SAP R/3 HR Programming Overview
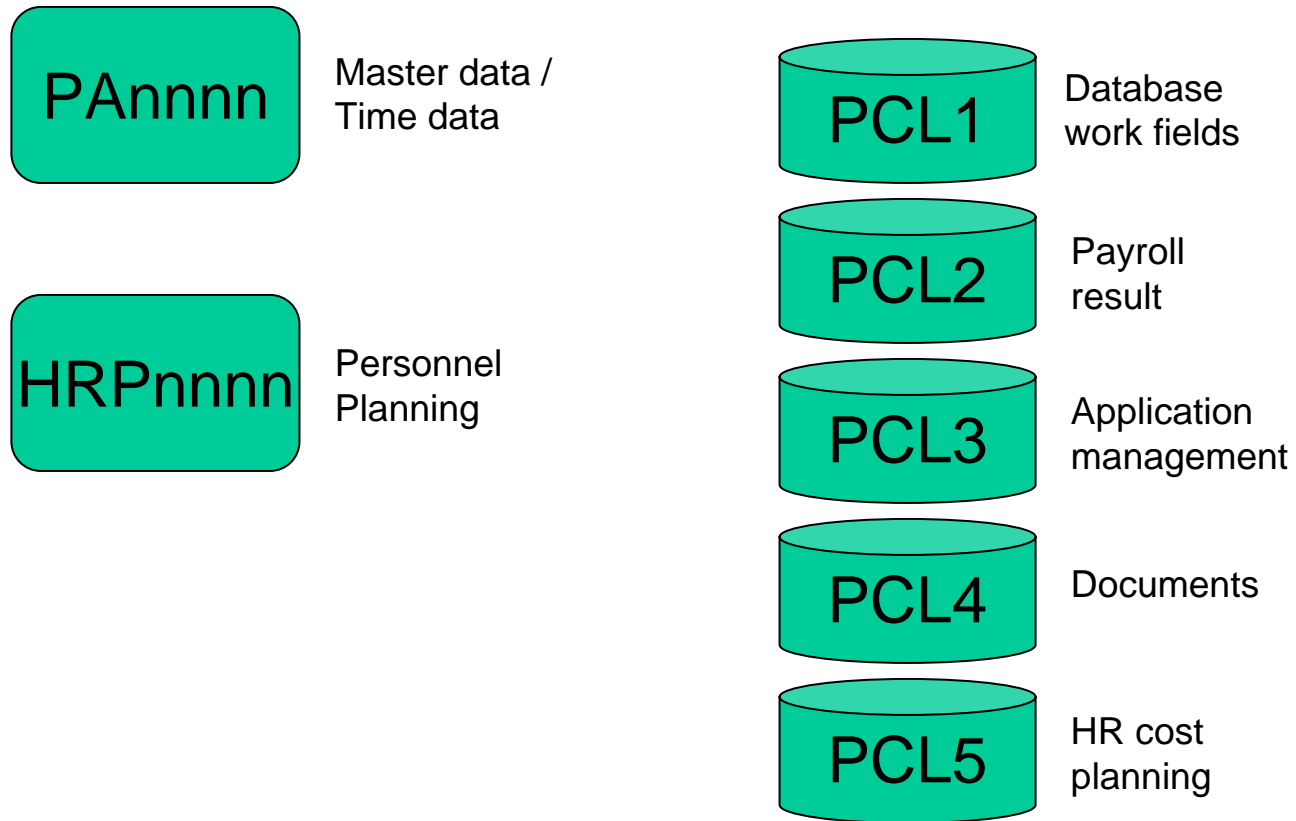
Prepared by

Mohd Misnan

mmisnan@melayu.plus.com

03/12/2004

HR Data Structure

PAnnnn — Master data / Time data

HRPnnnn — Personnel Planning

PCL1 — Database work fields

PCL2 — Payroll result

PCL3 — Application management

PCL4 — Documents

PCL5 — HR cost planning

Transparent Tables

Data Clusters

Master Data (PA)

- Infotypes :
  - Business definition: grouping of fields with related contents based on business requirement.
  - Technical definition: grouping of attributes (basically, a screen with underlying transparent table) .
  - E.g. : IT0002, personnel details infotype which contains person unique characteristics like Forename, Surname, Title, Date of Birth, also specific to the country like NI number etc.

