

# ETL Process and Architectural Overview

## Business Objects Server

**XS Dashboards**  
The XS dashboards contain scorecards, perspectives, objectives, and key performance indicators (KPIs).



**Universes and Analytic Views**  
The universes provide business-oriented views of the data and act as an interface between the data warehouse and the components that display the data. The universes contain a schema of the tables and joins in the data warehouse. They also contain analytic views that ensure the consistency and quality of the data.



## Business Objects Server

**FPA Dashboards**  
The FPA dashboards provide a convenient, interactive view of actual versus planned performance.

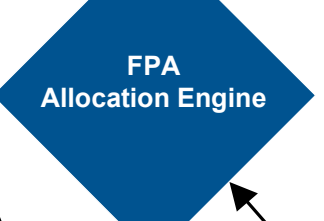
**FPA Analytics**  
The FPA analytics summarize or aggregate data to help managers identify trends, analyze volumes of data, plan, forecast, and make business or strategic decisions.

## Web Application Server

**XS KPI Engine**  
The Executive Scorecard KPI engine calculates the value of a KPI using the formula specified for the KPI and provides the status and score for the KPI using the thresholds specified for the KPI.

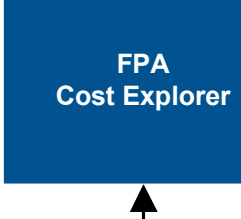


**FPA Allocation Engine**  
The FPA allocation engine provides to the FPA web application status information about allocations when stages or rules change.



## Web Application Server

**FPA Cost Explorer**  
The FPA cost explorer tool provides multidimensional cost analysis. It enables you to interactively view and filter allocation results in the form of charts that show variance between planned and actual costs.

