SAP BW

Lesson 01: Overview and Terminology

Capgemini

Business Warehouse

Business Intelligence

➢ Definition

- Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to information to help a business make better business decisions.

Why it came that way?

- Over the years, software became bigger and more complex and the amount of data grew.
- ER models for Enterprise business scale have hundreds of logical entries(Eg. SAP has more than 15,000 tables for R/3),which are linked together.
- Millions of transaction per month made it more and more time consuming to get the data out of system -especially when the transactions are on going.

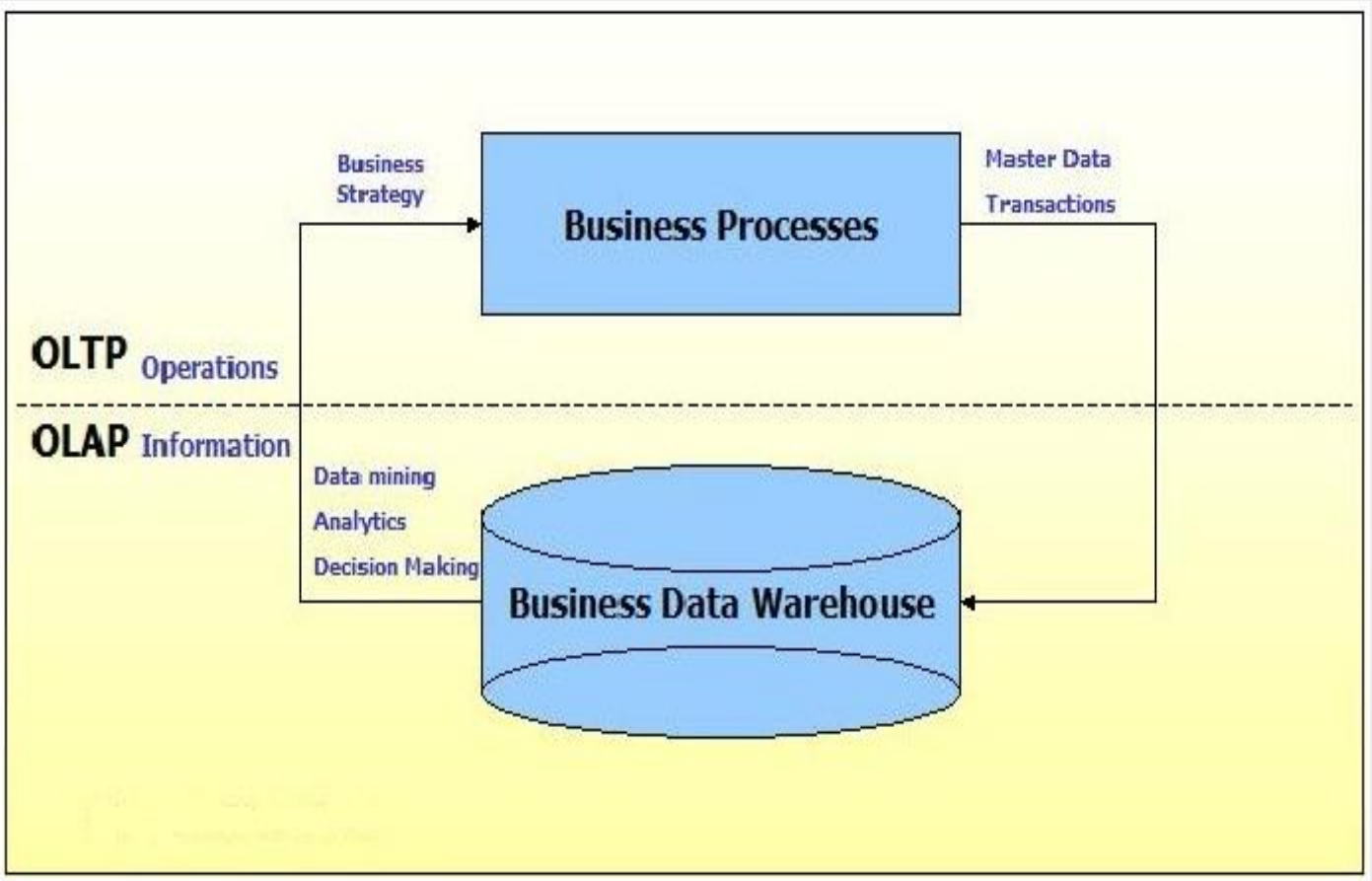
Solution needed

Three core problems can be seen for reporting in operational system.

a) Difficult navigation
b) Performance
c)Data merge with other applications

Part of the solution was to move all the data from transactional system to seperate system, which is optimized for analysis
purpose (user's don't do transactions).

OLTP(ECC) Vs OLAP (BW)



OLTP(ECC) Vs OLAP (BW)

	OLTP System Online Transaction Processing (Operational System)	OLAP System Online Analytical Processing (Data warehouse)
Source of data	Operational data; OLTPs are the original source of the data.	Consolidation data; OLAP data comes from the various OLTP Databases
Purpose of data	To control and run fundamental business tasks	To help with planning, problem solving, and decision support
What the data	Reveals a snapshot of ongoing business processes	Multi-dimensional views of various kinds of business activities
Inserts and Updates	Short and fast inserts and updates initiated by end users	Periodic long-running batch jobs refresh the data
Queries	Relatively standardized and simple queries Returning relatively few records	Often complex queries involving aggregations
Processing Speed	Typically very fast	Depends on the amount of data involved; batch data refreshes and complex queries may take many hours; query speed can be improved by creating indexes
Space Requirements	Can be relatively small if historical data is archived	Larger due to the existence of aggregation structures and history data; requires more indexes than OLTP
Database Design	Highly normalized with many tables	Typically de-normalized with fewer tables; use of star and/or snowflake schemas
Backup and Recovery	Backup religiously; operational data is critical to run the business, data loss is likely to entail significant monetary loss and legal liability	Instead of regular backups, some environments may consider simply reloading the OLTP data as a recovery method

Key Capabilities

Datawarehousing (SAP BW administrator Workbench)

- Extraction transformation & loading
- Datawarehouse management
- Business Modelling

BI platform

-Online analytical processing
-Data mining
-Alerting
-Metadata Repository
-Planning Framework

BI suite of tools (SAP BW Business Explorer)
-Query Design
-Managed reports and analysis
-Visualization- Web apllications & design
-Collaboration

Pre-configured Business content

Key Capabilities

Openness

- Open Hub service - dissemination of Information
- UD connect - directly access to data to relational database tables and OLAP systems.
- Supports industry standards(eg. XML, XML for Analysis, JDBC, etc)

