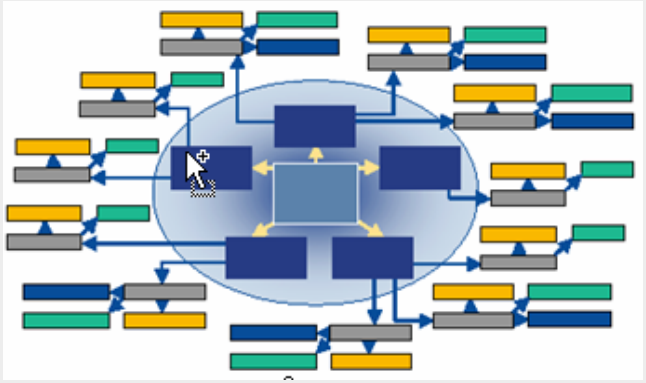
SAP BW

Lesson 02 :- Modeling Part 1

Capgemini

Data Modeling Objects in Data Warehouse



Purpose

- Data modeling is the “backbone” of the BI system.

- It enables staging of information from large amount of operative and historical data and permits multi-dimensional analysis according to various business perspectives.

- Thus the main purpose of data modeling is to structure and organize all the necessary data for business users for the purpose of analysis.

Use

- Data Modeling serves as the tool for managing the middle phase of data warehousing i.e. it helps managing the staging and transforming phase of data warehousing life cycle.

- It's main use is to store the summarized data physically in order to facilitate the BI reporting for the organization.

- It helps shaping and transforming the data to make it suitable for reporting.

- It provides more flexibility in terms of data transformation as compared to the source system due to availability of various methods of data transformation.

Challenges

- Designing a complete and efficient data model that satisfies the business need is the most important factor to the success of a BI implementation.

- Identification of relevant business entities and their relationships is critical while designing a Data model.

- Accurate mapping of the business entities with respect to Business content objects in BI.

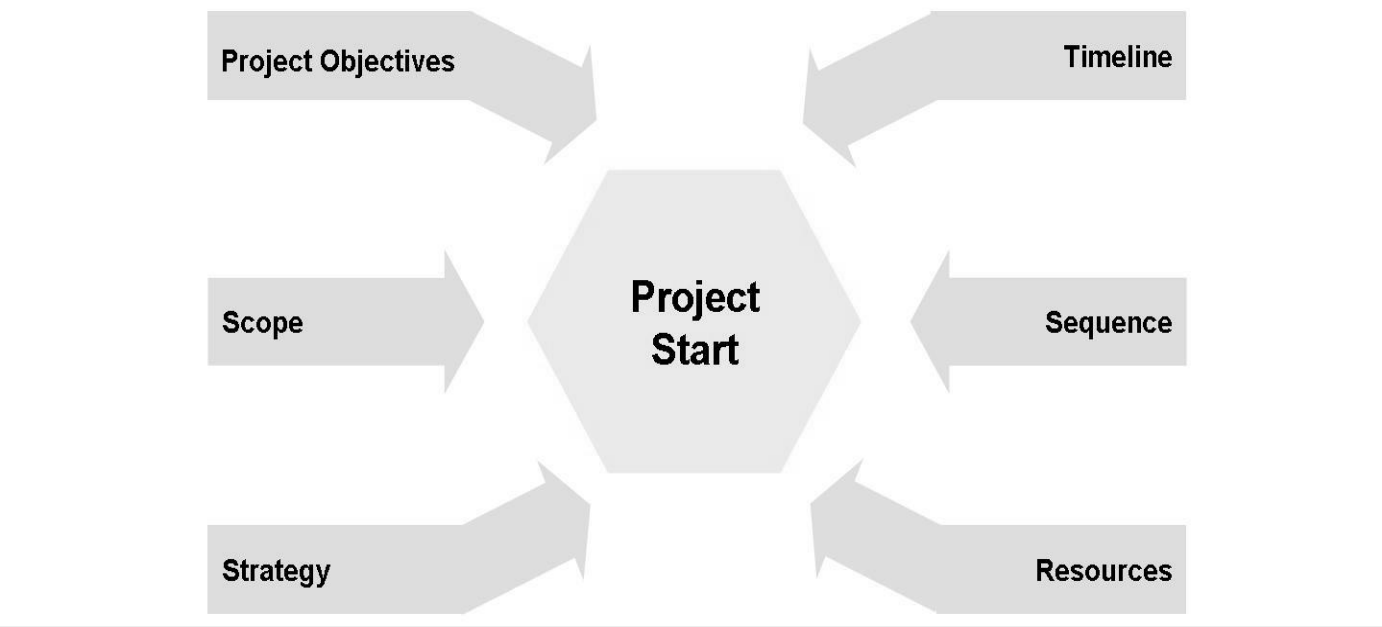
- Designing a comprehensive data model to support requisite reporting KPIs.