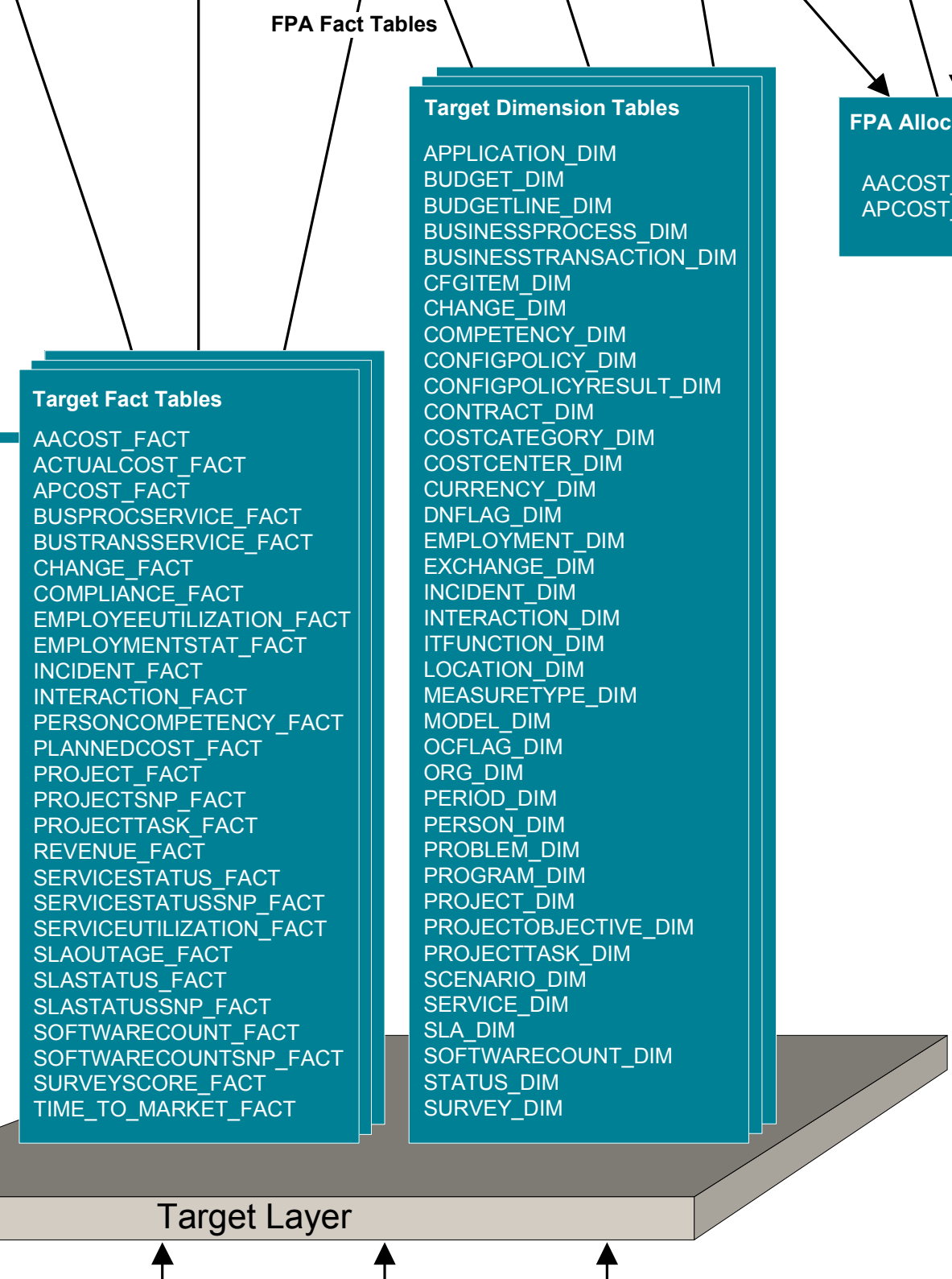


## Web Application Server

## Web Application Server

## DW Target Database

**Target Tables**  
The data warehouse target tables contain the data the applications use for reporting purposes. The data resides in standard fact and dimension tables.