Master Data (PA)

Example of IT0002 - personnel details infotype (Transaction **PA30**)

Master Data (PA)

- Infotypes number ranges

Number range	Reserved for
0000-0999	HR Master Data
1000-1999	Organisational management/personnel planning
2000-2999	Time management
4000-4999	Recruitment
9000-9999	Customer-developed enhancements

- List of infotypes is available in table V_T582A.

- Infotype can be subdivided into subtype which also controls the actions of the infotype. E.g. Family/Related Person (IT0021).

- Infotype can be subdivided further by object identification. E.g. Family/Related Person (IT0021), subtype Child.

Master Data (PA)

- Time and time constraints in infotypes
  - validity start (BEGDA) and end date (ENDDA) of a record
  - time constraint class 1
    - information that must exist. E.g. the name of an employee. Creation of new record will automatically delimits the previous data record.
  - time constraint class 2
    - information that can exist at any time but not required. It may occur only once. E.g. spouse information in IT0021.
  - time constraint class 3
    - information that can occur as often as necessary. E.g. child information.

Master Data (PA)

Example of IT0021 for time constraints

Master Data (PA)

- Technical data structure of Infotypes
  - structure PAKEY, contains the primary key of an infotype.
    - PERNR - Personnel number
    - SUBTY - Subtype
    - OBJPS - Object identifier
    - SPRPS - Lock & release record
    - ENDDA - End date of the validity period
    - BEGDA - Start date of the validity period
  - structure PSHD1
    - other basic information for each infotype
- Records of infotype nnnn are stored in the transparent table PAnnnn.

Payroll Result Data (PCL2)
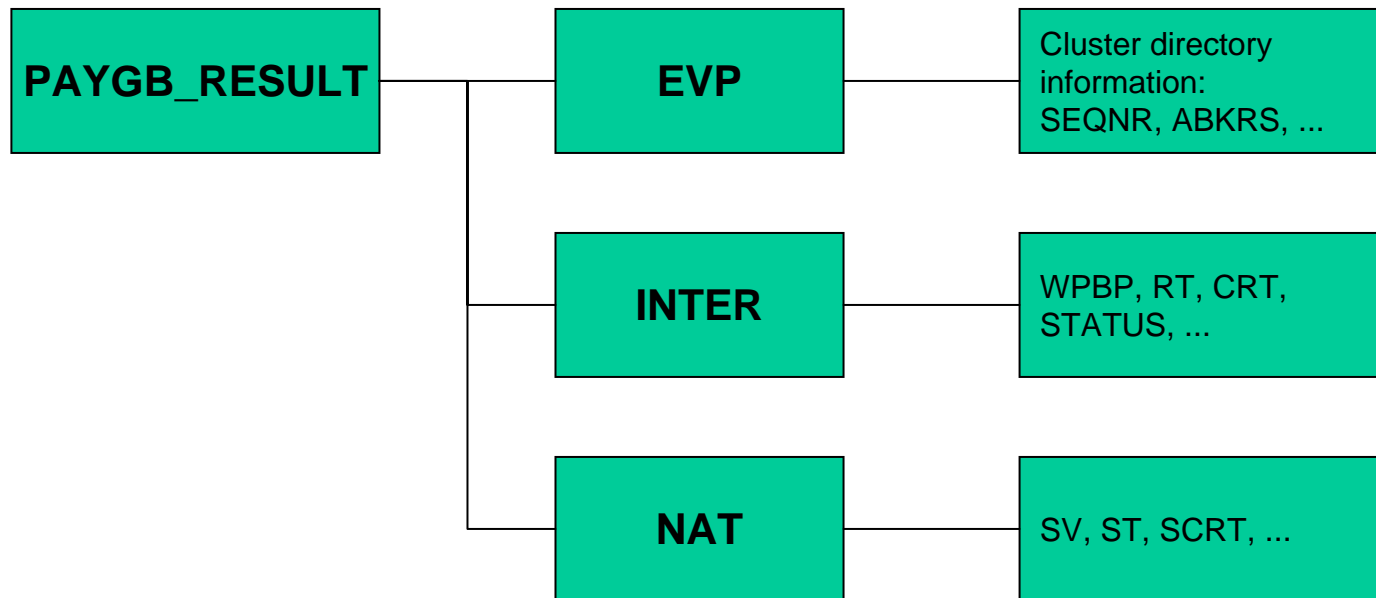
- Stored in the transparent table PCL2.
- Example of some clusters available in PCL2:
  - CU   - Cluster directory
  - RG   - Payroll results (GB)
  - B2   - Time management results
  - ZL   - Personal shift plan
  - PS   - Generated schema
  - PT   - Texts for generated schema
- Data is stored in CLUSTD field.