Procedure and Phases of Project

Modeling Procedure

- Before you take some time to think about the BI-specific procedure, first draft a plan for the general procedure for your project.
- Which aspects must you consider for successful project implementation?

- Factors for Success



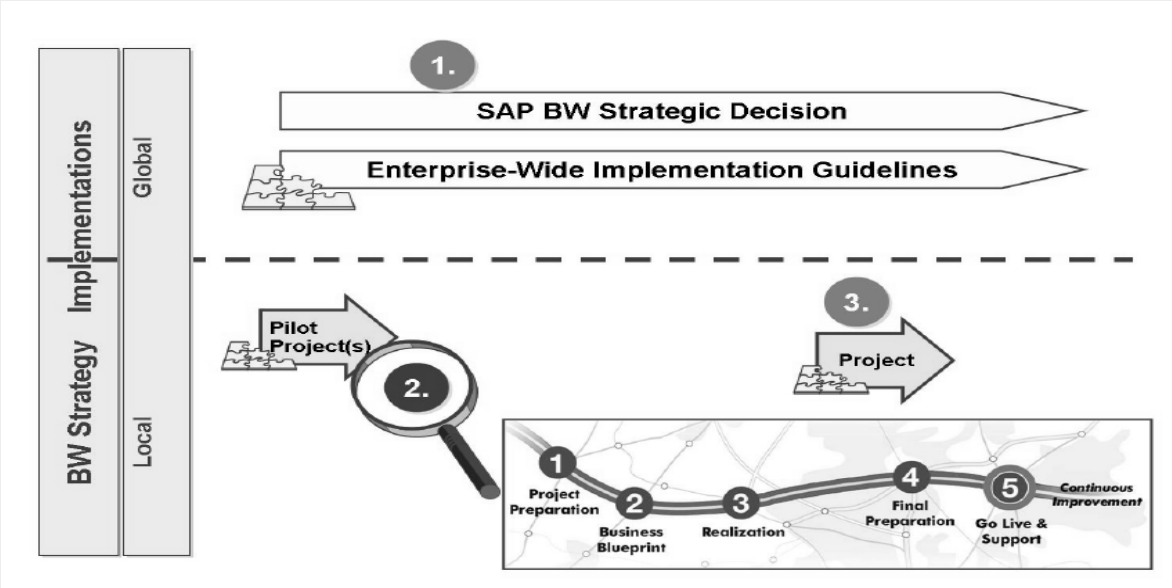
Modeling Procedure (Contd…)

- Generally, the process of modeling a Data Warehouse system takes place in three steps:

- Running a Requirement Analysis
- Creating a Logical Data Model
- Creating a BW Data Model