## DW Target Database

**FPA Allocation Views**  
The allocation views contain allocation scenarios, stages, and rules.

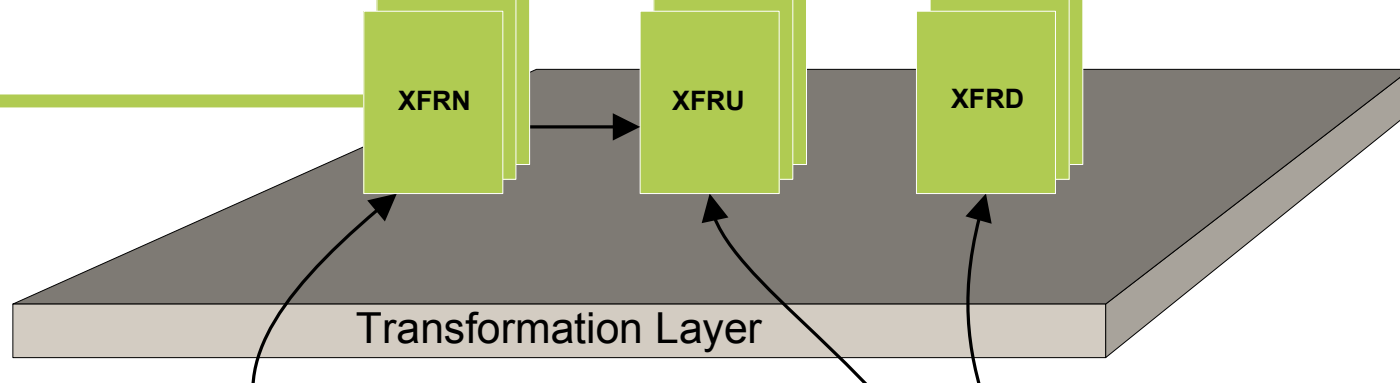


## DW Target Database

## DW Target Database

## DW Staging Database

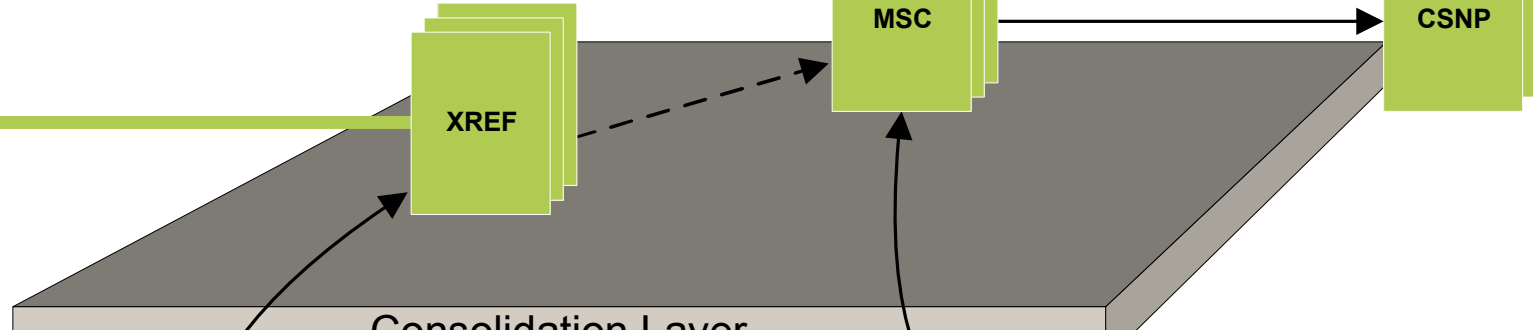
**Dimensional Transform (XFR)**  
The Transformation Layer contains load-ready tables in the structure of the target tables. Load-Ready New (XFRN) tables contain new records, Load-Ready Update (XFRU) tables contain records that need to be updated, and Load-Ready Delete (XFRD) tables contain records that have been flagged as deleted.



## DW Staging Database

## Consolidation Layer

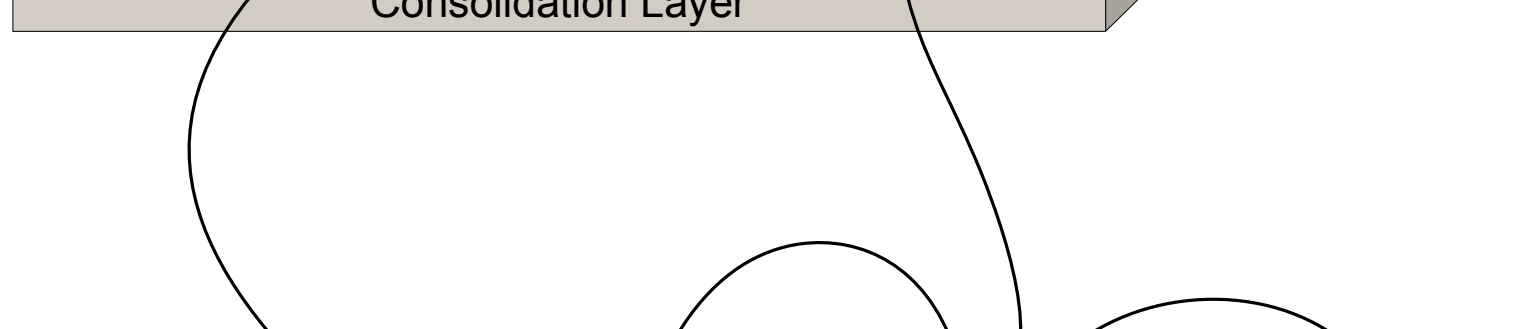
**Multiple Source Consolidation (MSC)**  
The Multiple Source Consolidation (MSC) tables contain data from the MSI tables that is combined into a single consolidated entity.



