

## TOPIC 1: INTRODUCTION TO THE SAM II HR DATA WAREHOUSE

The purpose of this topic is to describe SAM II HR Data Warehouse and its infrastructure, including the types of tables and fields contained in the Data Model.

The objectives of this course are to describe the components of the HR Data Warehouse including the Data Model. This course will also present a reporting methodology outlining what type of information is contained in the Data Model and how to select the appropriate tables for creating Ad Hoc reports.

### At the end of this topic, you will be able to:

- Describe the purpose of the SAM II HR Data Warehouse
- Outline the Infrastructure of the HR Data Warehouse
- Describe the Main Table and Field types
- Understand the availability timeframe for PMS and MESH
- Describe the concept of effective dating and how it impacts the HR Data Warehouse



# SAM II HR DATA WAREHOUSE OBJECTIVES AND USES

## SAM II Data Warehouse

LoadedDate BGT FIN  
02/14/2000 02/14/2000

SAM II Home Site Map Personal Report Administrator Email Us Help Logout



State Applications

- Budget
- Finances
- HR/Payroll

HR/Payroll Areas of Analysis [Page Help](#)

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[Employee History](#)

Agency Detail

- [Benefits](#)
- [Deductions](#)
- [Employee](#)
- [Leave](#)
- [Payroll](#)
- [Position](#)
- [Position History](#)

Summary

- [Benefits](#)
- [Deductions](#)
- [Demographics](#)
- [Employee](#)
- [Leave](#)
- [Payroll](#)
- [Position](#)





## SAM II HR DATA WAREHOUSE OBJECTIVES AND USES

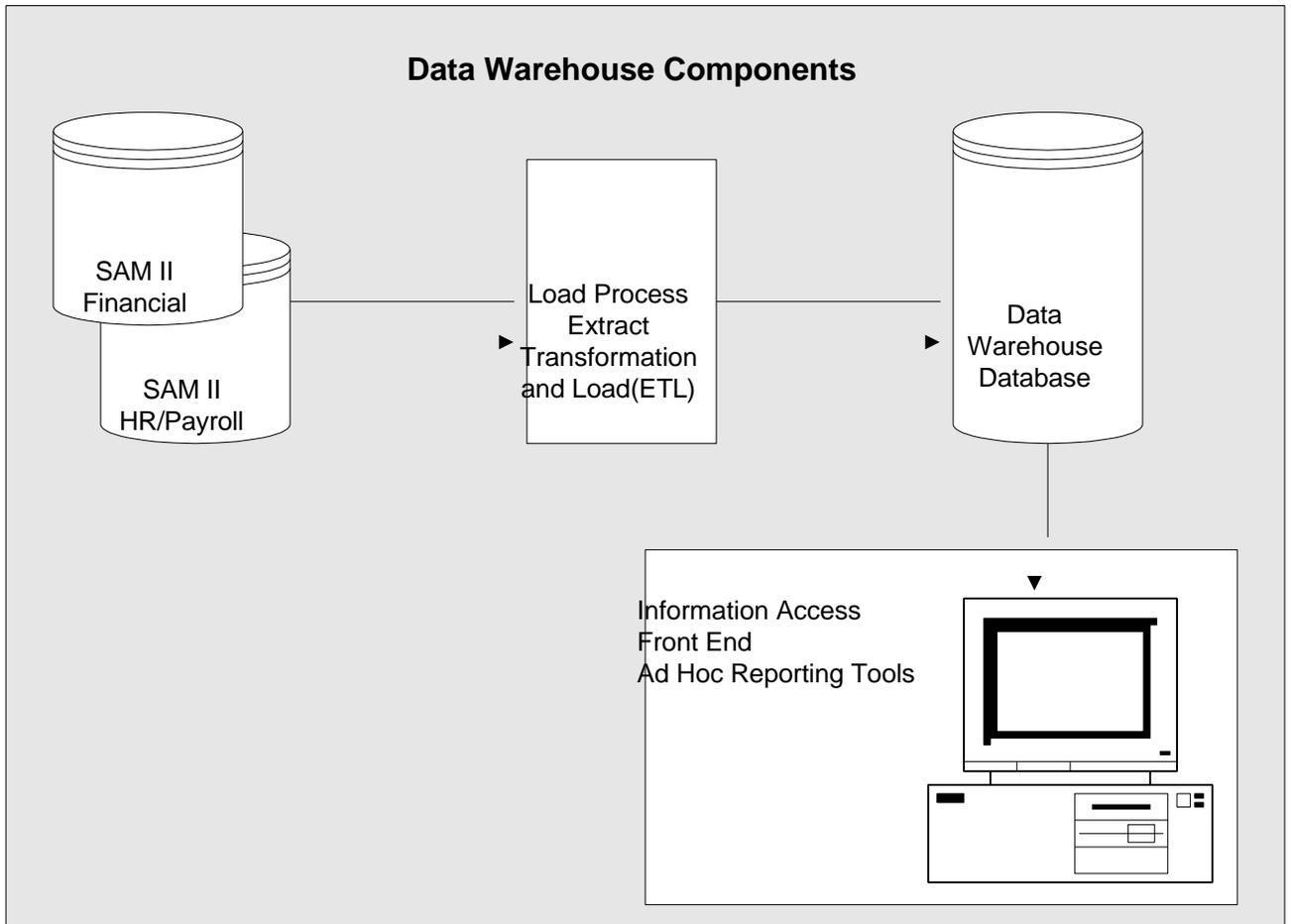
The SAM II system will incorporate a data warehouse component called the SAM II HR Data Warehouse. The SAM II HR Data Warehouse is a centralized source of data. It will provide the selected OA and agency staff with a tool for the analysis of SAM II position, employee, and payroll information at both a detailed and summary level.

