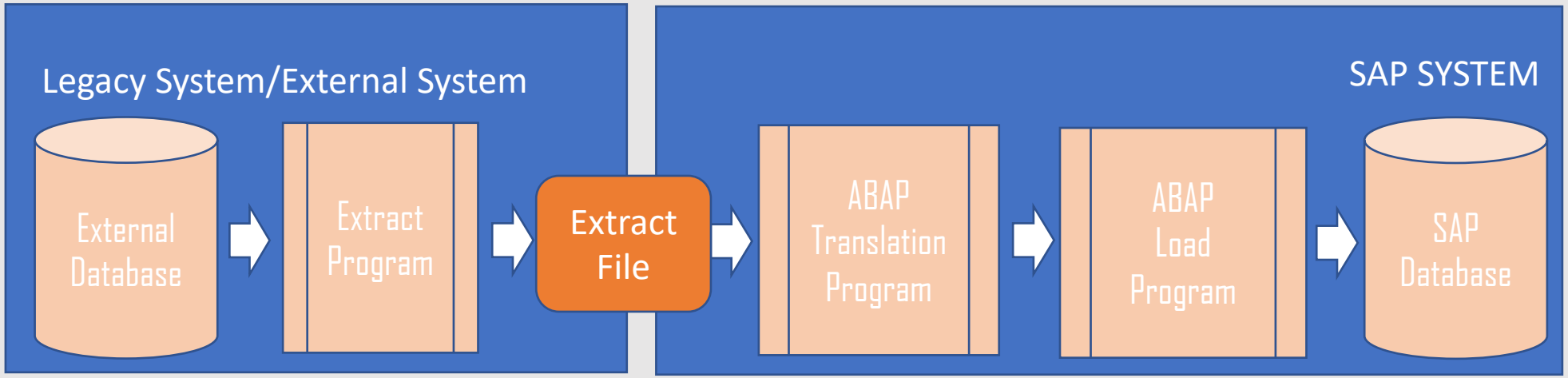
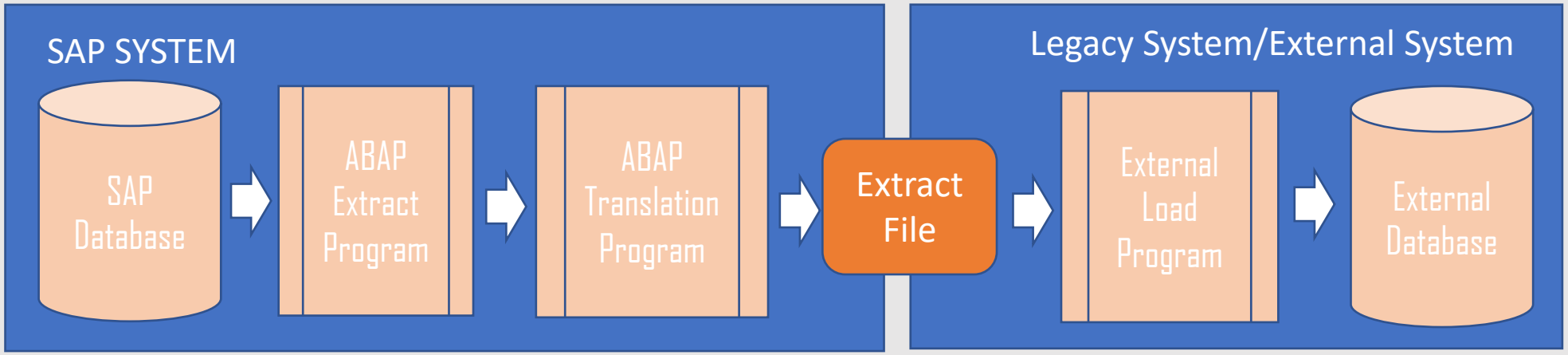
Interfaces