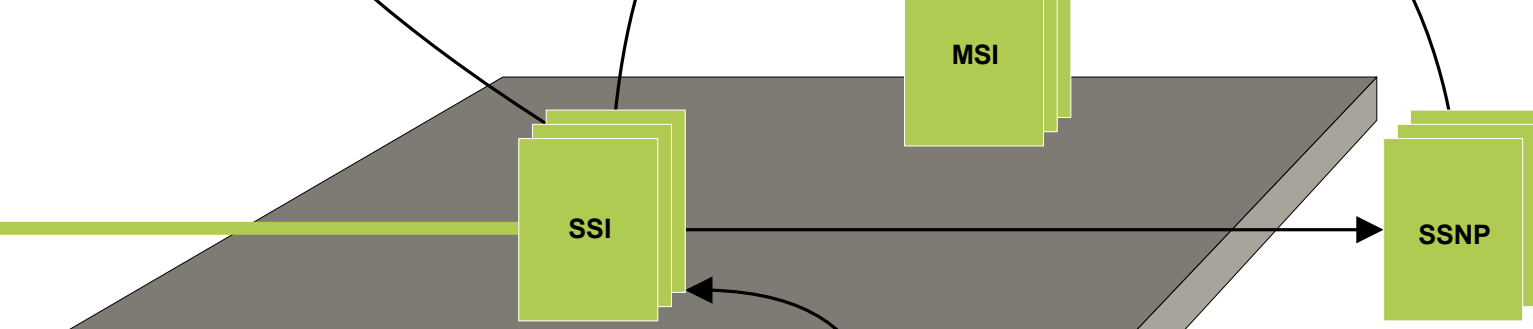
## Consolidation Layer

**Consolidated Snapshot (CSNP)**  
The Consolidated Snapshot (CSNP) tables contain the data from the MSC tables as it existed at the end of the previous ETL cycle. The ETL process uses data in the CSNP tables to determine whether a record is new, updated, or deleted.

**Cross Reference (XREF)**  
The Cross Reference (XREF) tables contain descriptions of enterprise key to business key relationships, source entities, consolidated entities, and priority relationships. The ETL process uses this information to combine data records from different source models into a single record in the consolidation model.

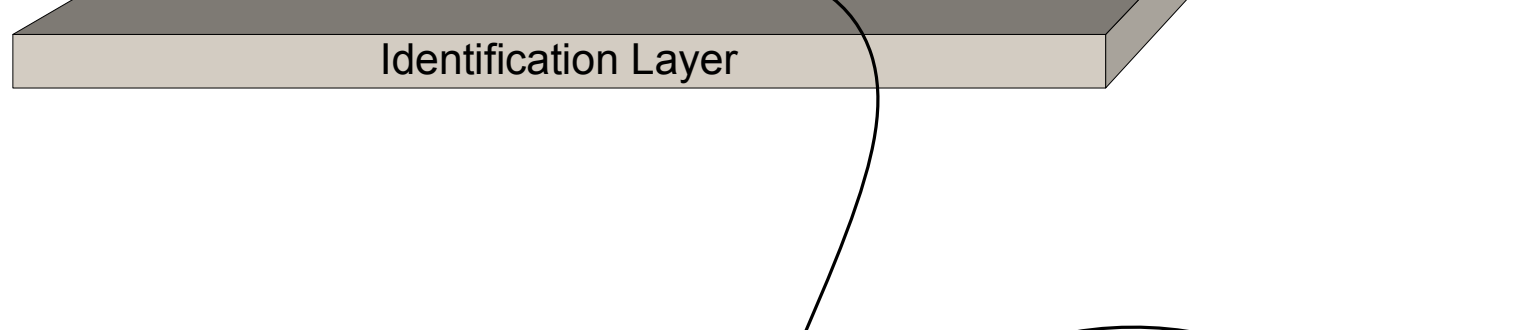


**Multiple Source Identity (MSI)**  
The Multiple Source Identity (MSI) tables contain data from the SSI tables with the addition of the enterprise key.