**Detail Information is employee specific.** Information in the agency detail area is by individual agency and is employee specific.

**Summary level information is available across agencies (statewide) but does not include any employee specific information.** Access is determined by area, by the agency.



# SAM II HR DATA WAREHOUSE OBJECTIVES AND USES





## **SAM II HR DATA WAREHOUSE OBJECTIVES AND USES**

The overall objective of the SAM II HR Data Warehouse is to define and provide necessary information, to those who need it, in the most expeditious manner possible.

There are two information access components, They are:

### **Data Warehouse Front-End (Web Interface)**

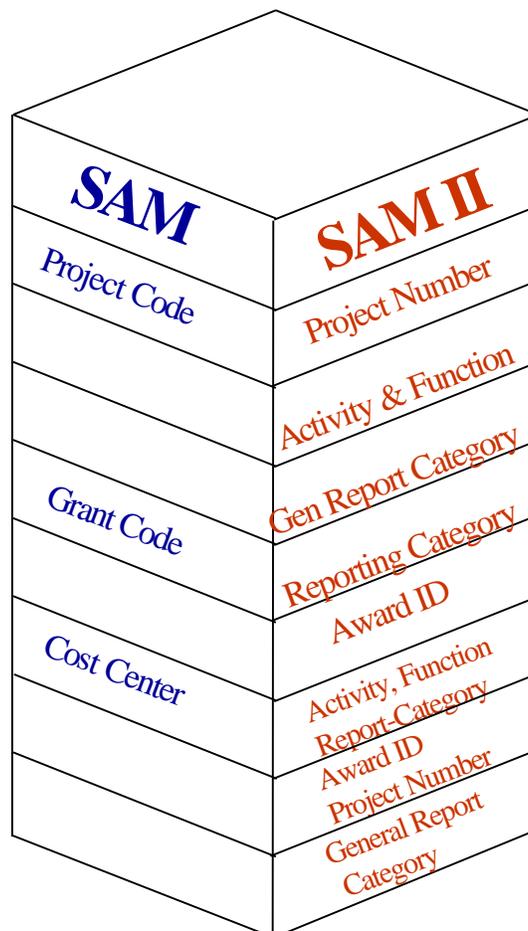
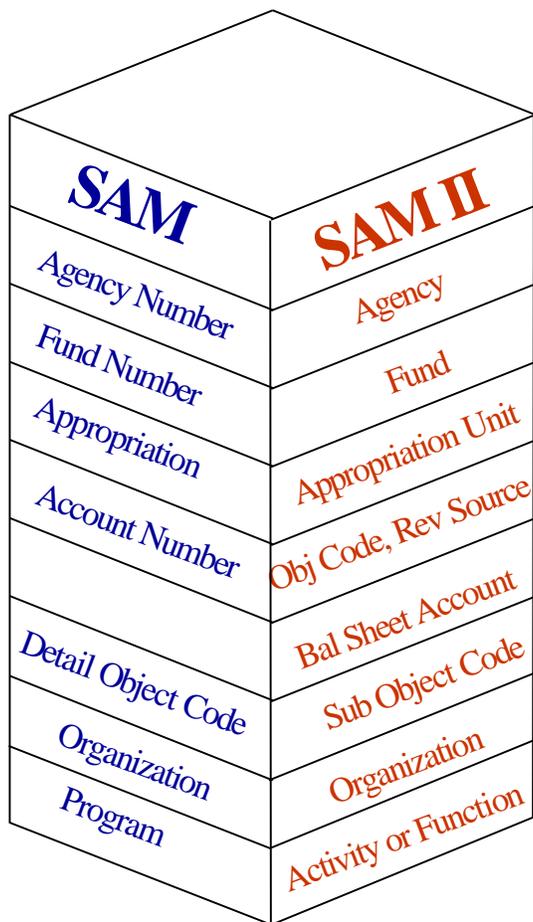
The HR/Payroll Data Warehouse Web Based Front-End offers a powerful means of reporting. The Front-End application (Cold Fusion) accesses the same Database as Ad Hoc users, retrieves the data, formats it, and presents it to the Front-End user. This is considered the pretty, point and click, web-based, report generation application.