SAP Inbound Interface Example

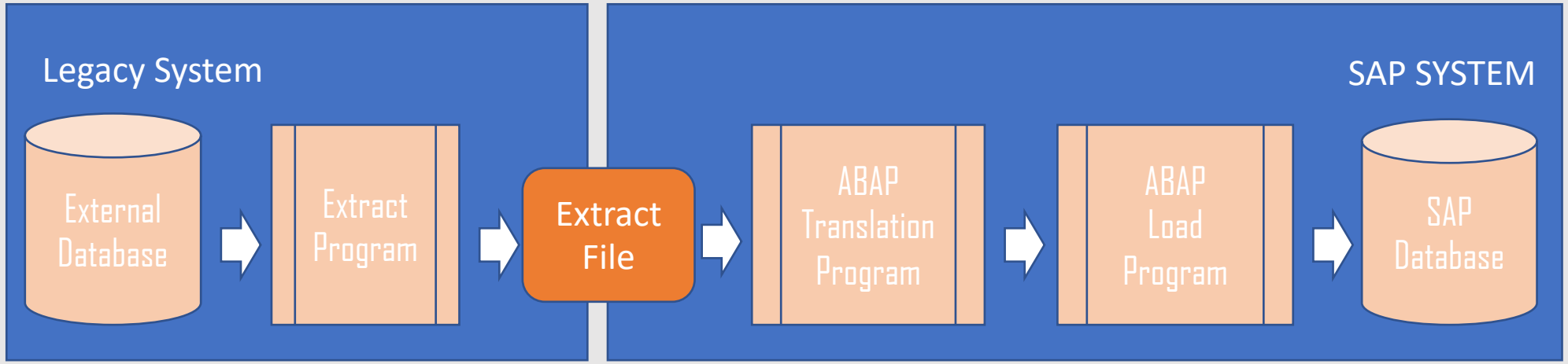


SAP Outbound Interface Example



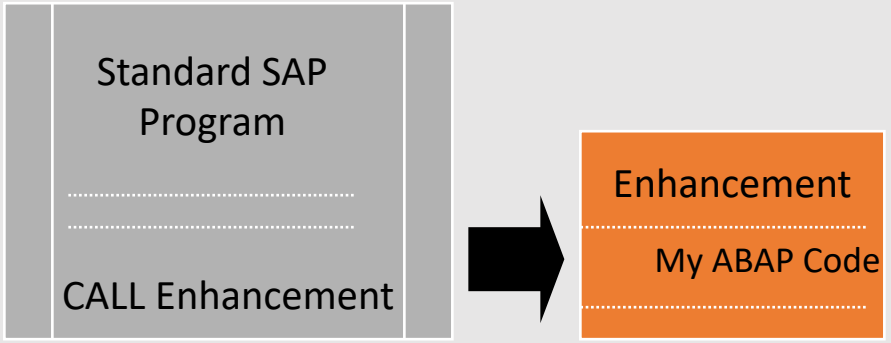
Conversion Programs

Conversion Example



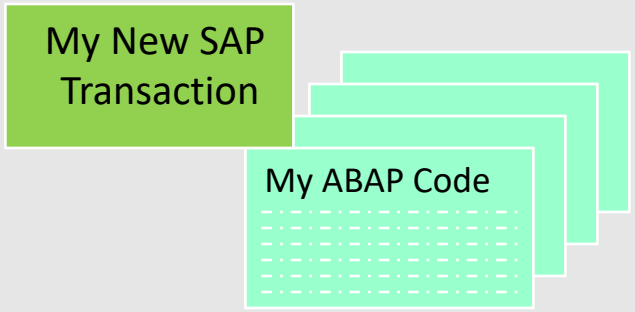
Extensions

Customizing / Enhancements



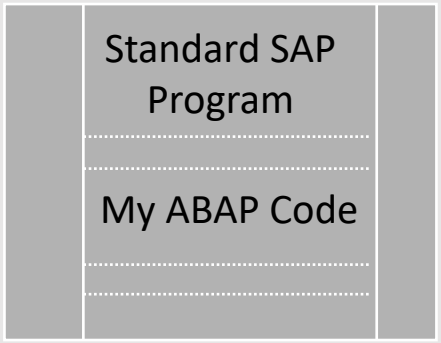
Supported by SAP

New ABAP Development



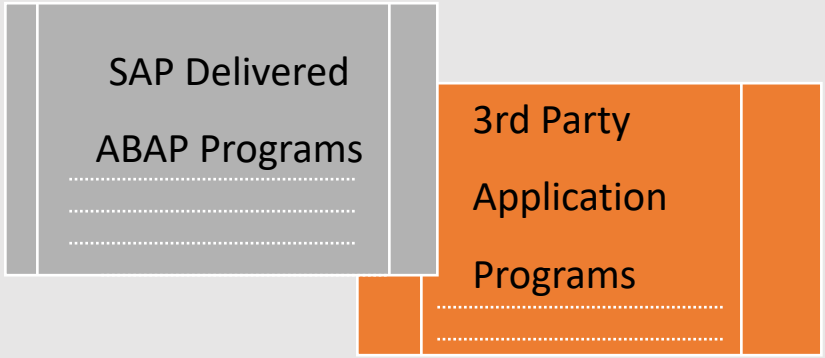
Supported by SAP

Modifications



Generally not supported by SAP

Add-on / Bolt-on



Generally supported by SAP

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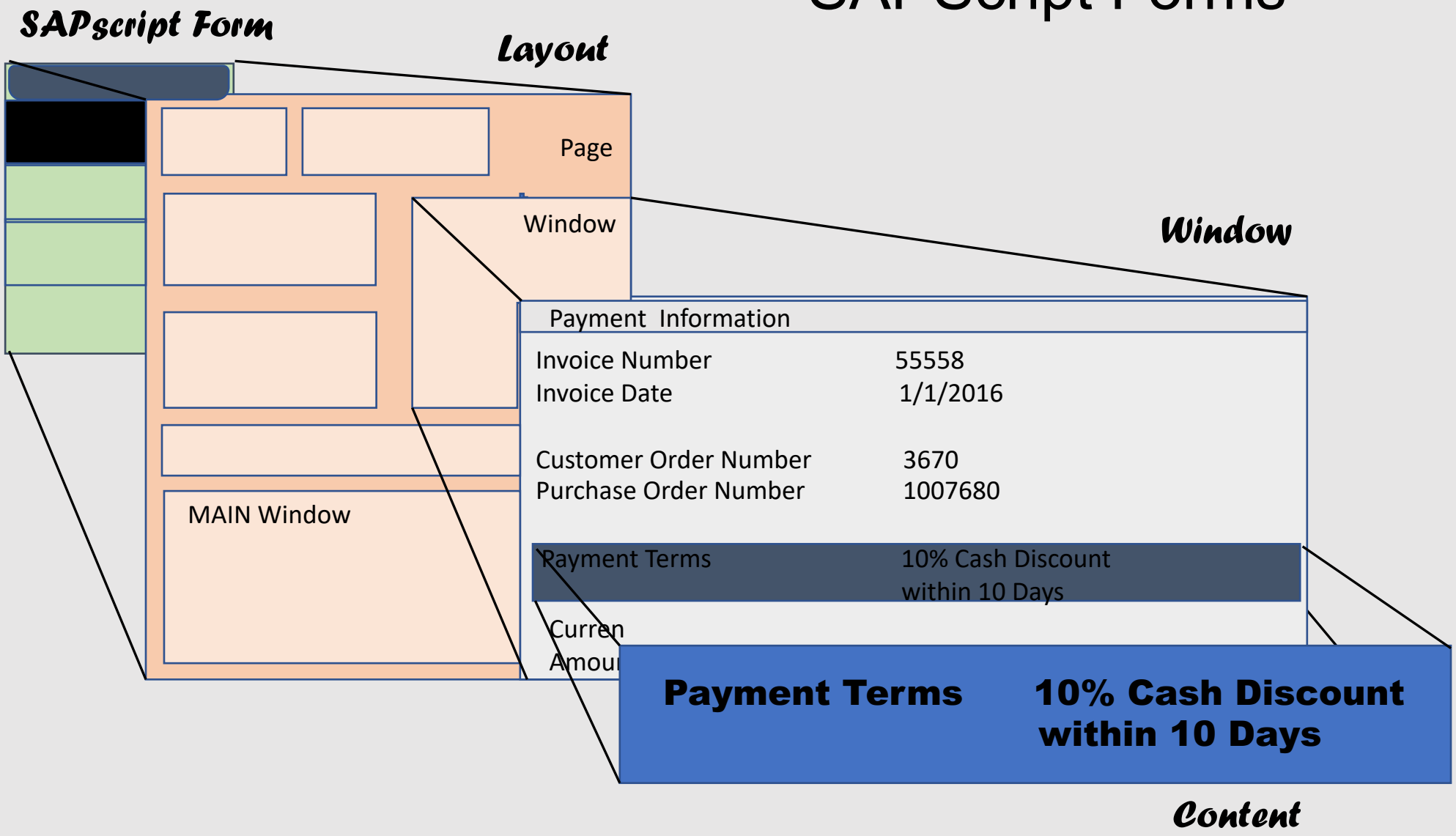
FORMS

SAPScript Forms



Architecture of an SAP System

3-tier Architecture

- Presentation Layer
- Application Layer
- Database Layer

Presentation Layer

- It is a program named SAPGUI installed on user's work station
- The Presentation interface, SAPGUI enables the user to interact with the SAP system and enter or display data
- SAPGUI accepts inputs from the user and sends these requests to the Application server for processing
- The application server sends the results back to the SAPGUI which formats the output for display.