**Single Source Identity (SSI)**  
The Single Source Identity (SSI) processes restructure the diverse source system data from the EXT tables into standard structures. The SSI tables contain this conformed data.

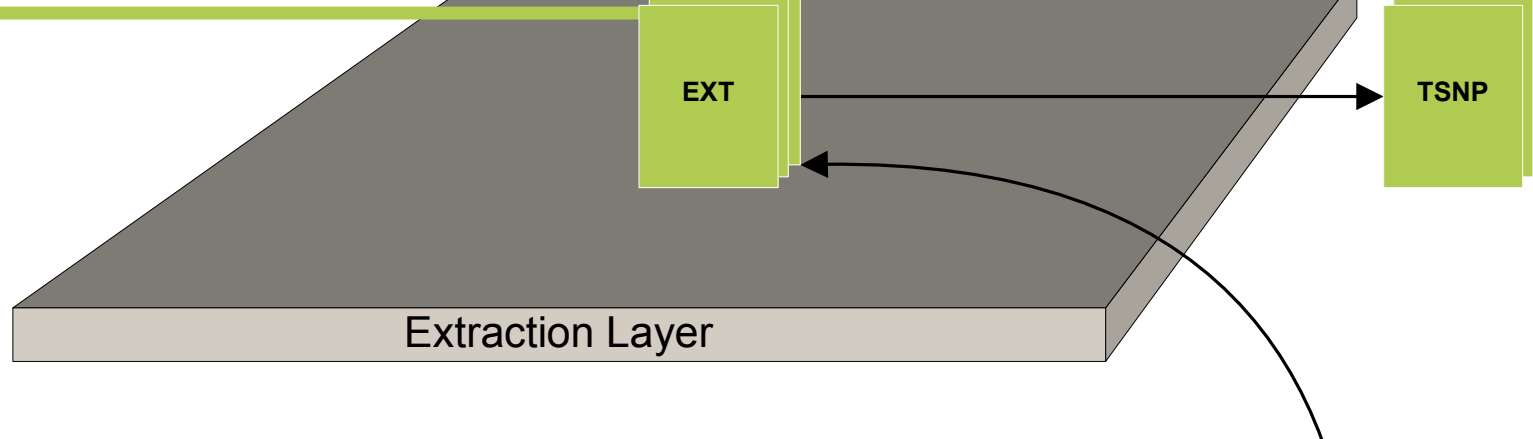
Since the data warehouse uses data from multiple source systems that do not use the same business keys for the same entities, the ETL process creates an internal enterprise key to link entity records. The ETL process uses data in the SSI tables to generate these enterprise keys, which are used during the consolidation process.



**Single Source Snapshot (SSNP)**  
The Single Source Snapshot (SSNP) tables contain the data from the SSI tables as it existed at the end of the previous ETL cycle. The ETL process uses the SSNP tables as part of the process to backfill the MSI tables.

## Extraction Layer

**Extract Staging Tables (EXT)**  
The Extract Staging (EXT) tables store data in database form. After validating the data, the ETL process loads data from the EXTRACT\_FF and EXTRACT\_DELETE\_FF flat files and alternate source spreadsheets into the EXT tables. The EXT tables also contain pre-fill records from the Transactional Snapshot (TSNP).



## Extraction Layer

**Transactional Snapshot (TSNP)**  
The Transactional Snapshot (TSNP) tables contain a version of the source data as it existed at the beginning of the previous ETL cycle. The ETL process uses the TSNP tables to identify deleted records by comparing the business keys in the EXTRACT\_DELETE\_FF flat files to the business keys in the TSNP tables. If a key exists in the TSNP tables but not in EXTRACT\_DELETE\_FF, the ETL process identifies the associated record as a deleted record and loads it into the EXT tables. The ETL process also uses the TSNP tables as part of the pre-fill process.