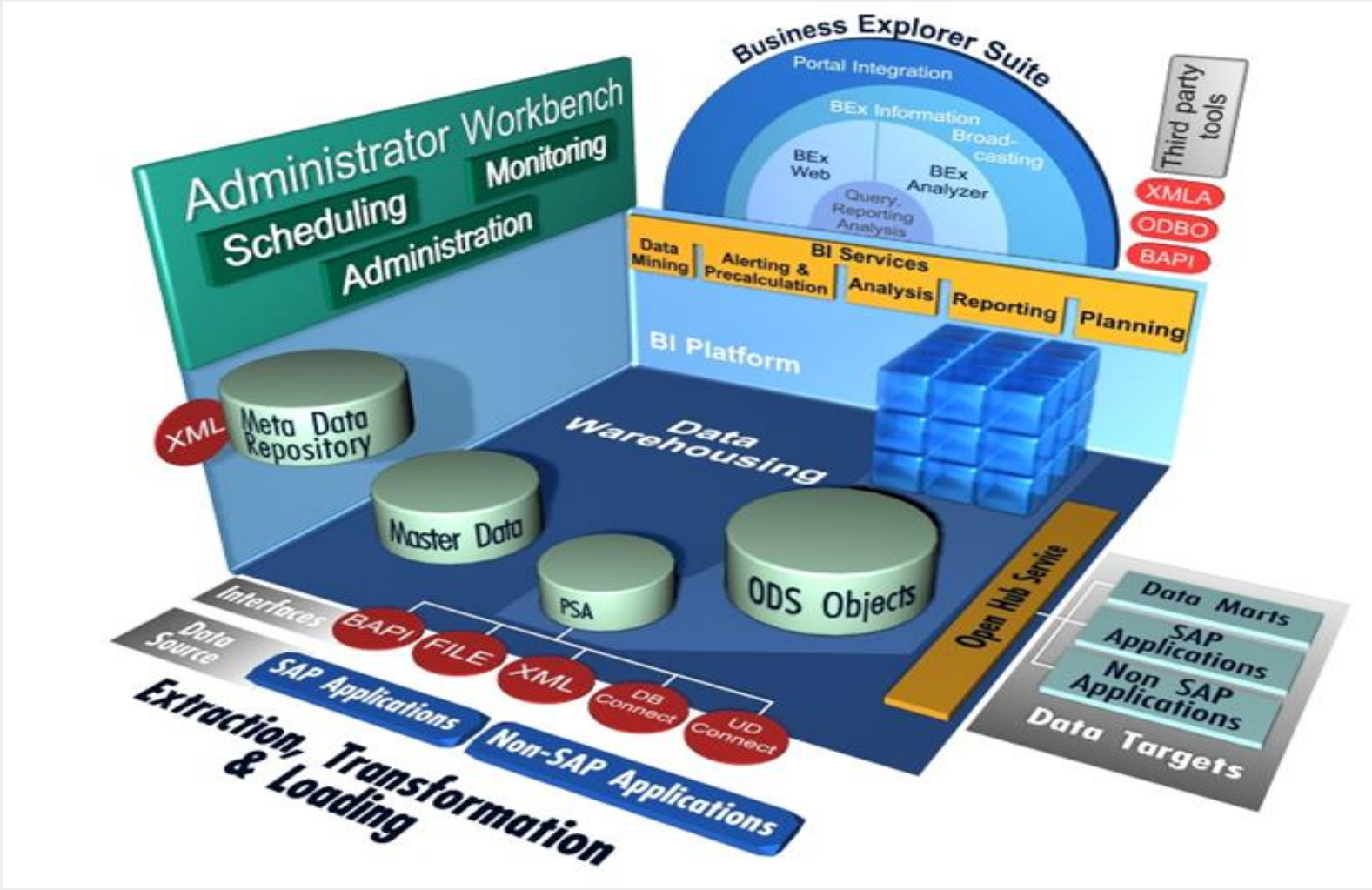
Integration

- Integration of technology, tools & applications allowing cross enterprise analytics & closed loop scenarios
- Integration of Enterprise portal as single point of Entry
- Integration of unstructured information such as files,documents, etc.

Web offerings :

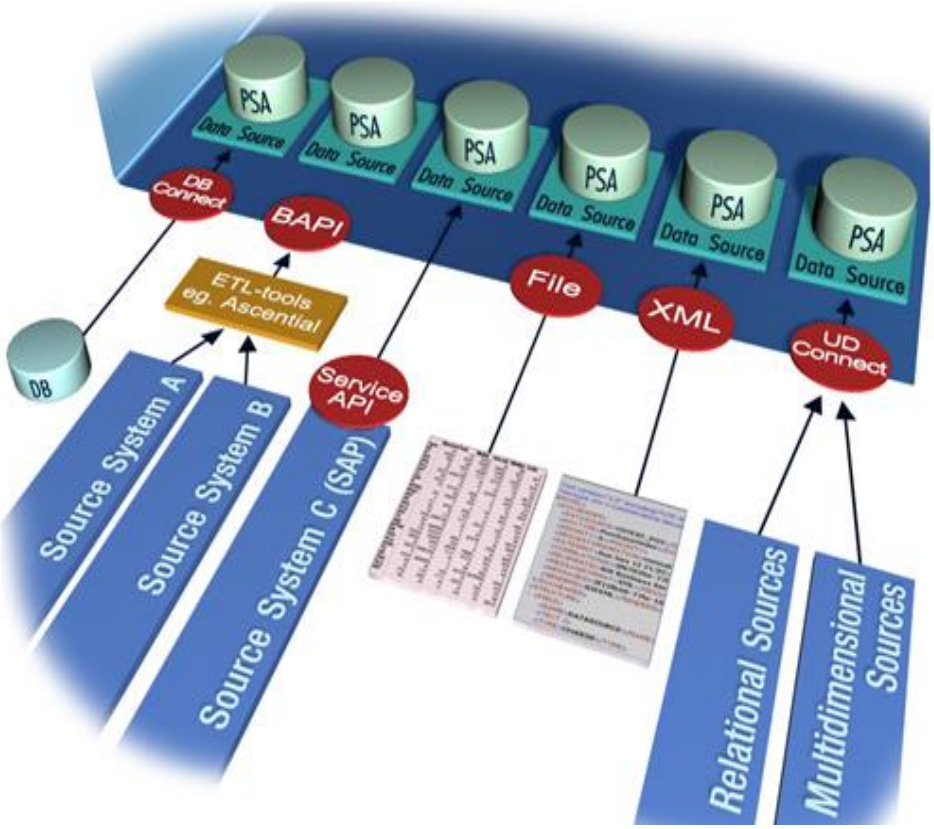
- Interactive analysis of Information, via web and mobile devices.
- Intuitive design of web applications
- Ad-Hoc design via Web

SAP BI Architecture



Data Warehousing & ETL (Extract, Transform & Load)