### **Data Warehouse Ad Hoc reporting**

The HR/Payroll Data Warehouse database will support Ad hoc reporting. This will take place on the Back-End. The Back-End consists of a DB2 Database loaded using COBOL programs with embedded SQL.

Agency users may access information directly from the database using an Open Database Connectivity (ODBC) Reporting or Database tool, such as FOCUS, MS Access, Crystal Reports, or Impromptu. FOCUS users may use the Office of Administration's EDA gateway to access the SAM II Data Warehouse database. This ability provides a mechanism to fulfill the vast majority of a given agency's internal reporting requirements. Agencies would use ad hoc reports to perform analyses of information in ways specific to that agency.

# SAM II CHART OF ACCOUNTS





## **RELATIONSHIP OF SAM II HR/PAYROLL AND SAM II FINANCIAL**

### **Chart of Accounts**

SAM II provides a common statewide Chart of Accounts for Accounting, Budget, Procurement, and Human Resources. Each of the Chart of Accounts elements (codes) represent a unique perspective from which accounting transactions are classified. The account code structure, in SAM II, provides user flexibility; it enables detailed coding for some agencies while allowing minimal coding for others.

The Chart of Accounts and related tables are shared between the SAM II Financial and SAM II HR/Payroll system.

### **Interface with Financial System**

Selected tables from the Financial System are copied into SAM II HR/Payroll for editing purposes. This allows for editing of personnel information based on valid accounting attributes and budgets. The accounting distribution consists of the following financial entities: fund, agency, organization, sub-organization, appropriation, activity, function, object, sub-object, job number, reporting category, revenue source and balance sheet account.

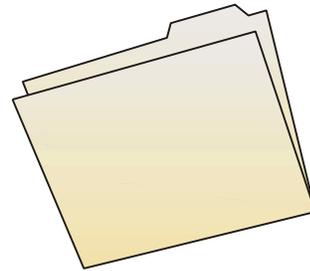


# HR DATA WAREHOUSE INFRASTRUCTURE



**A Database is like a  
file cabinet drawer.**

**A Table is like  
a file folder.**



**A record is like a single  
document in a file folder.**

**A Field is like one  
piece of data on a  
document.**





# HR DATA WAREHOUSE INFRASTRUCTURE

## Introduction to Databases

A **Database** is a group of related sets of data. Several different sets of data are often contained in one database if they are related to each other in any way. However not all sets of data in a database necessarily have to be related. For example the SAM II Financial information makes up one database, the SAM II HR/Payroll information makes up a second, and the SAM II Financial and HR/Payroll Data Warehouse information combined makes up a third database.

A **Table** is a collection of very related data. A database will contain one or more tables. A table contains information identifying and describing one or more physical or conceptual objects. For instance a table may identify employees and provide information such as addresses, contact phone numbers, and e-mail addresses.

A **Record** is a collection of individual pieces of data identifying and describing one individual object. A table contains one or more records. For instance a record will contain one employee, their identification number, address lines, city, state, zip, phone numbers, e-mail addresses, etc. Each record will only contain information for one unique object.