## DW Staging Database

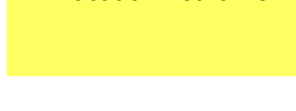
## DW Staging Database

## File System

**Alternate Sources**  
Alternate sources use Excel spreadsheets as a platform. Use the alternate source spreadsheets to load into the data warehouse data from a non-HP data source. The ETL process extracts data from the alternate source spreadsheets to flat files.

- Alternate Sources**
- ALT\_ACTUALCOST.xls
  - ALT\_CFGITEM.xls
  - ALT\_CHANGE.xls
  - ALT\_CONTRACT.xls
  - ALT\_COSTCENTER.xls
  - ALT\_EMPLOYMENT.xls
  - ALT\_EXCHANGE.xls
  - ALT\_INCIDENT.xls
  - ALT\_INTERACTION.xls
  - ALT\_LOCATION.xls
  - ALT\_MODEL.xls
  - ALT\_ORG.xls
  - ALT\_PERSON.xls
  - ALT\_PLANNEDCOST.xls
  - ALT\_PRPROJECTIVE.xls
  - ALT\_PROJECT.xls
  - ALT\_PROJECTTASK.xls
  - ALT\_REVENUE.xls
  - ALT\_SERVICE\_DIM.xls
  - ALT\_SERVICESTATUS\_FACT.xls
  - ALT\_SLADIM.xls
  - ALT\_SLAOUTAGE.xls
  - ALT\_SLASTATUS.xls
  - ALT\_SURVEY.xls
  - ALT\_SURVEYScore.xls
  - ALT\_TIME\_TO\_MARKET.xls

**FPA Allocation Metric Spreadsheet**  
The FPA Allocation Metric Spreadsheet enables you to use metric-based allocation to allocate costs based on values that change from period to period. This ETL process loads the data from this spreadsheet directly into the target tables.



**External Sources**  
External sources use Excel spreadsheets as a platform. Use the external source spreadsheets to consolidate data manually or use data from a non-HP data source. The ETL process loads some external source spreadsheets into the consolidation process (MSC tables) and some directly into the target tables.

- External Sources**
- APPLICATIONS.XLS
  - Budget.xls
  - CostCategory.xls
  - ITFUNCTIONS.xls
  - MeasureType.xls
  - PROGRAMS.xls
  - STATUS.xls

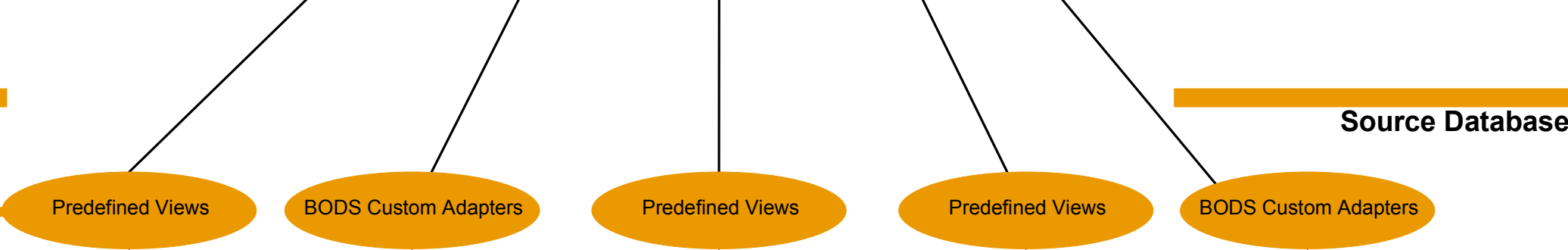
## File System

**Flat File Extracts**  
The extract processes extract data from the source systems and spreadsheets and write it to delimited flat files on the file system. The flat files (EXTRACT\_FF and EXTRACT\_DELETE\_FF) decouple the data warehouse data from the source systems. EXTRACT\_FF files contain records that were updated or inserted since the last time ETL ran. EXTRACT\_DELETE\_FF files contain the complete list of business keys from the source view and are used to identify delete records.