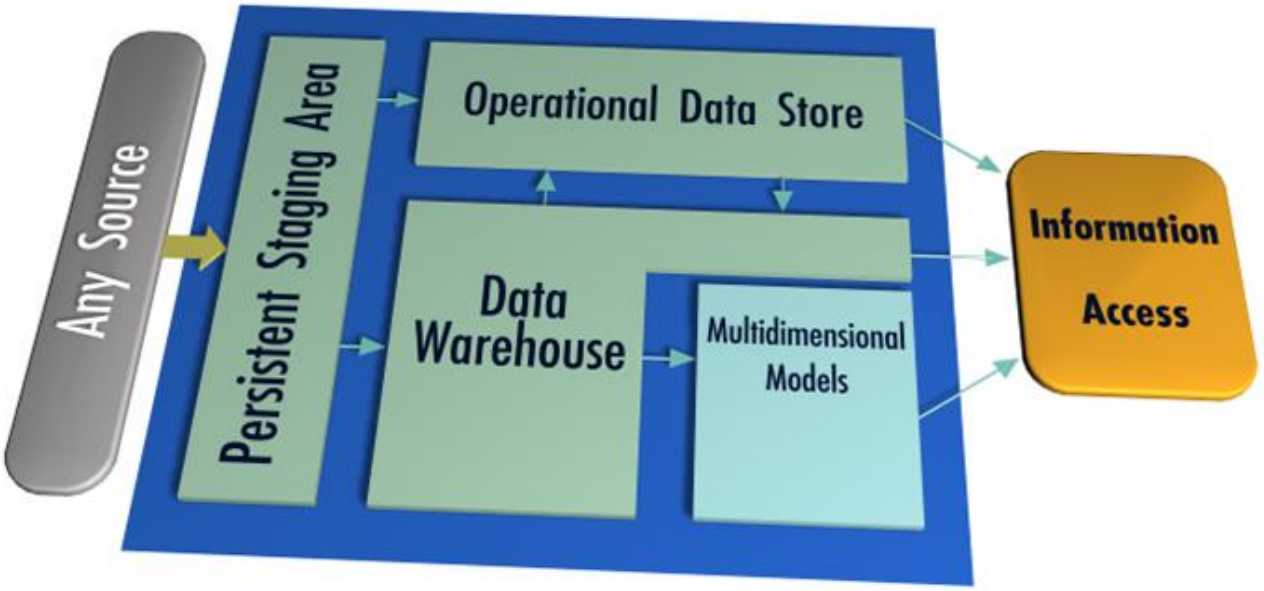
Data Warehousing



- Open for any source
- Flexible set of ETL capabilities
- Integration on application level
- Open to third-party tools
- Support of open standards

…to get a complete view of your business

Operational Data Store and Data Warehouse layer



Data Warehouse
- Non volatile
- Granular
- Integrated
- Historical foundation
- Built with ODS Objects

Operational Data Store
- Operational Reporting
- Near Real-Time / Volatile
- Granular
- Built with ODS Objects

Multidimensional Models
- Multidimensional analysis
- Aggregated view
- Integrated
- Built with InfoCubes

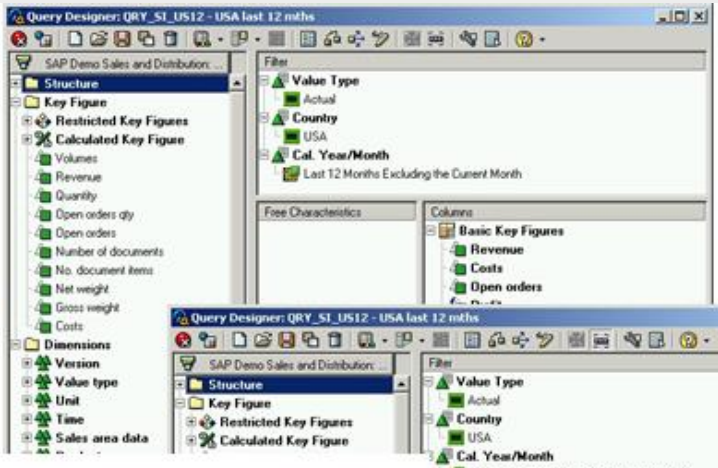
... to provide the right information for all users