Presentation Layer

The following types of SAP GUI are available :

- SAP GUI for the windows environment
- SAP GUI for the Java environment
- SAP GUI for HTML (Web GUI)

Application Layer

- The application layer is where an ABAP program carries out its work
- The application layer of an R/3 System is made up of the application servers and the message server
- Message server is responsible for communication between application servers
- Application server exists to interpret ABAP programs
- Programs run only in Application server and not in presentation server

Application Server

- Applications server consists of a dispatcher and multiple work processes
- The role of dispatcher is to assign a request to a work process
- The work process executes the request and becomes free and ready to take up another request

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Types of Work Process

- D (Dialog) – Dialog request
- U (Update) – Request to update data in Database
- B (Background) – Background Jobs
- S (Spool) – Print spool request
- E (Enqueue) – Logical Lock request

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Internet Communication Manager

- SAPGUI uses DIAG (Dynamic Information and Action Gateway)

- Web uses HTTP (Hypertext Transfer Protocol)

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User Context

- Memory allocated to contain the characteristics of a user logged on to ECC system
- Holds the information needed by ECC about the user like :
  - User’s current settings
  - User’s authorizations
  - Name of the program the user is currently using/running

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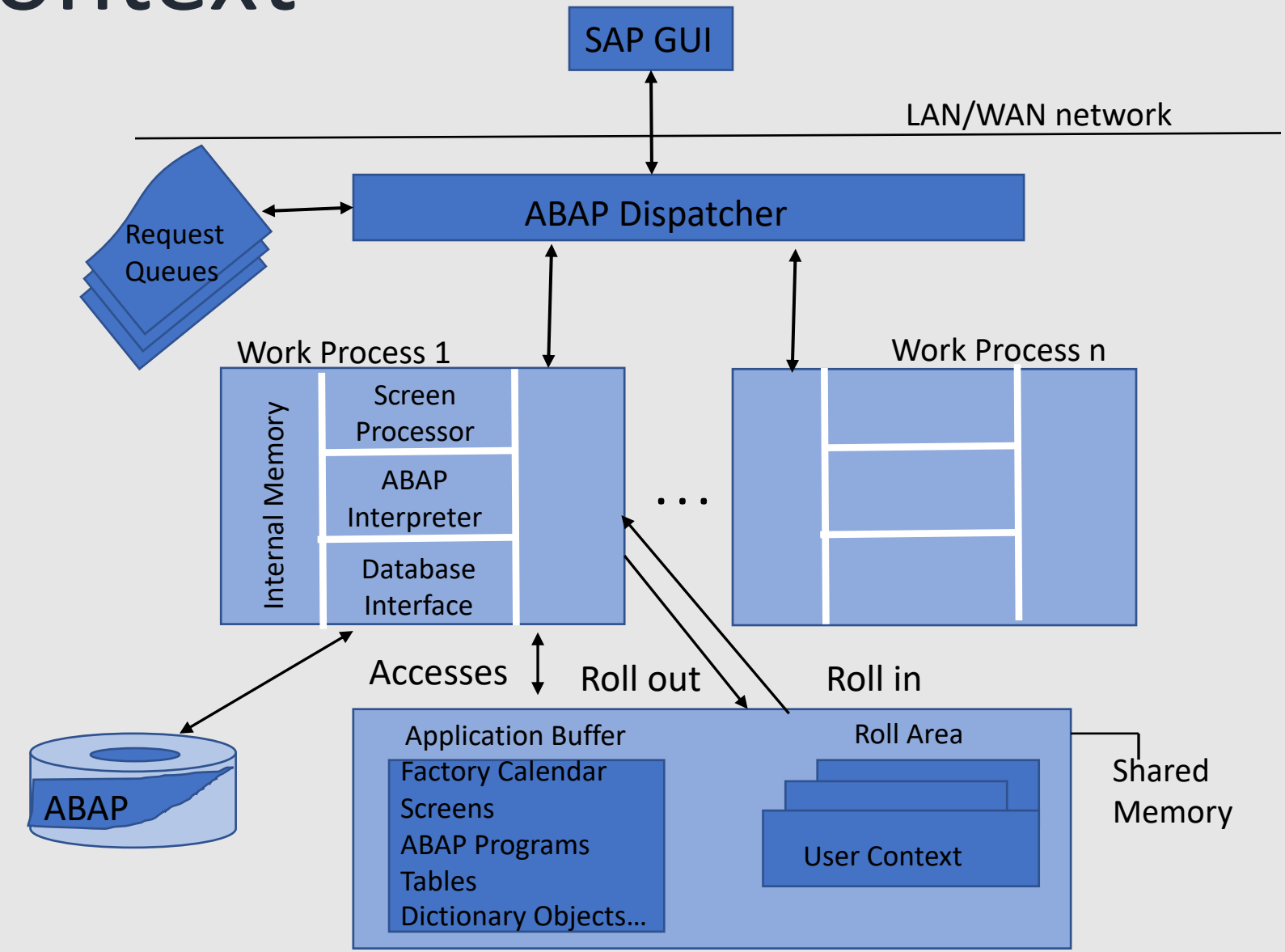
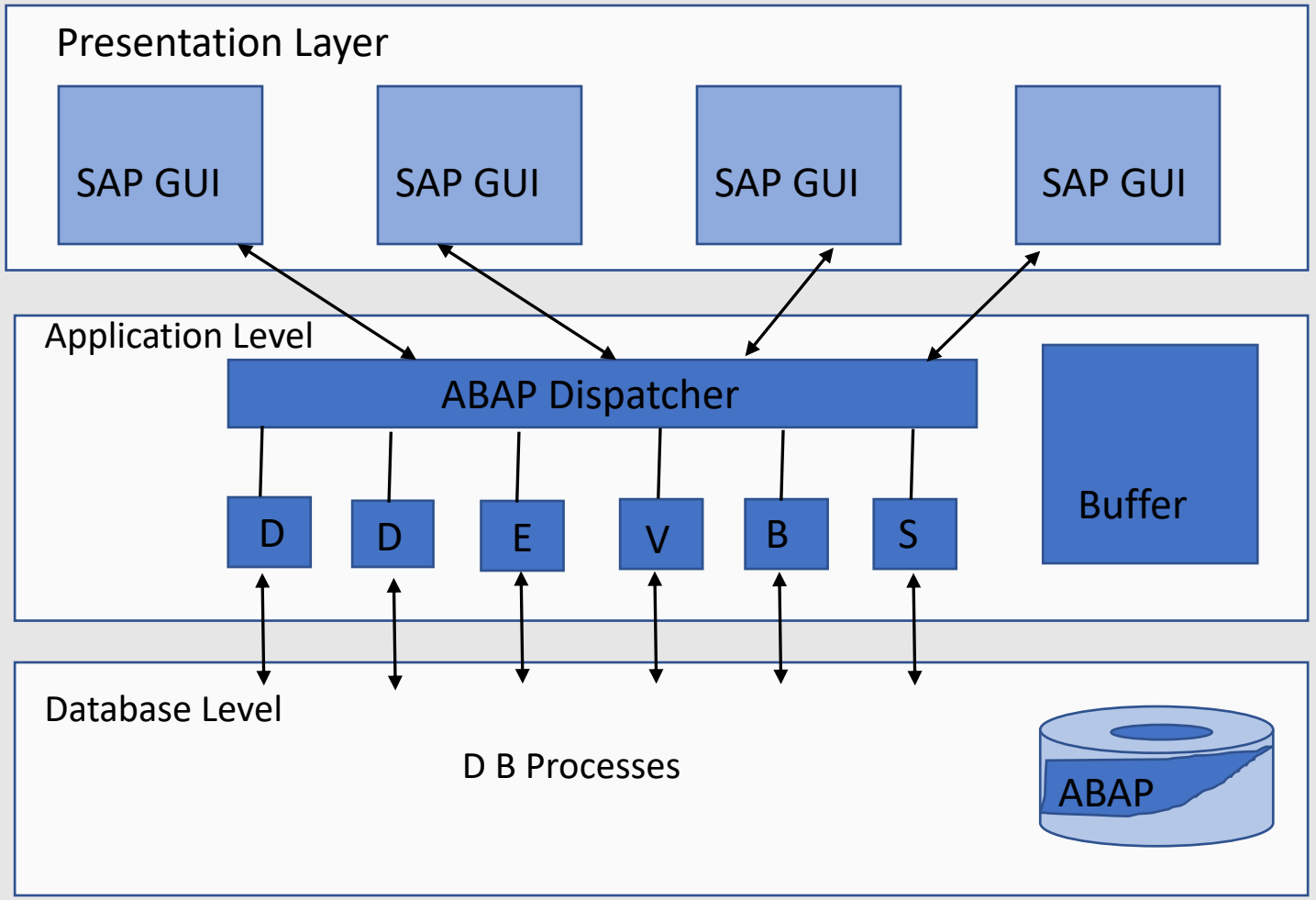
User Context