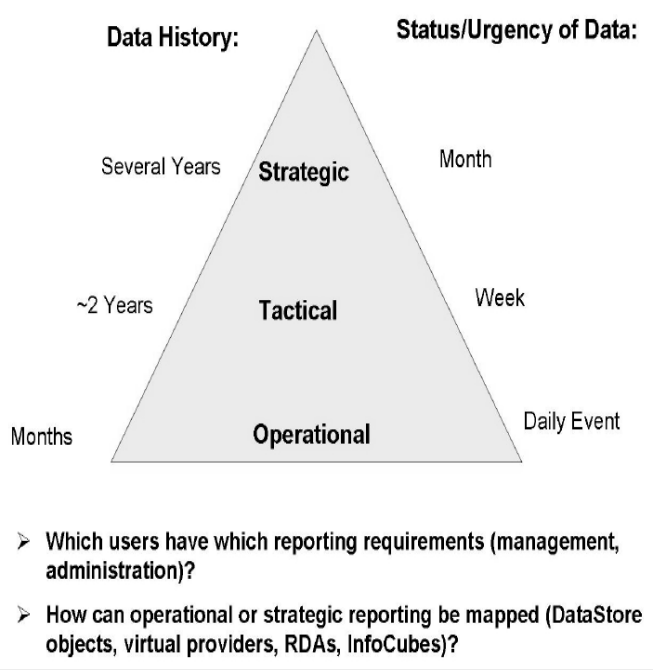
Phases of Project

- Project Preparation
- Business Blueprint
- Realization
- Final Preparation
- Go-Live and Support

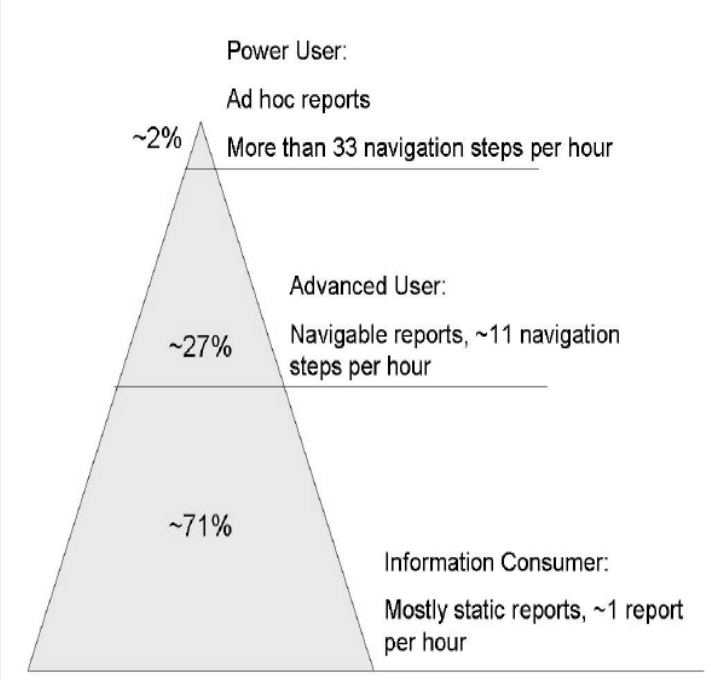


Requirement Analysis

- The relevant processes in the source systems need to be analyzed and the necessary information has to be compiled.
- The user department, users and the BW project team need to work very closely together.