Payroll Result Data (PCL2)

- Cluster Directory
  - Payroll directory is created for every employee.
  - Specific payroll results from an individual payroll period can only be accessed later via this cluster directory.
  - Structure of cluster directory:
    - SEQNR - contains a sequence number
    - ABKRS - contains the payroll group in which the employee's wages are calculated.
    - FPPER - for period of the payroll run
    - FPBEG & FPEND - start and end date of the payroll period.
    - IABKRS, IPERM, INPER, IPEND - contain the in period information.
  - To optimise data selection, RGDIR table of cluster CU is replicated into HRPY_RGDIR.

Payroll Result Data (PCL2)

- Deep data structure for reporting. PAYGB_RESULT.

```
┌──────────────────┐      ┌──────────────┐      ┌──────────────────────┐
│  PAYGB_RESULT    │──────│     EVP      │──────│ Cluster directory    │
│                  │   │  │              │      │ information:         │
└──────────────────┘   │  └──────────────┘      │ SEQNR, ABKRS, ...    │
                       │                        └──────────────────────┘
                       │  ┌──────────────┐      ┌──────────────────────┐
                       │──│    INTER     │──────│ WPBP, RT, CRT,       │
                       │  │              │      │ STATUS, ...          │
                       │  └──────────────┘      └──────────────────────┘
                       │  ┌──────────────┐      ┌──────────────────────┐
                       └──│     NAT      │──────│ SV, ST, SCRT, ...    │
                          │              │      │                      │
                          └──────────────┘      └──────────────────────┘
```

Payroll Result Data

Use transaction **PC_PAYRESULT** to display payroll result

HR Programming - Logical Database

- Why use LDB in HR Programming?
  - To reduce programming efforts - events driven, selection screen and data extraction provided by LDB.
  - Centralised authorisation checking.
  - Improved performance.
- LDB for master data and payroll reporting
  - Master data (PA) reporting - PNP
  - Payroll reporting - PNP / selection screen: 900
- Report categories
  - Determines which function keys are available, which selection parameters appear and the properties of the selection parameters.

HR Programming - Logical Database

HR Programming - Logical Database

- INFOTYPES statement
  - Creates internal tables which are populated at the GET PERNR event. E.g:

| INFOTYPES: 0002. | → | DATA BEGIN OF p0002 OCCURS 10.

INCLUDE STRUCTURE p0002.

DATA END OF p0002 VALID BETWEEN begda AND endda. |
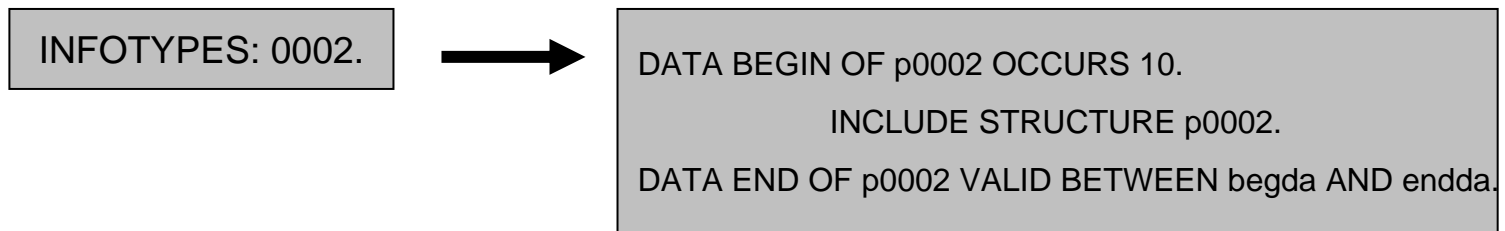
- GET PERNR.
  - Populates PERNR structure and all infotypes declared in the INFOTYPES statement.
  - Infotypes declared with MODE N will not be populated during this event.