Database Layer

- Each SAP system has a central database in which the entire dataset is stored.
- Not only the application data but also all the administration data, customizing settings, ABAP source code, etc. are stored here
- The software component responsible for the database layer consists of the RDBMS and the actual database

Data Structure

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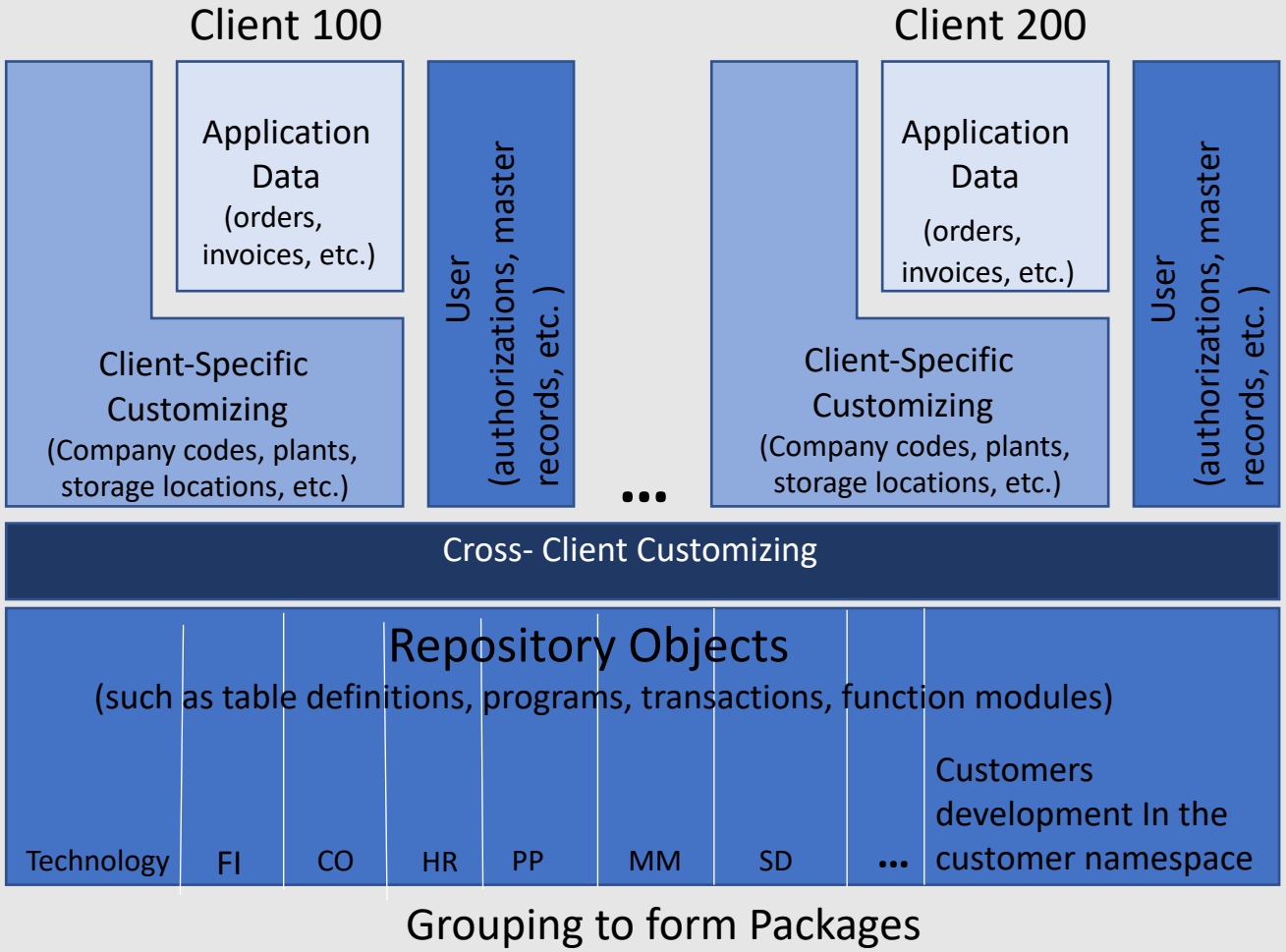
Data Structure