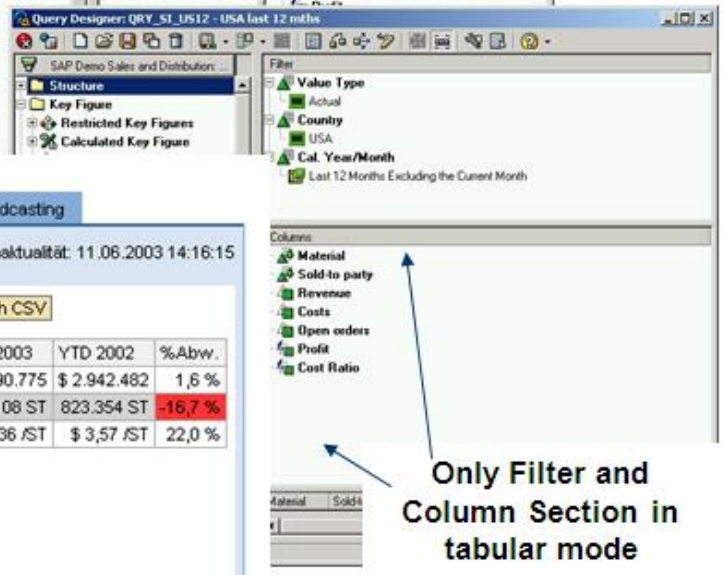
BI Platform

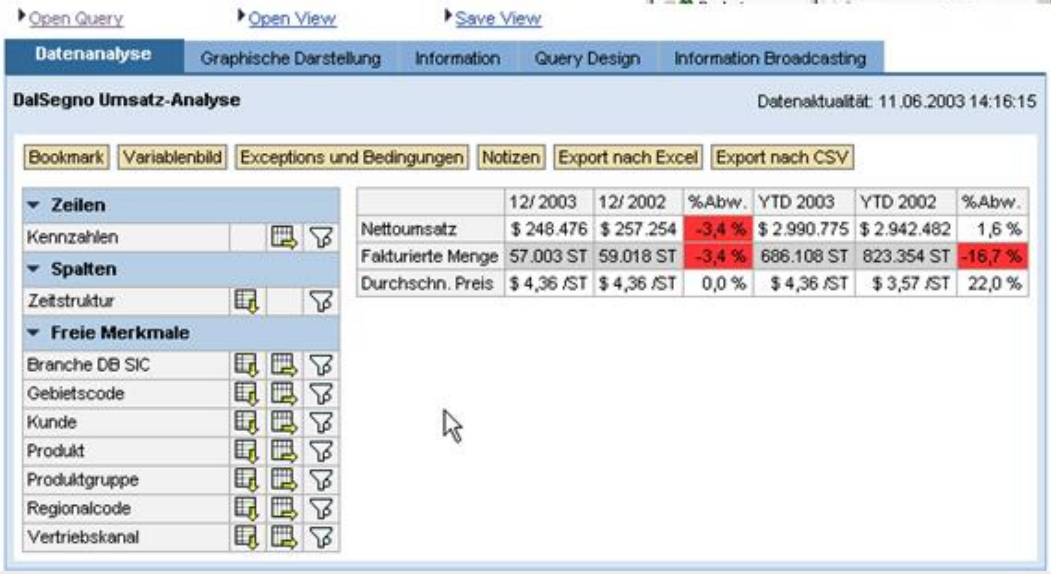
Query, Analysis and Reporting

BEx Query, Reporting & Analysis

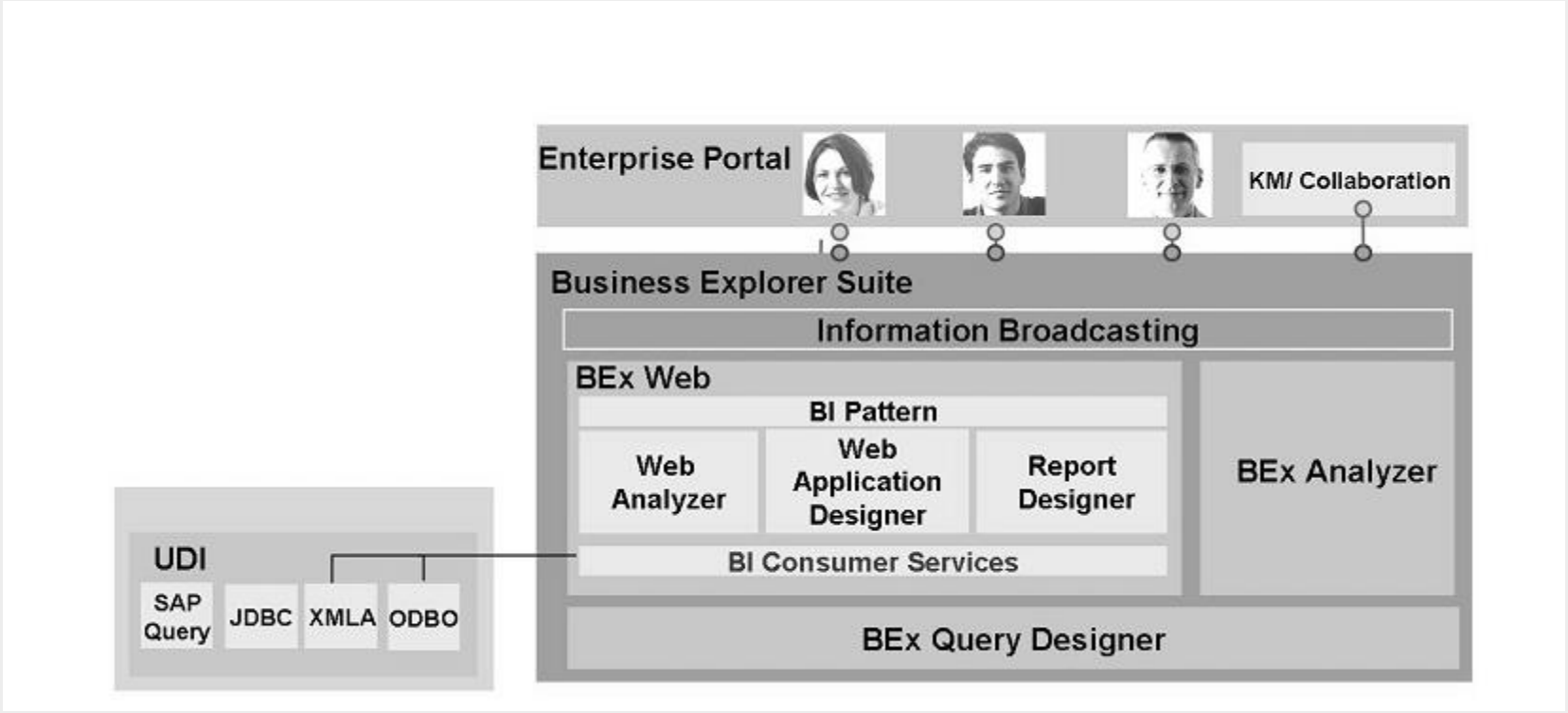
- Quick and easy design of interactive queries for analysis and reporting
- Analysis & Reporting via Web or embedded into MS Excel







Information Broadcasting



Authorization

Standard Authorizations

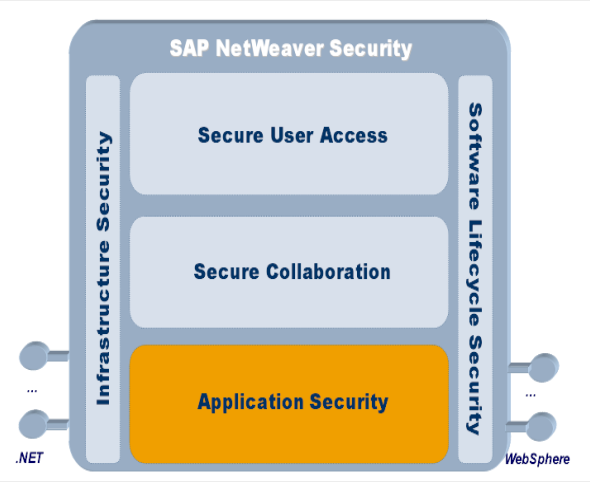
- Based on standard role and authorization concept of SAP
- Was and still are used for BI administrator and developer activities

Reporting Authorizations

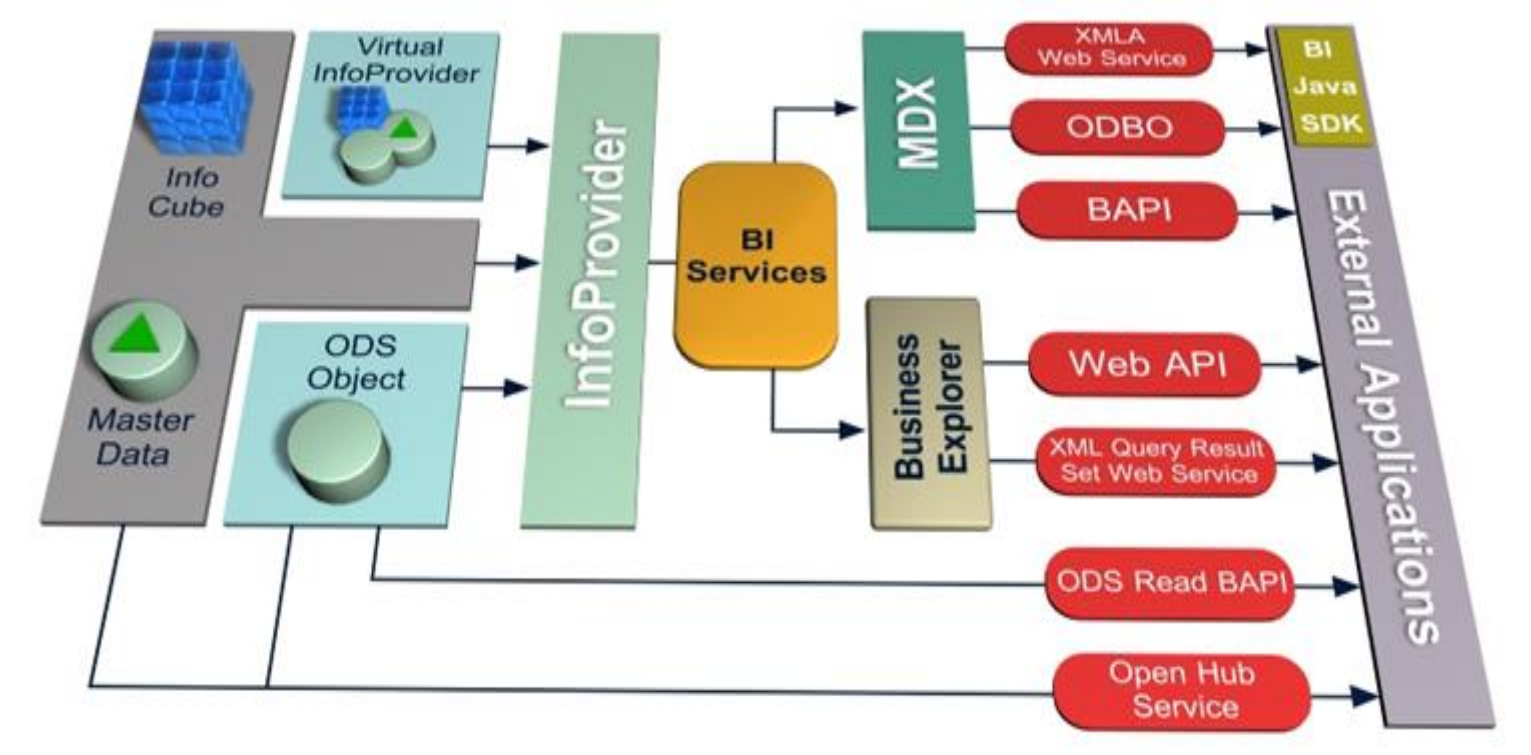
- Old security concept up to SAP NetWeaver '04 (up to SAP BW 3.5)
- Control for which data a user has access to in a query
- Realized through the standard authorization concept, which has many limitations