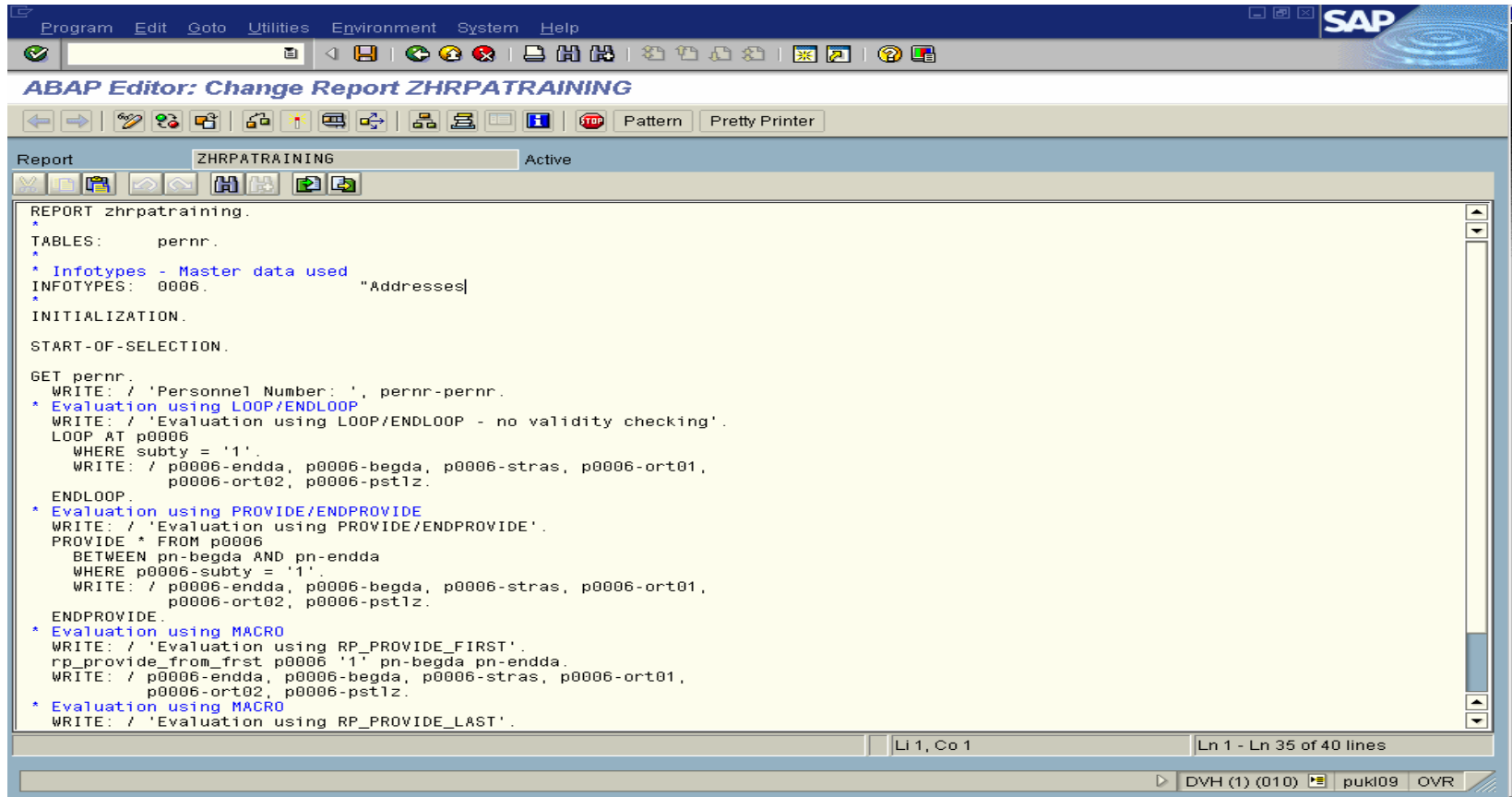# HR Programming - Logical Database

- PROVIDE .. ENDPROVIDE.
    - Evaluates the infotype records which validity interval intersects with the interval given in the data selection period.

```
PROVIDE * FROM P0006
          BETWEEN PN-BEGDA AND PN-ENDDA
          WHERE P0006-SUBTY = '1'.
* additional processing
ENDPROVIDE.
```