- What is client?
- Client specific data
- Cross Client Customization
- Repository
- Packages



Agenda

- Setting up SAP Instance
- Understanding SAP GUI Navigation
- Uunderstanding ABAP Workbench Tools

Standard Screen

- Menu Bar
- Standard Tool Bar
- Title Bar
- Application Tool bar
- Status bar

ABAP Workbench

Tools for developing and modifying SAP

- ABAP Editor (SE38) – Programming
- Data Dictionary (SE11) – Defining tables
- Screen painter (SE51) – designing the screen
- Menu Painter (SE41) – Designing the Menu
- Function Builder (SE37) – Defining Function
- Class Builder (SE24) – Defining Class
- Object Navigator (SE80) - IDE

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ABAP Syntax

- An ABAP program consists of individual ABAP statements. Each statement begins with a keyword and ends with a period.
- The first ABAP word is known as a keyword. The other words are either operands, operators (+/-) or additions to KEYWORDS
- ABAP words must be separated by at least one space
- There can be more than one statement in a program line and a statement may extend over several program lines
- ABAP code is not case sensitive

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Comment Lines

To maintain the clarity and legibility of an ABAP program, it is advisable to make this program structure transparent by using comment lines

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Program Structure

ABAP programs are always divided into two parts

- Declaration part
- Processing logic part

ABAP Type Concept

- In Principle, ABAP program statements work only with the data of the same program
- External data such as user inputs on screens or data from the database must always be transported to data local to the program in order to be processed with ABAP statements

Data Types and Data Objects

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ABAP Type Concept

- The physical units with which ABAP statements work at runtime are called internal program data objects.
- The contents of a data object occupy memory space in the program
- ABAP statements access these contents by addressing the name of the data object

ABAP Type Concept

- Each ABAP data object has a set of technical attributes, which are fully defined at all times when an ABAP program is running
- The technical attributes of a data object are: Data type, field length, and number of decimal places.
- The data type determines how the contents of a data object are interpreted by ABAP statements .

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Elementary Types

- Character (TYPE C)
- Numeric (Type N)
- Date (TYPE D)
- Time (TYPE T)
- Packed Decimal (TYPE P)
- Floating point (TYPE F)
- Integer (TYPE I)
- DecFloat (Decfloat16 and Decfloat34)
- Hexadecimal (TYPE X)
- String (TYPE STRING)
- Hexadecimal String (TYPE XSTRING)

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Elementary Types

- Character (TYPE C)
- Numeric (Type N)
- Date (TYPE D)
- Time (TYPE T)
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- Hexadecimal (TYPE X)
- String (TYPE STRING)
- Hexadecimal String (TYPE XSTRING)

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Non-Numeric Types

- Character string (C),
- Numeric character string (N),
- Date (D),
- Time (T) and
- Hexadecimal (X)

Numeric Types

- Integer (I),
- Floating-point number (F)
- Packed number (P)
- Decfloat

User Defined Types

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ABAP Program Structure

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ABAP Program Structure

- Declaration Part
- Processing Blocks
- Call
- Sequence
- Ending
- Statements

Declaration Part

- Each ABAP program consists of a global declaration part and a number of processing blocks
- The global objects are mainly data declarations that are visible in all processing blocks of the ABAP program
- In some processing blocks, local data can be declared that can then be viewed locally

Processing Block

- Processing blocks are indivisible syntax units
- A processing block cannot include another processing block
- They are called by the either by the runtime environment or by specific statements in other processing blocks
- When the first processing block is called the entire program is loaded into the memory

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Call

- This simply means how processing blocks are called
- If no processing blocks are used in the program, the whole program is considered to be under the processing block START-OF-SELECTION and is called by the runtime environment by default

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Sequence

- The order of processing blocks in the programming code is totally irrelevant to the sequence in which they are executed
- Only the code in a processing block is executed sequentially
- When the execution of a processing block is finished, control is returned to its caller

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Ending

- The execution of processing block can be ended in one of two ways
- It can either end when the last statement of the processing block has been executed or by using CHECK or EXIT statements
- On each termination, control is returned to the caller of the processing block
- However it should be noted that within loops, CHECK and EXIT affect only the current loop processing
- In latest version there is a statement RETURN which will always quit the processing block independent of the context

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Statements

- All valid statements of an ABAP program that are not part of global data declarations belong definitely to a processing block
- To understand ABAP program, its is important to identify the various processing blocks and to know at what point they will be executed.