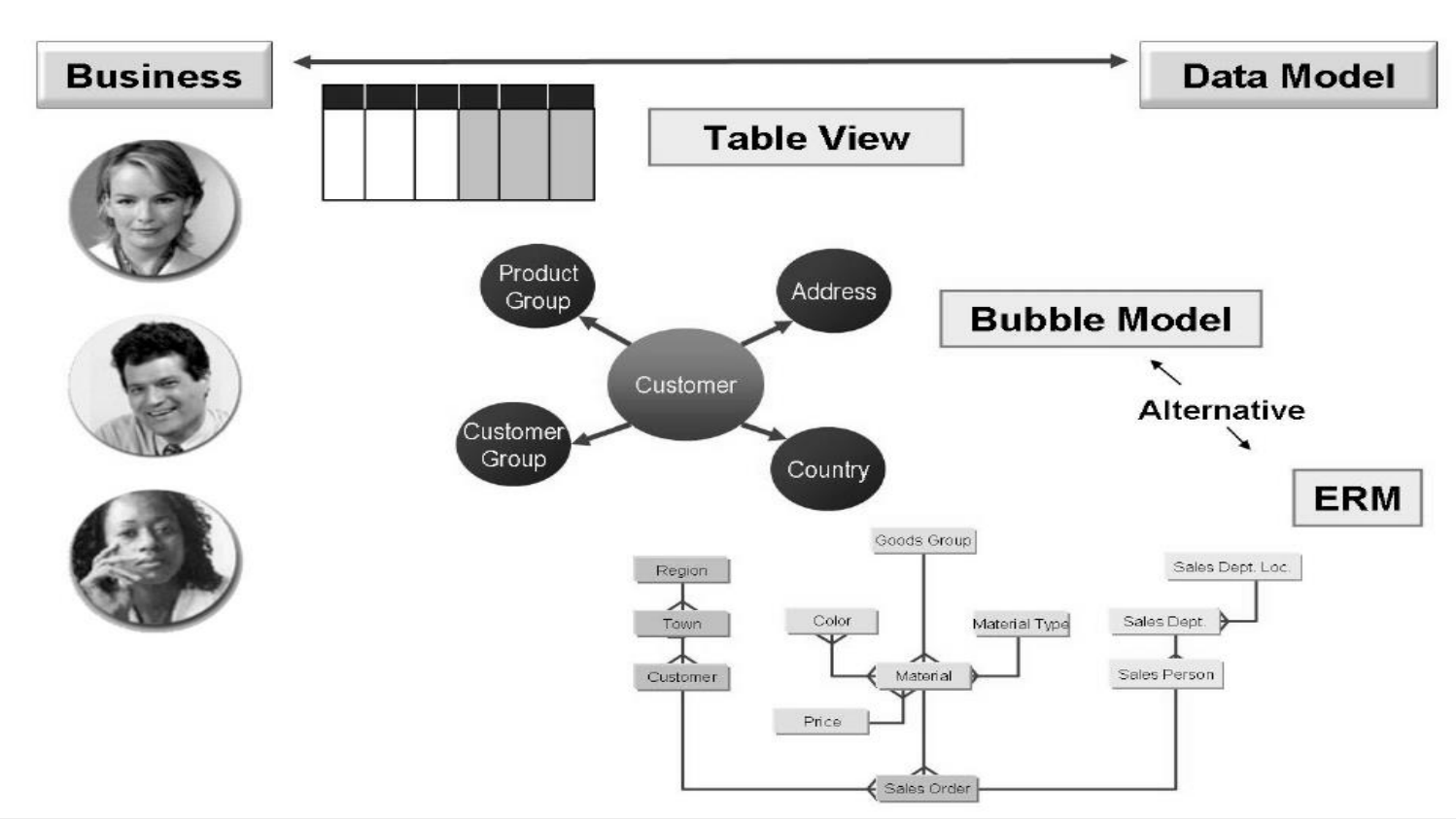
Analysis Levels



User Groupings

Logical Data Model

➢The requirement analysis is transformed into a **Logical data Model (Bubble Model).**