HR Programming - Logical Database

- PNP LDB - important variables to remember:
  - PN-BEGDA / PN-ENDDA - end/start of DATA selection period.
  - PN-BEGPS / PN-ENDPS - end/start of PERSON selection period and used to determine the selection of personnel numbers to be processed.
  - Table PERNR needs to be declared.
  - After GET PERNR event, structure PERNR contains the most important information (IT0000 and IT0001).
  - Example program available in Development client 010/020 = ZHRPATRAINING.

HR Programming - Logical Database

HR Programming - LDB - PY

- Using LDB for HR-PY programming:
  - Available from SAP R/3 4.6c and above.
  - Screen 900 is assigned as the selection-screen at the program attribute.
  - PYORGSCREEN and PYTIMESCREEN need to be declared in TABLES statement for the extra payroll related selection-screen.
  - PAYROLL node to be declared in the NODE statement with reference type to PAYGB_RESULT for UK or PAY99_RESULT for international.
  - HR report category can be changed to use Payroll Results (Cluster) for selection screen customisation.

HR Programming - LDB - PY

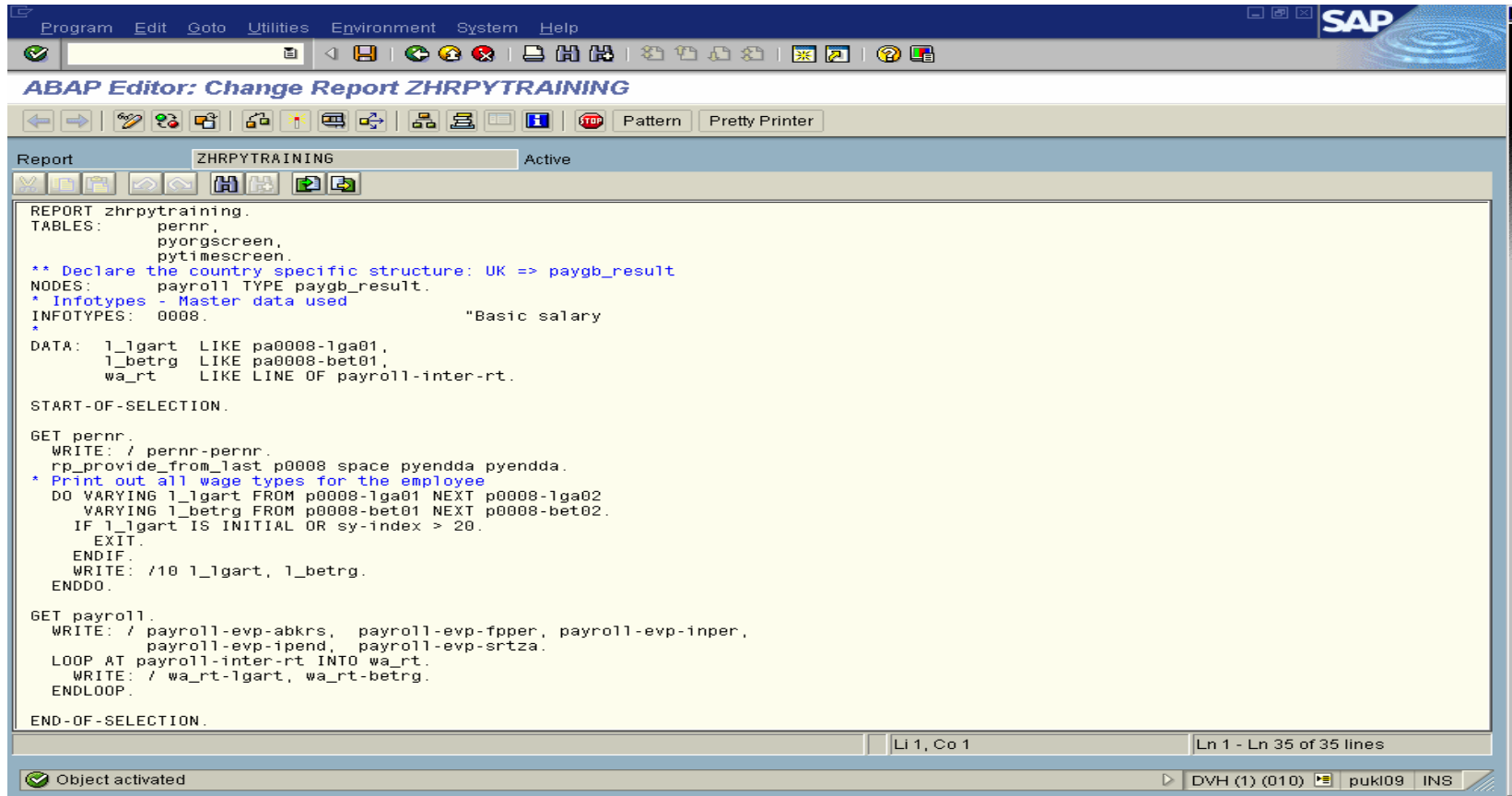# HR Programming - LDB - PY

- GET PAYROLL.
  - PAYROLL structure will be populated. If more than one payroll period is specified at the selection screen, this event will be executed for each period.
  - Payroll results internal table may contains more than one result depending on the 'status of result' selection.
  - To evaluate payroll result, LOOP through the PAYROLL-INTER-RT internal table.

HR Programming - LDB - PY

- Things to remember when doing HR-PY programming:
  - PYBEGDA / PYENDDA - end/start of PAYROLL DATA selection period.
  - Data evaluation will be based on HRPY_RGDIR (Payroll directory information) rather than from HR-PA master data.
  - Example program available in Development client 010/020 - ZHRPYTRAINING.

HR Programming - LDB - PY

HR Programming - Using macros