Analysis Authorizations

- New security concept as of SAP NetWeaver 2004s
- Is not based on standard authorization concept in order to overcome the limitations
- Takes features of reporting and analysis in BI into consideration



Open Analysis Interfaces



Business Content

Business Content

- Predefined, role-based and task-oriented information models
  - Provide technical definitions, such as extraction and transformation rules

- Predefined templates for reporting and analysis.
  - For various industries and business areas

Business Content Benefits

-Web enabled Immediate access to interpreted Information -

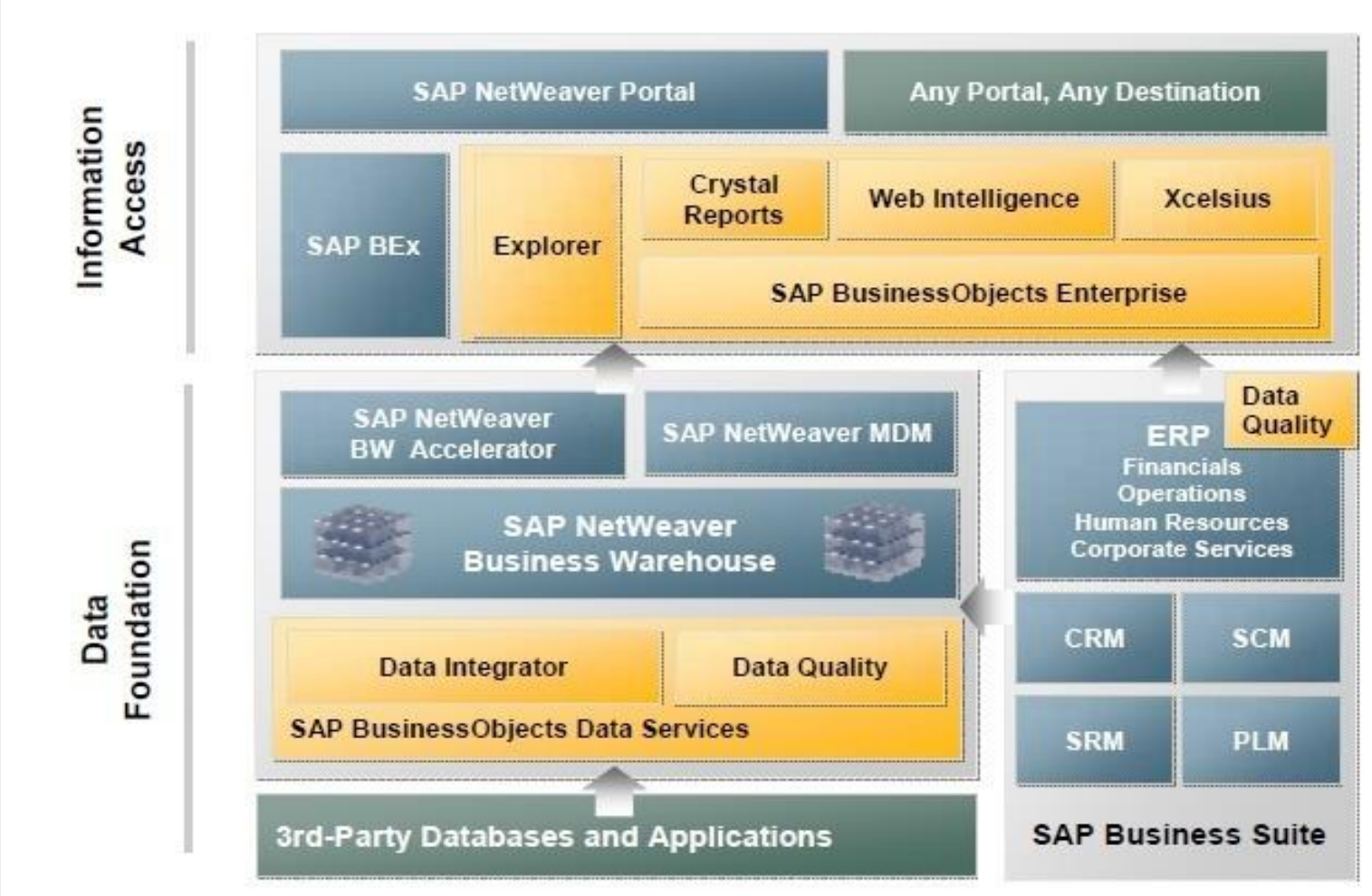
- ready to Go reports, data models, extractors, transformations
- Significant cut down implementations & costs
- Easily extensible