Processing Blocks

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Processing Blocks

We shall discuss :

- All the processing blocks that are possible in ABAP programs
- The statements that define the processing blocks, how they are called, whether they can keep local data, and ABAP programs in which they can be defined

Types of Processing Blocks

There are three types of processing blocks, which differ from each other in terms of their specific characteristics

- Event blocks
- Dialog Modules
- Procedures

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Event Blocks

- Event blocks are introduced by event keywords
- They are ended implicitly by next processing block or the end of the program as opposed to specifically by their own keyword
- Event blocks have no local data area
- A data declaration in an event block is added to the global data
- The execution of an event block is triggered by events in the ABAP runtime environment

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Event Blocks

- If an appropriate event block is implemented in the ABAP program for an event of the runtime environment, the event block is executed. Otherwise the event has no effect
- Conversely, event blocks will not be executed in an ABAP program unless the associated event takes place while the program is being executed

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Types of Events

- Program constructor event
- Reporting events
- Selection screen events
- List events
- Screen events

Dialog Modules

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Dialog Modules

- Dialog modules are implemented in executable programs, module pools, or function groups between

  MODULE

  …..

  ENDMODULE

- Like event blocks, dialog modules have no local data area and no parameter interface.
- A data declaration in a dialog module is also added to the global data
- Dialog modules are called from the screen flow logic with MODULE statement

Procedures

Procedures

- Procedures have a local data area and can have a parameter interface
- They can be called internally from within the same program or externally from other ABAP program
- Procedures provide reusable software blocks

Types of Procedures

- Subroutines
- Function Modules
- Methods

Subroutines

- Subroutines can be implemented between the statements

FORM

.....

ENDFORM.

- They are called by the user using the PERFORM statement

Function Modules

- Function modules are defined in function pool type ABAP programs between the statements

  FUNCTION

  .....

  ENDFUNCTION.

- They are called with the CALL FUNCTION statement and the user fills the interface with keyword parameters and therefore must know there names.

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Methods

- Methods are part of the procedures since ABAP objects was first introduced
- They are defined in the implementation part of classes between the

  METHOD

  ….

  ENDMETHOD statements
- They are called using CALL METHOD statement.

Events

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Types of Events

- Program constructor event
- Reporting events
- Selection screen events
- List events
- Screen events

Program Constructor Event

LOAD-OF-PROGRAM

- This event is triggered just once during the execution of the program; when the ABAP program is loaded into the memory
- This applies to all program types except class pools
- The statements in this block allow you to initialize the data of the program

Reporting Events

- INITIALIZATION
- START-OF-SELECTION
- GET table
- GET table LATE
- END-OF-SELECTION

The corresponding event is triggered only when an executable program is running

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Reporting Events

- INITIALIZATION : This event is used to initialize the data
- START-OF-SELECTION : This event plays a leading role as the standard event.

This means that all statements that have not been specifically assigned to another event block are automatically inserted at the beginning of this event block and executed with it

- END-OF-SELECTION : This event is used when logical databases are used in the program or to mark the end of data processing. This is the last of the events to be triggered

Selection Screen Events

- AT SELECTION-SCREEN
- The corresponding events are triggered by the runtime environment when a selection screen is processed in executable programs, module pools, or function groups
- Selection screens can be prepared and user actions evaluated in the event blocks

List Events

- TOP-OF-PAGE
- END-OF-PAGE
- AT LINE-SELECTION
- AT USER-COMMAND
- The corresponding events are triggered by the runtime environment in executable programs, module pool programs, or function groups while a classical list is being generated or if the user performs an action on the displayed list

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Screen Events

- PROCESS BEFORE OUTPUT (PBO)
- PROCESS AFTER INPUT (PAI)
- PROCESS ON HELP REQUEST (POH)
- PROCESS ON VALUE REQUEST (POV)
- These event blocks are defined in the screen flow logic as opposed to the ABAP program
- The screen flow logic controls the processing of the screens in SAP systems

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