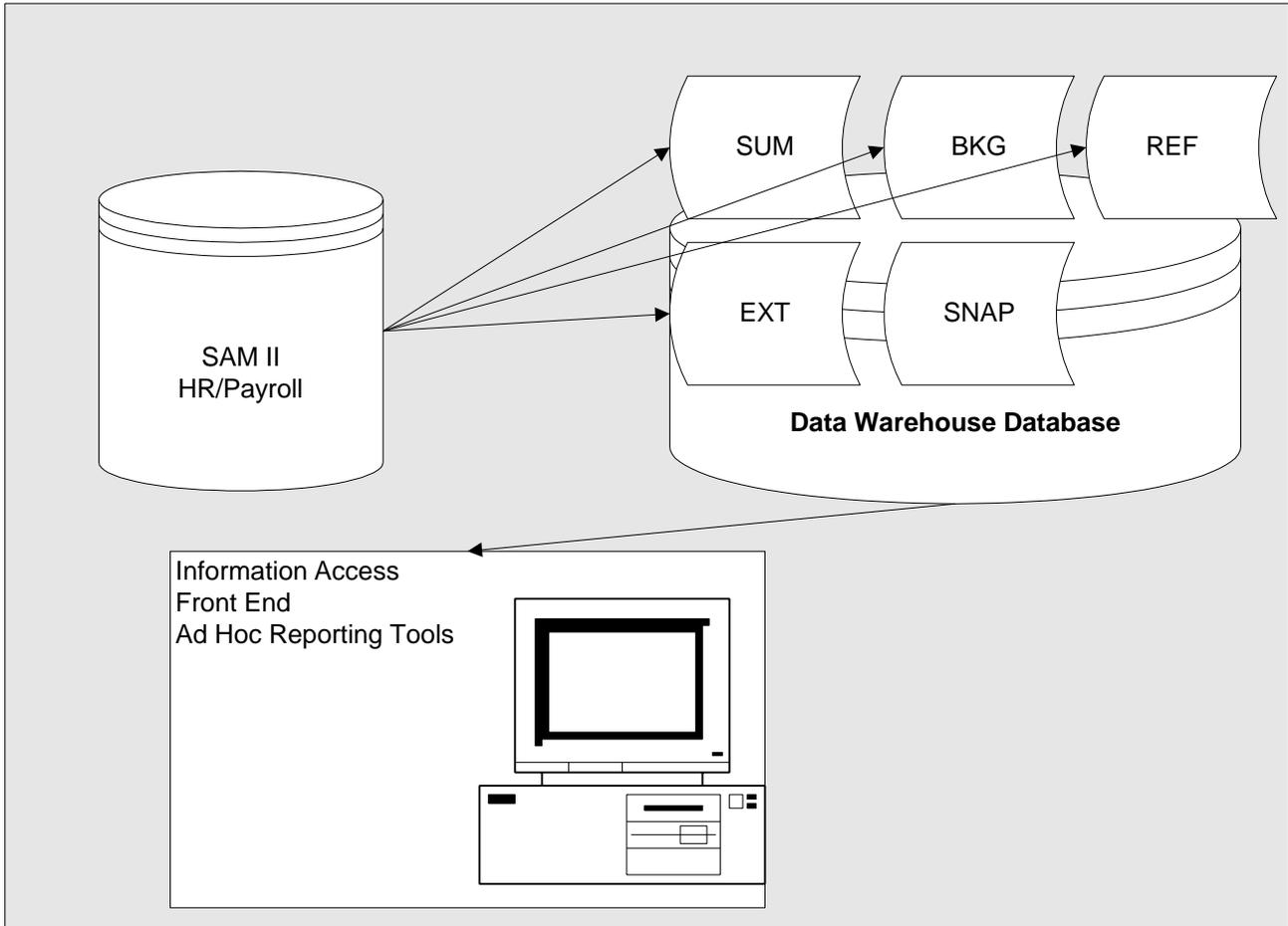
A **Field** is a single piece of information. A record contains one or more fields. For example an individual's Social Security Number might be held in a field. An individual's First Name might be held in it's own field. Each piece of information such as Middle Name, Last Name, Street Address Line, City, State, Zip5, Zip4, etc. would be placed in a separate field.

A **Primary Key** is one or more fields in a record that uniquely identifies that record. For instance a Social Security Number, or ID Number might uniquely identify an individual. If a record has more than one key field they are all required to uniquely identify that record.



# HR DATA WAREHOUSE INFRASTRUCTURE

## Table Types





# HR DATA WAREHOUSE INFRASTRUCTURE

## Table Types

The HR Data Warehouse organizes nearly 320 tables into main table types. The table types create the basic structure of the Data Model with nearly 7000 Data Elements contained within the fields.