Consistency:
-Integrated view of corporate data

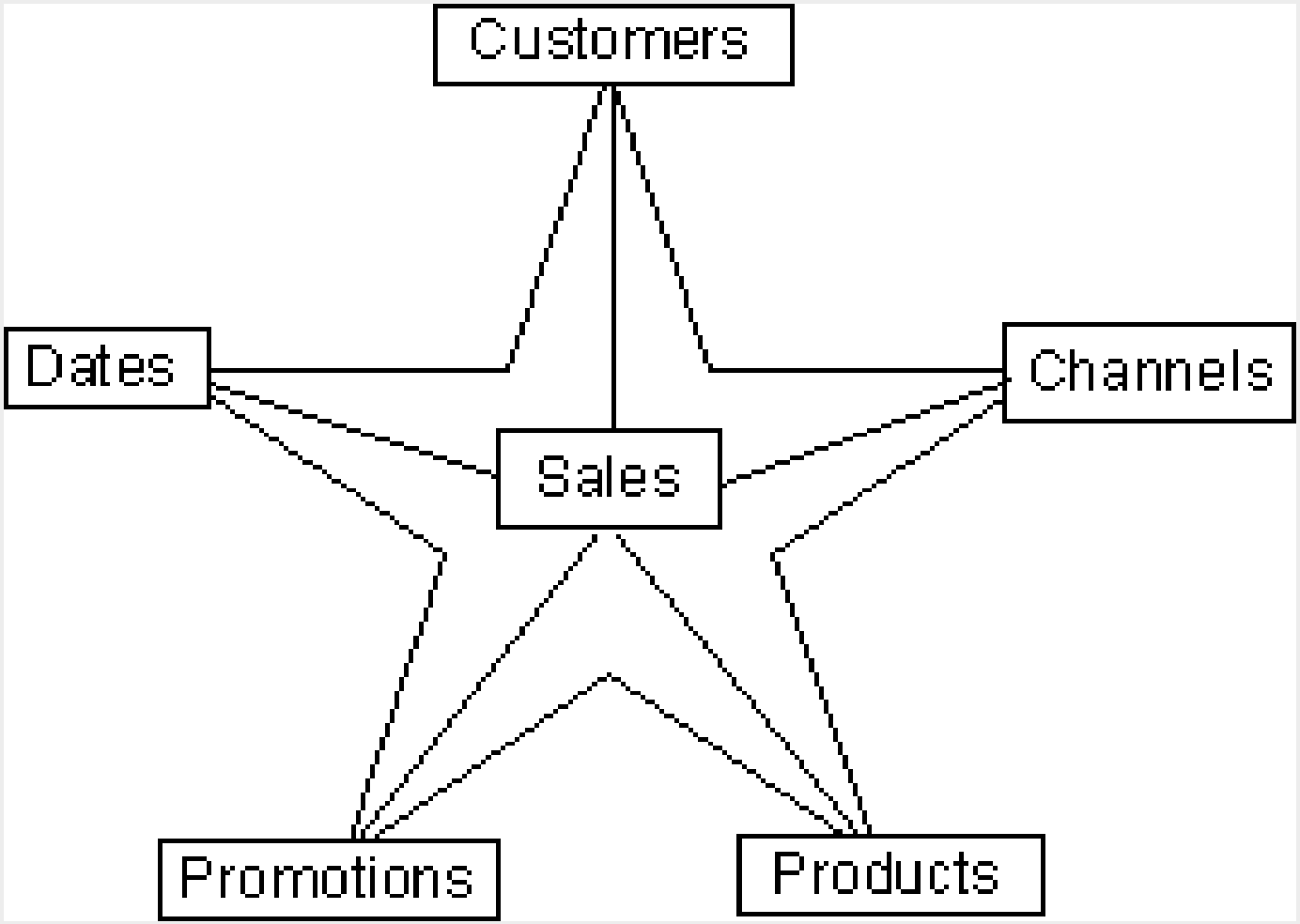
Validated & comparable information
-Rich set of standard key performance indicators
-Best practice models

Cross system/Cross applications
-Integration of E business & ERP systems
-Tight integration with MYSAP applications
-Integration with non-SAP data