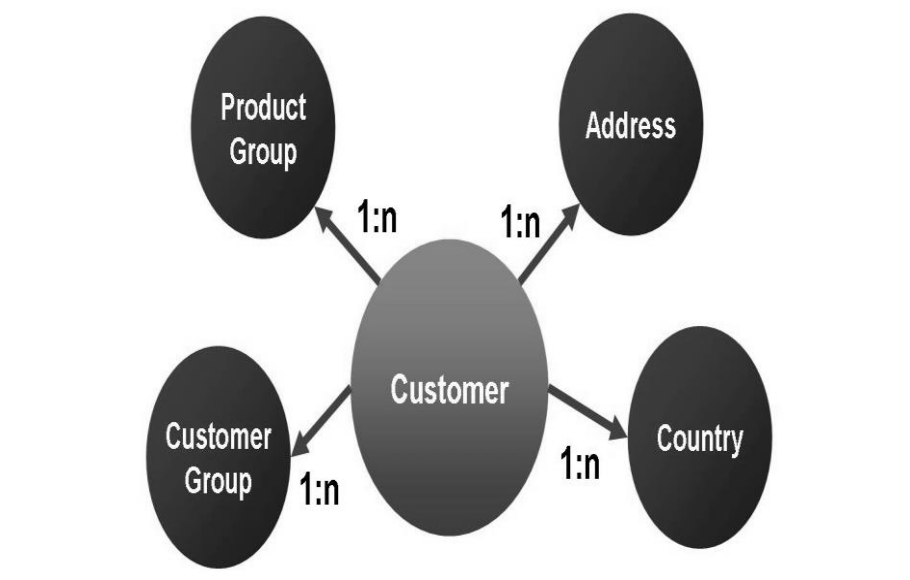
Steps to Create Logical Data Model

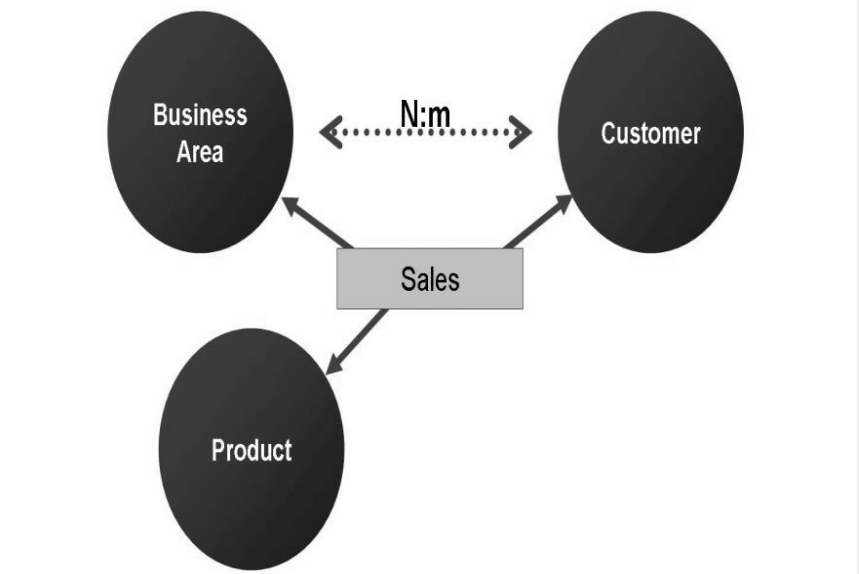
➢**Step1 :** Derive KPIs / Business Drivers: Describe your key performance indicators (key figures) down to the lowest level of detail. Which basic key figures are needed?

➢**Step2 :** Define Business Subjects: Find your main business subjects such as customer, product, organization, and describe them according to their important properties.

➢**Step3 :** Assignment of Business Subjects to Key Figures: The business subjects have an n:m relationship (for example, one customer can buy several products or one product can be bought by several customers). Products are sold in several business units.