The HR Data Model's main table types include the following:

- ❑ **Extract (EXT)**- These tables store pay, leave, and deduction data generated by the payroll process. These tables have the greatest level of detail, and are used to populate many other warehouse tables.
- ❑ **Background (BKG)**- In the operational system, these tables are updated whenever their related transactions are processed. These tables will be loaded in the HR Data Warehouse in order to maintain employee and position history records.
- ❑ **Reference (REF)**- Valid attributes for SAM II codes are stored on these tables. For example, every valid state and its short and long descriptions are stored on the State table.
- ❑ **Summary (SUM)**- These tables support the front-end tool by summarizing HR data for each business area.
- ❑ **Snapshot (SNAP)** is the value set for a table or group of tables for a given time slice, as of the time the snapshot was taken.

Each Table in the Data Model will also have a number of **VIEWS** associated with it. Views will capture another way to look at field information on a given table. These views will support the security requirements for access to the HR Data Warehouse.



## HR DATA WAREHOUSE INFRASTRUCTURE

### Field Types

- **Data fields:**
  
- **Time fields:**



# HR DATA WAREHOUSE INFRASTRUCTURE

## Field Types

Each table contains a number of fields, which contain the data elements. There are three main types of fields; data fields, time fields and key fields.

These fields consist of the following:

### **Data fields:**

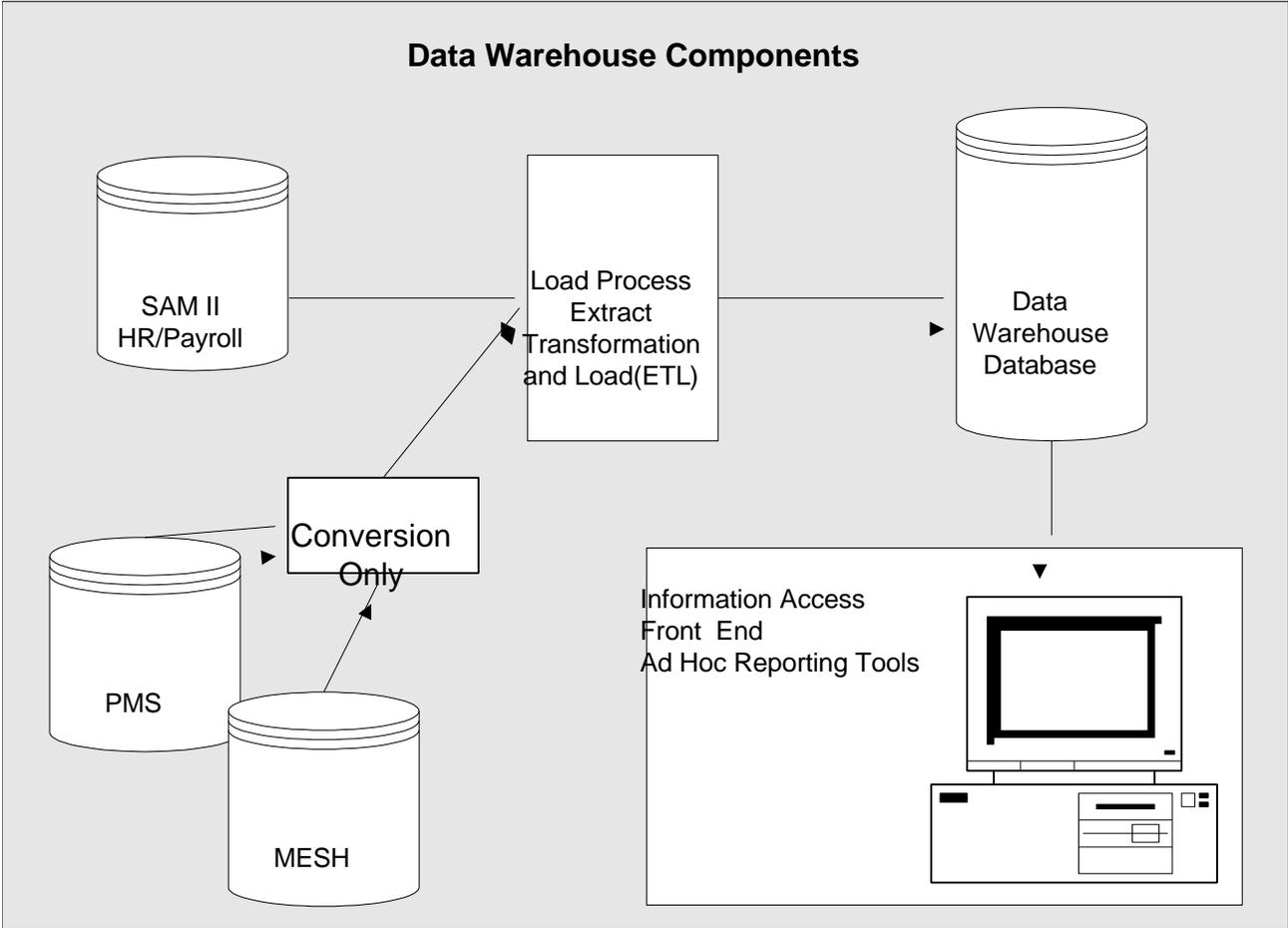
- ❑ Character fields
- ❑ Numeric fields
- ❑ Alpha-numeric fields
- ❑ Logical fields