The new intelligence platform
Value added within an SAP landscape

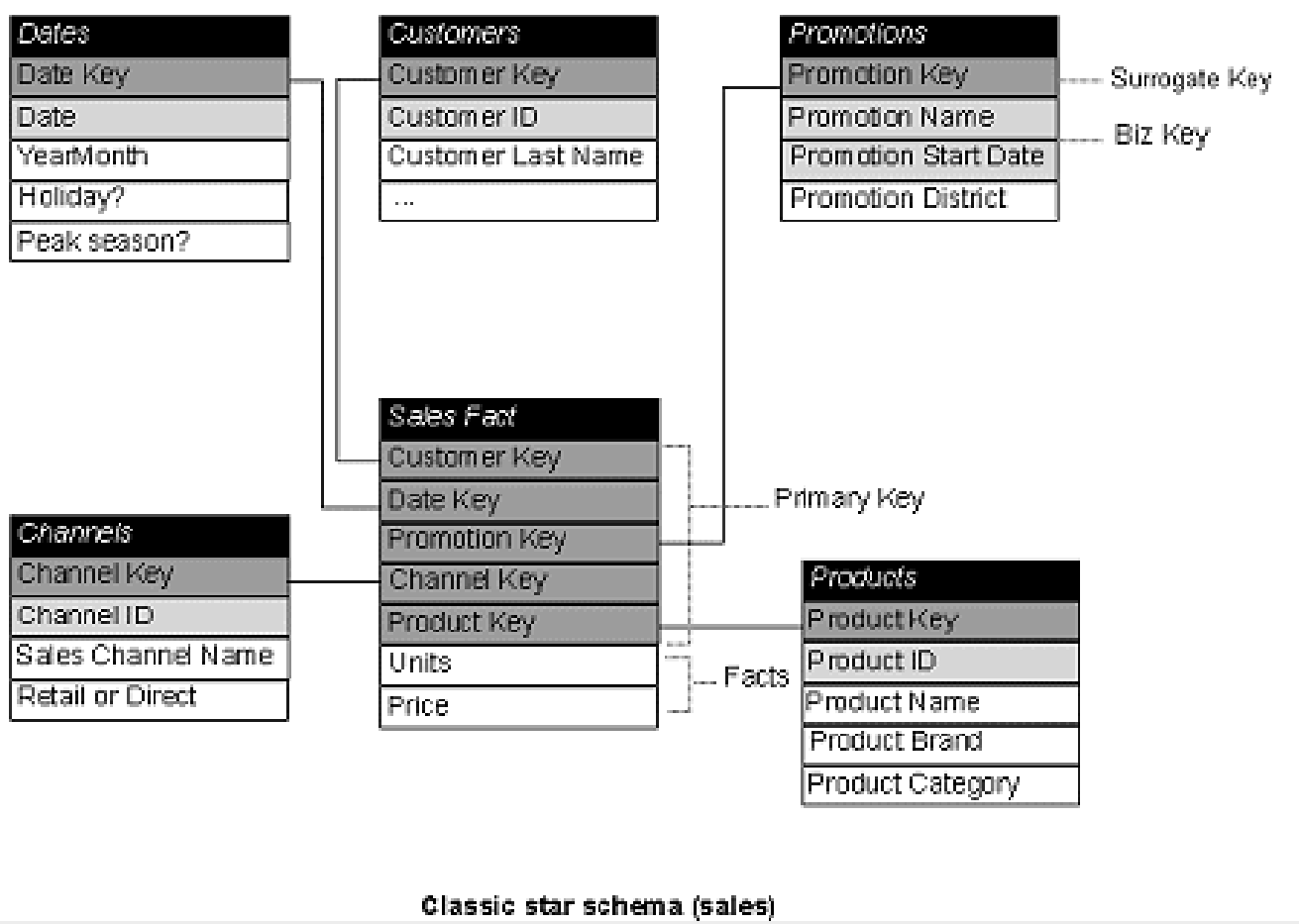


Data Warehouse Star Schema



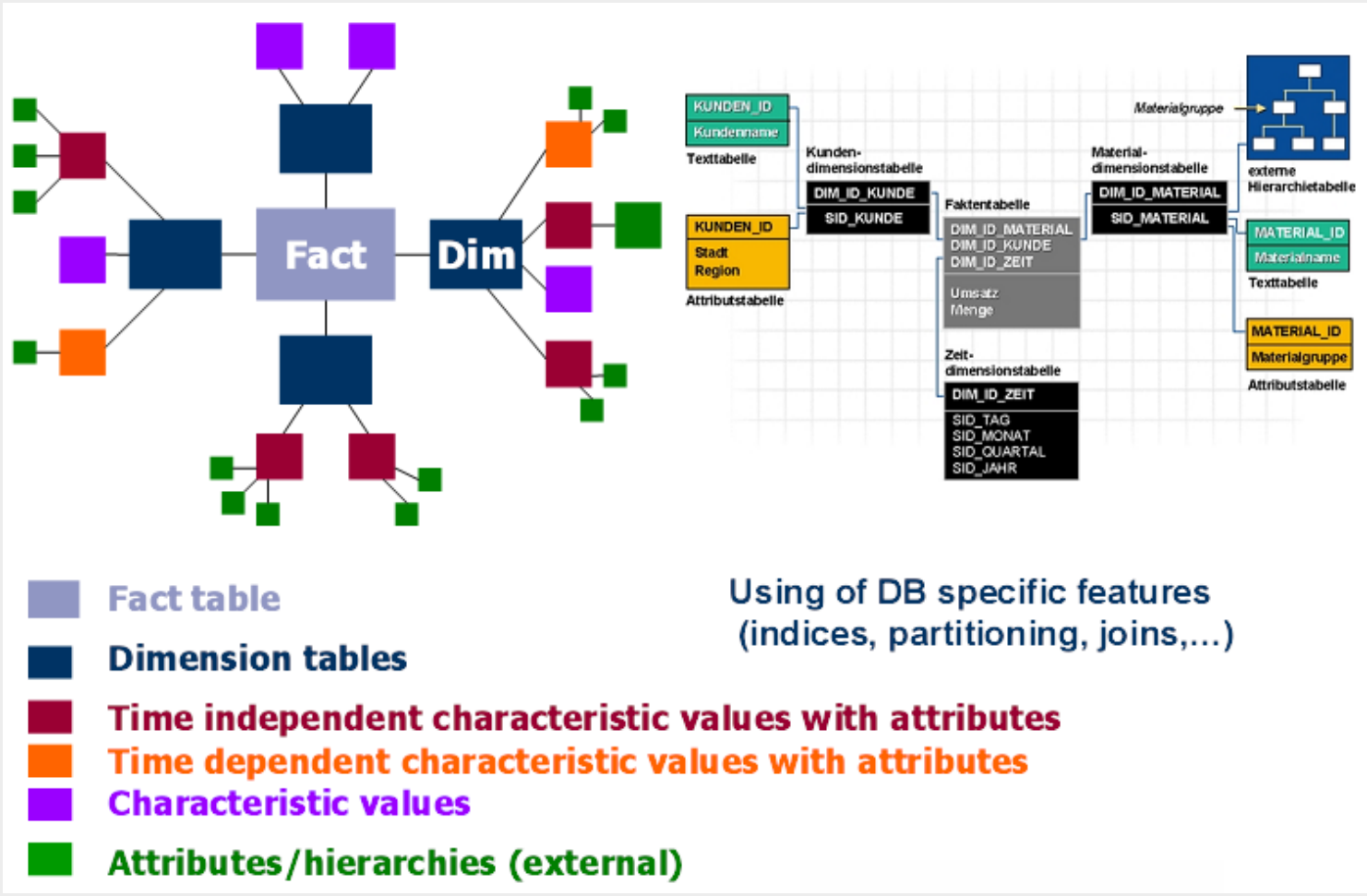
Classic Star Schemas

➢A schema is called a *star schema* if all dimension tables can be joined directly to the fact table. The following diagram shows a classic star schema.



Classic star schema (sales)

Infocube - Extended Star Schema



Enterprise Data Warehouse Architecture

➢Consolidating data warehouse layers that were not developed together may produce following inconsistencies

- Uncontrolled data flows
- Multiple extraction of the same data
- Local BI initiatives (without a global agreement)
- Several inconsistent data models
- Silos, standalone systems
- An unreliable corporate information basis (unreliable headquarter reporting)
- Overall: Redundant, expensive development

Why EDW?

- All decisions made for the entire company

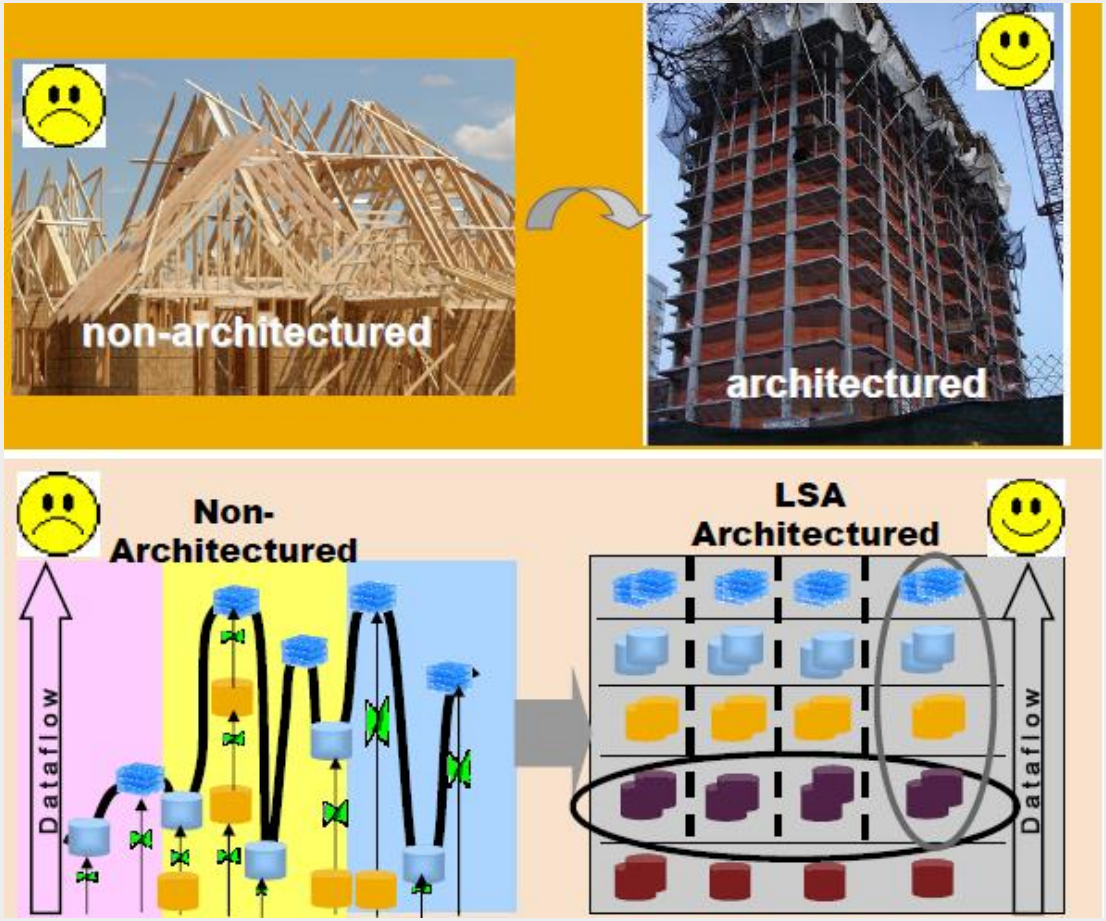
- To produce a valid and stable corporate Data Warehouse solution that satisfies all of the demands for integrated and consistently structured information.