Steps to Create Logical Data Model

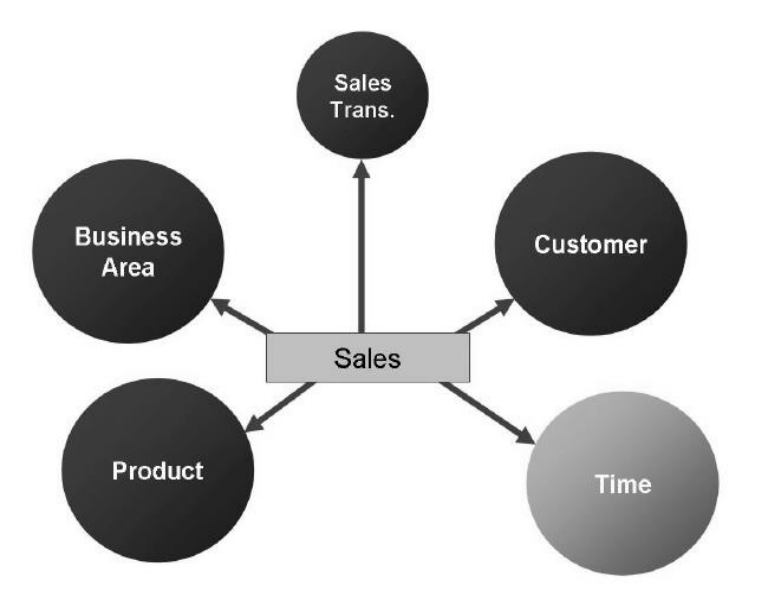


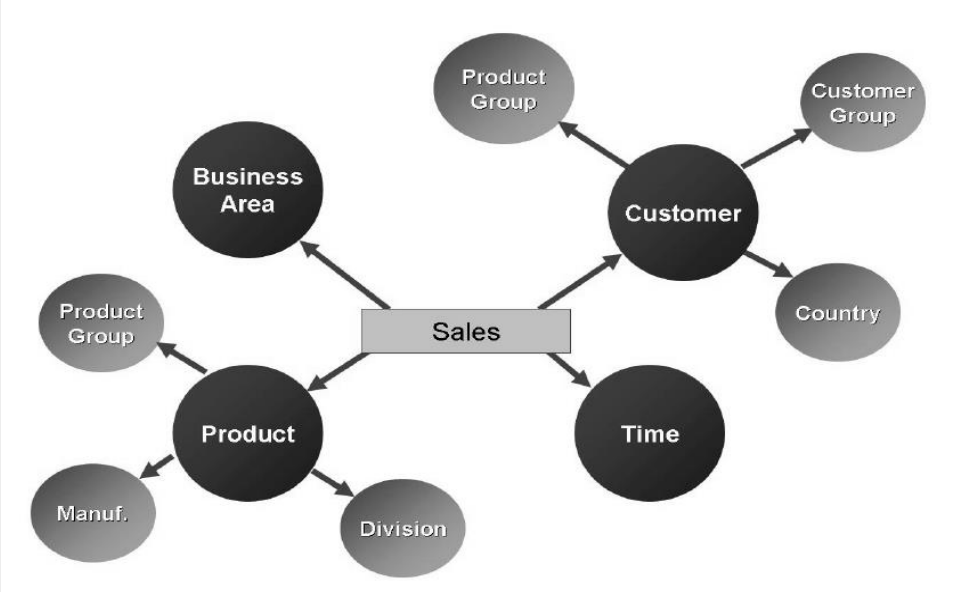


Steps (Contd..)

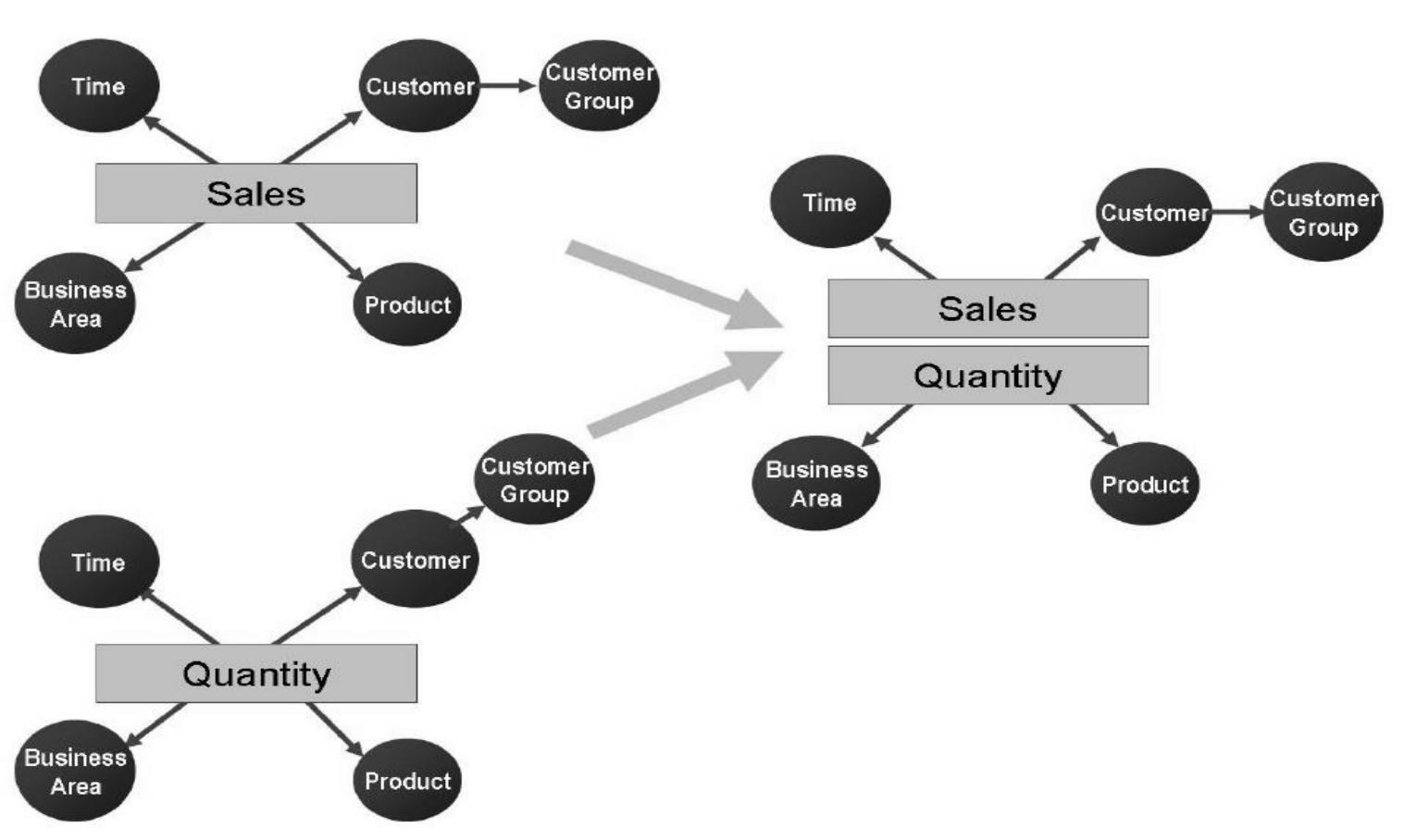
- **Time View:** The time plays an extremely important role in influencing the granularity of the data