### **Time fields:**

- ❑ Effective Date when used as a component of a primary key in SAM II, determines the first day on which the associated code and its attributes are valid.
- ❑ Expiration Date indicates the last day in a period of time after which a code and its attributes on an effective dated table are no longer considered valid.
- ❑ Time Stamp: Several fields that hold time have a time stamp for some activity.



# CONVERSION OF PMS AND MESH DATA





## CONVERSION OF PMS AND MESH DATA

The source data for the Data Warehouse will come from the MESH employee history and the PMS position history legacy systems and the SAM II conversion process. All subsequent updates will come from the SAM II HR/Payroll system. The legacy system history will be loaded to the same tables as the equivalent data from SAM II HR/Payroll providing user access to common data elements spanning the conversion period.

The HR Data Warehouse will contain summary and detailed employee, position, and payroll data from the SAM II HR/Payroll system starting with the first agency implementation.

At such time as each agency or group of agencies converts, applicable employee history data will be extracted from the MESH system and position data from PMS and loaded to the HR Warehouse. From the point that the last agency converts to SAM II, the HR Warehouse will become the only state system containing online access to this data. The resulting warehouse tables will support not only the warehouse web interface but also the SAM II HR/Payroll GUI interface in providing continued access to MESH and PMS historical data.

There are four types of data extracted from the MESH system:

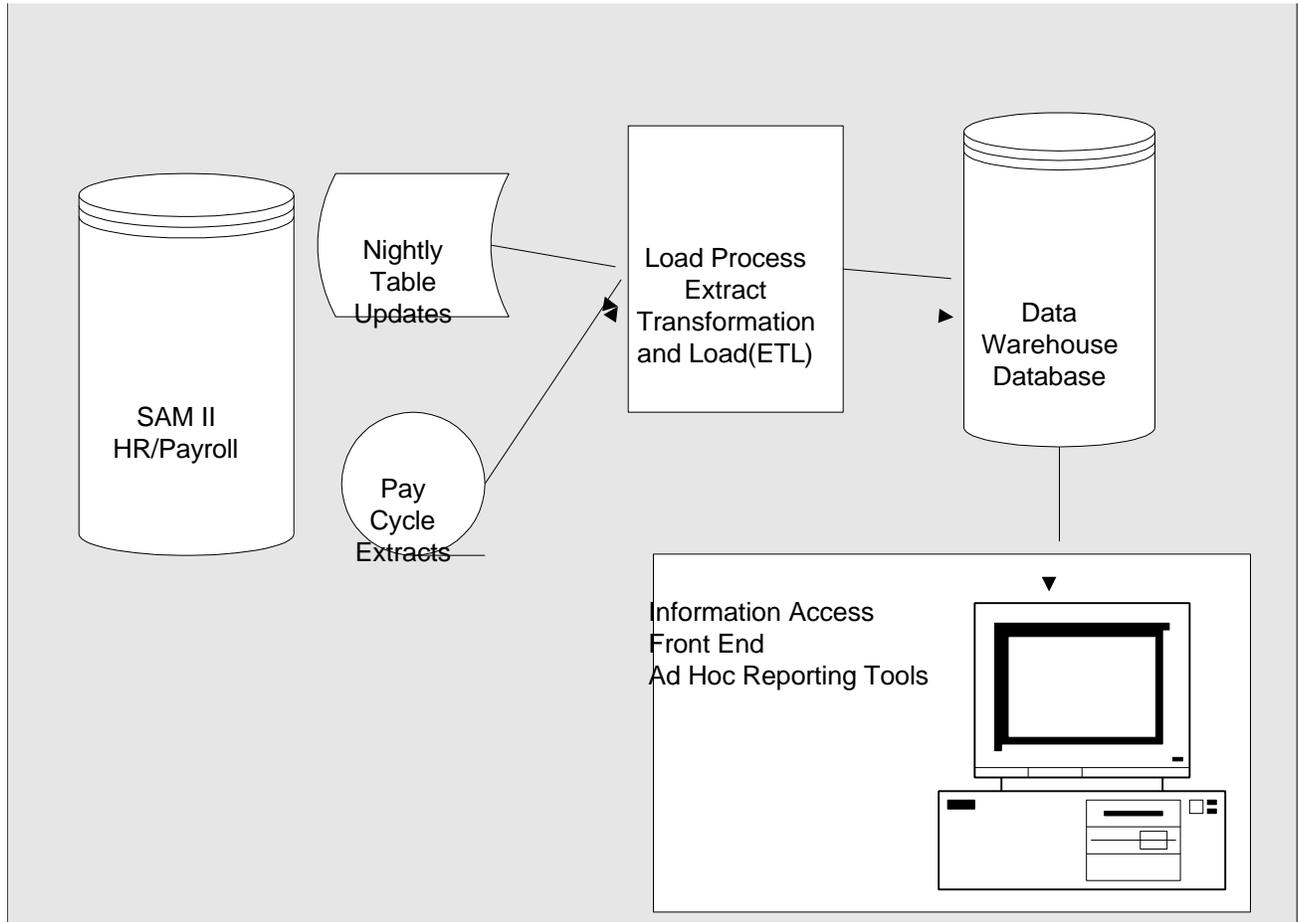
- ❑ Description - serves as a reference table defining codes
- ❑ Name History – all name changes
- ❑ History Detail – detail records on assignments
- ❑ Remarks – tied to an individual employee and personnel action

Types of data converted from the PMS system:

- ❑ Position History
- ❑ Position Description



# NIGHTLY AND PAY CYCLE INFORMATION LOAD (ETL)





## NIGHTLY AND PAY CYCLE INFORMATION LOAD (ETL)

*Extract Transformation and Load (ETL)* refers to the process of selecting and moving data from operational systems, sorting and possibly summarizing, reformatting and loading the data to the Data Warehouse tables.

Once loaded, the HR Data Warehouse will be updated nightly except for payroll related data which will be updated after each payroll run.

After each SAM II payroll, there is a set of sequential file extracts produced by the system that detail the payroll activity for the pay cycle. Extraction of these files is essentially a process of converting the records for each file to the warehouse format and otherwise preparing them for upload.

A Pay Cycle calculates and accumulates gross payments such as base pay, FLSA pay, fringe pay, reimbursable pay, leave cascading to pay, and also processes deductions and determines net pay amounts. The main output of this process is the Pay Cycle Extraction File (PCEF).

The Extract files for the HR Data Warehouse include:

- ❑ PCEF – Pay Cycle Extraction File
- ❑ XPAYD – General Ledger Pay Detail Extraction File
- ❑ XDEDD – General Ledger Deduction Detail Extraction File
- ❑ LVEX – Leave Balance Extraction File



# NOTES



## EFFECTIVE DATED TABLES: DE-NORMALIZED AND NORMALIZED DATA

Effective dating is a feature of SAM II HR/Payroll that allows for the entry of personnel transactions to be effective at designated dates, future dates, or prior dates. Most tables in SAM II HR feature records that have an Effective Date and an Expiration Date. The effective dating functionality is pervasive throughout SAM II HR/Payroll.

Most tables in the SAM II HR/Payroll Data Warehouse database are normalized. *Normalization* is the process of splitting information up into separate tables where the information is not repeated between tables and the information on a record strictly identifies and describes the keys of that record. Related data that has been normalized onto separate tables can be reconnected using a *Join*.

Some tables in the SAM II HR/Payroll Data Warehouse database are de-normalized to a certain degree. *De-normalization* is the process of merging columns of data from one table onto another related table. By allowing this redundancy between tables a single table it can be used alone and not require joins to other tables. This provides for simpler report construction and faster response time. As changes occur, these changes are recorded to any de-normalized tables.