## Source Databases

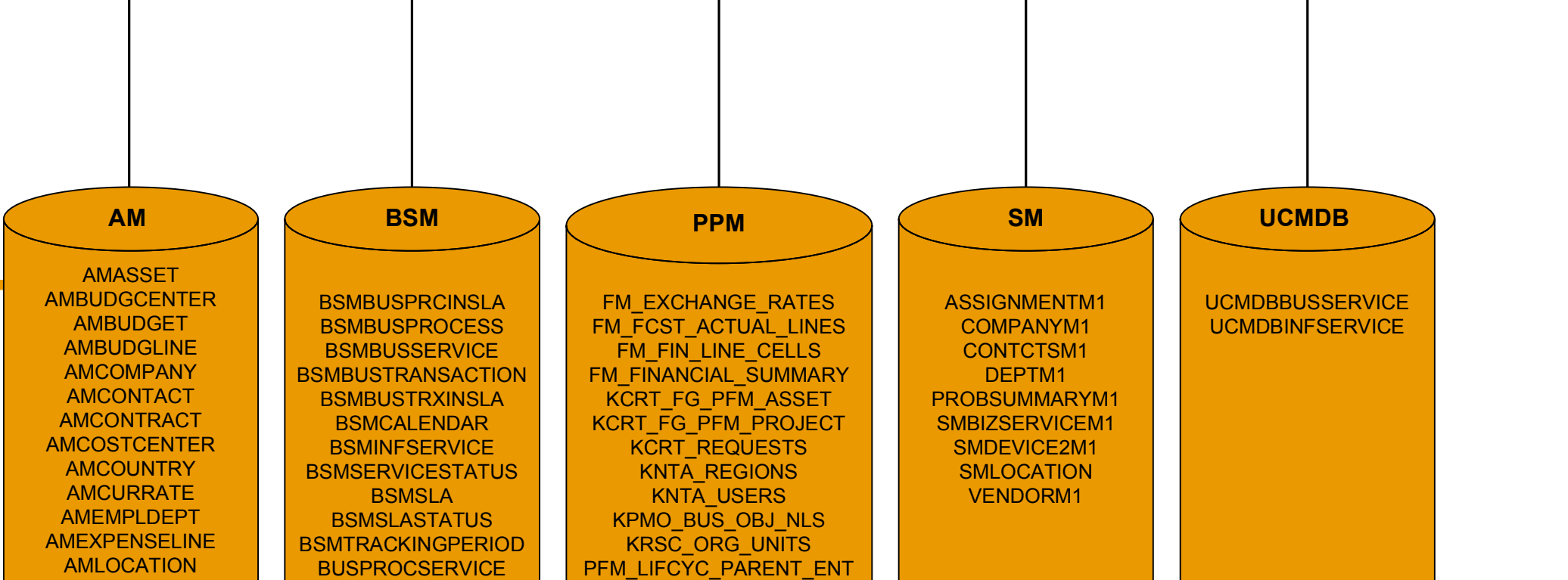
**Data Integration Interface**  
For AM, PPM, and SM, the data warehouse accesses source data through predefined views that contain the logic required to convert the data to a format that the extract process can use.



For BSM and UCMDB, the data warehouse accesses source data through BusinessObjects Data Services (BODS) custom adapters that rely on integration technologies such as Web services.

## Source Systems

The source systems contain the current source data. You can extract data from HP Asset Manager (AM), HP Business Service Management (BSM), HP Project and Portfolio Management (PPM), HP Service Manager (SM), and HP Universal Configuration Management Database (UCMDB). These source systems reside in remote databases managed by an RDBMS.



## Source Databases

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