- For this, it is necessary to adhere to generally accepted guidelines.

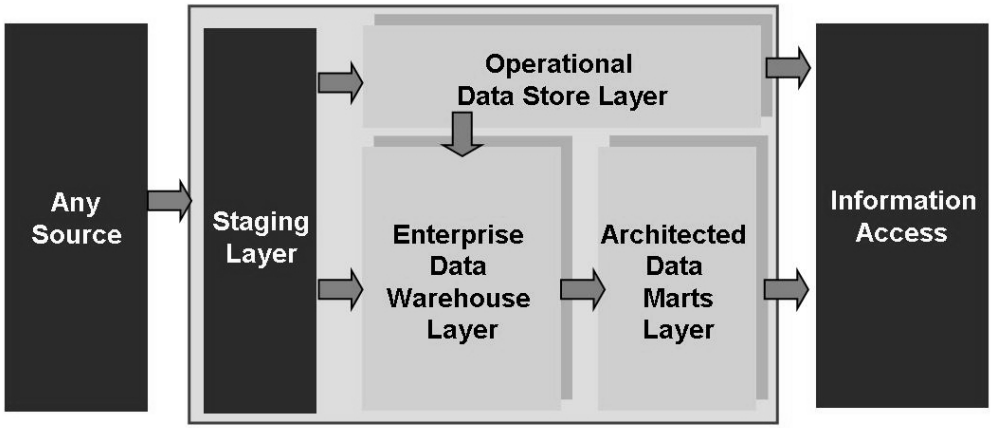
- The Enterprise Data Warehouse architecture reflects all of these decisions.

- The architecture is a "system design" decision that is valid and stable for a specified timeframe.

Non-Architectured Vs Architectured



The Layer Concept in Data Warehousing



Operational Data Store Layer

- Operational reporting
- Near real-time/volatile
- Granular
- Generally consisting of DataStore objects

Enterprise Data Warehouse Layer

- Not volatile
- Granular
- History
- Integrated
- Application-neutral
- Generally: DataStore objects

Architected Data Marts Layer

- Representing a function, a department or a business area
- Aggregated view
- Integrated
- Generally consisting of MultiProviders and InfoCubes

... to give users the correct information

Layers and BW Objects

Tactical/Strategic Reporting & Analytics
- Summarized
- InfoCubes, Aggregates, MultiProviders

Architected Data Marts

Operational Reporting & Analytics
- 'Standard reports', access-optimized
- Ad hoc (that is, flexibility)
- Detailed, less summarized
- DataStore objects, InfoCubes

Enterprise Data Warehouse

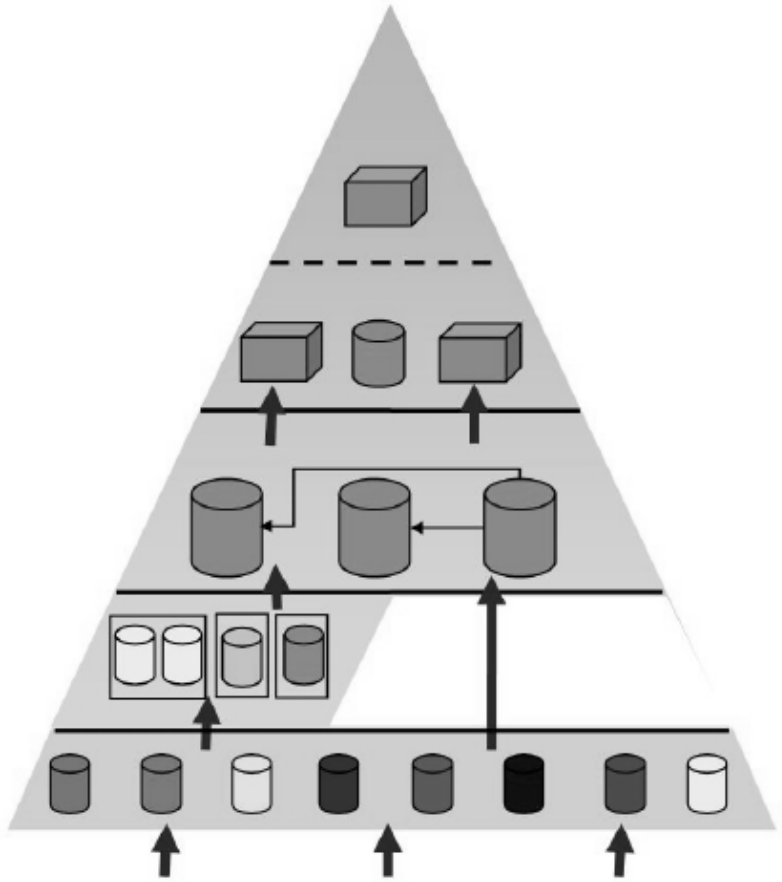
'single version of truth'
- **Corporate**, integrated, granular, complete data
- DataStore objects

Operational Data Store

Operational Reporting & Analytics
- Restricted integration, highly granular
- Short wait time, DataStore objects

Staging Area

Cleansing, Transformation, Quality
- Granular, PSA, DataStore objects



Comparison of different BI Layers

	Load frequency	Histor. back ground	Complete History	Primary Reporting Goal	Granularity of information	Owner	Overwriting/ changing loaded data	Archiv- ing
Data Marts (strategic)	daily, weekly, monthly	>= 2 years	N	Y	aggregated	user dept.	yes, for each project area	Y
Data Marts (operational)	daily, weekly, monthly	< 6 months	N	Y/(N)	easily aggregated/ granular	user dept.	yes, for each project area	Y
EDW	daily, weekly, monthly	several years	Y	N/(Y)	granular	entire company	no	Y
Oper. Data Store	almost real-time – daily	< 6 months	N	Y	granular	user dept.	yes, for each project area	Y