- Macros are widely used in HR programming.
- Methods:
  - Using RMAC macros declared in TRMAC table (older method)
  - Using macros in the include program DBPNPCOM (for PNP LDB - newer method)
- Some important macros:
  - RP-LOWDATE-HIGHDATE (TRMAC)
    - defines the constants LOW-DATE (01/01/1800) and HIGH-DATE (31/12/9999)
  - RP-SEL-EIN-AUS-INIT (TRMAC)
    - exclude employee with employment status NE 0.

HR Programming - Using macros

- Some important macros:
  - RP_PROVIDE_FROM_FRST (PNP)
    - reads the first record of an internal table in the specified selection period. The infotype table must be sorted in ascending order.

    Example:
    rp_provide_from_frst p0002 SPACE pn-begda pn-endda.

  - RP_PROVIDE_FROM_LAST (PNP)
    - reads the last valid record of an internal table in the specified selection period.

    Example:
    rp_provide_from_last p0002 SPACE pn-begda pn-endda.

HR Programming w/o LDB

- All master data infotypes are available with a PA prefix. E.g. IT0000 is directly assessable from transparent table PA0000.

- If authorisation checks are important, SAP provides two other methods of accessing the infotypes:

  - Using function module 'HR_READ_INFOTYPES'
  - Using macro 'RP_READ_INFOTYPE' (include DBPNPCOM in the program)

HR Programming w/o LDB

- Payroll results can be extracted using the following methods:
  - If there is a need to do processing at individual steps:
    - Read cluster directory using 'CU_READ_RGDIR'
    - Read valid period from cluster directory using 'CU_READ_LAST'
    - Read payroll results using 'PYXX_READ_PAYROLL_RESULT' using SEQNO returned by 'CU_READ_LAST'.
  - Otherwise:
    - Using function module 'PYXX_GET_EVALUATION_PERIODS' or
    - Using function module 'HR_GET_PAYROLL_RESULTS' to import current payroll results.
  - Examples:
    - RPMUST01 - Model report for monthly payroll results
    - RPMUST02 - Model report for monthly payroll results - more than one period.