- **Complete View:** The business subjects that belong together are grouped around the key figure.



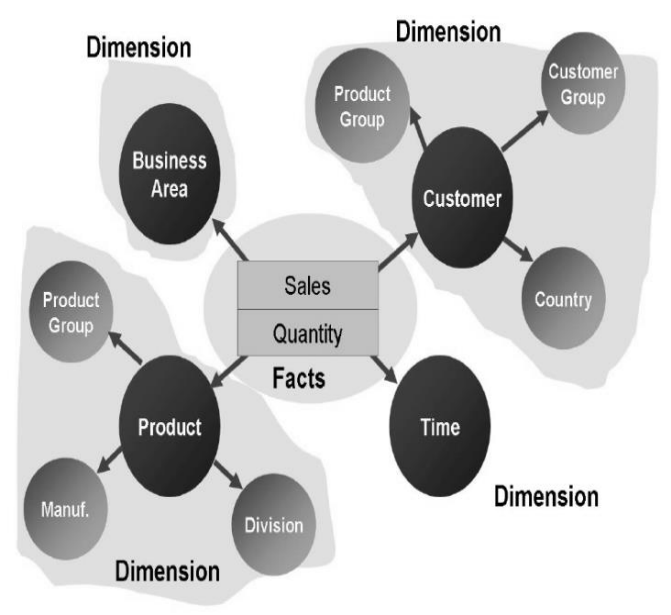


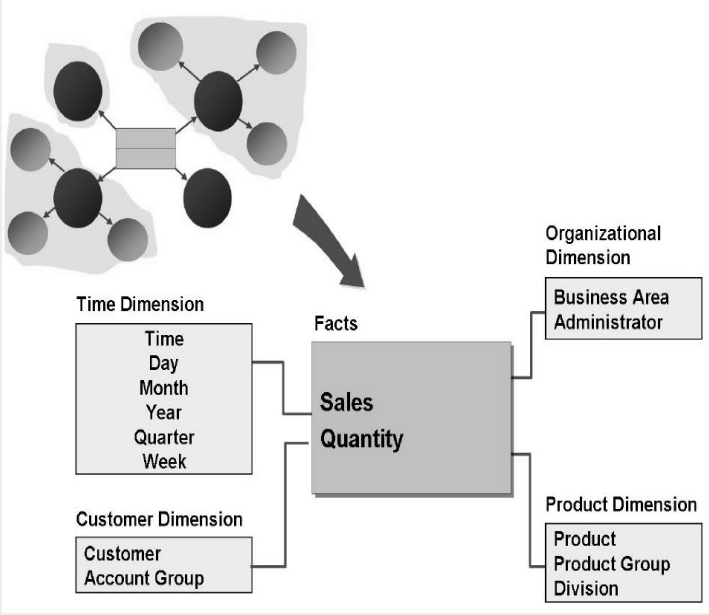
Logical Data Model



The BW Data Model

- From Bubble Model to Star Schema
- The key figure structures are the facts in the center of the bubble model.
- The dimensions are the business subjects with their attributes. Note that these attributes have a 1:n relationship with their "main object".

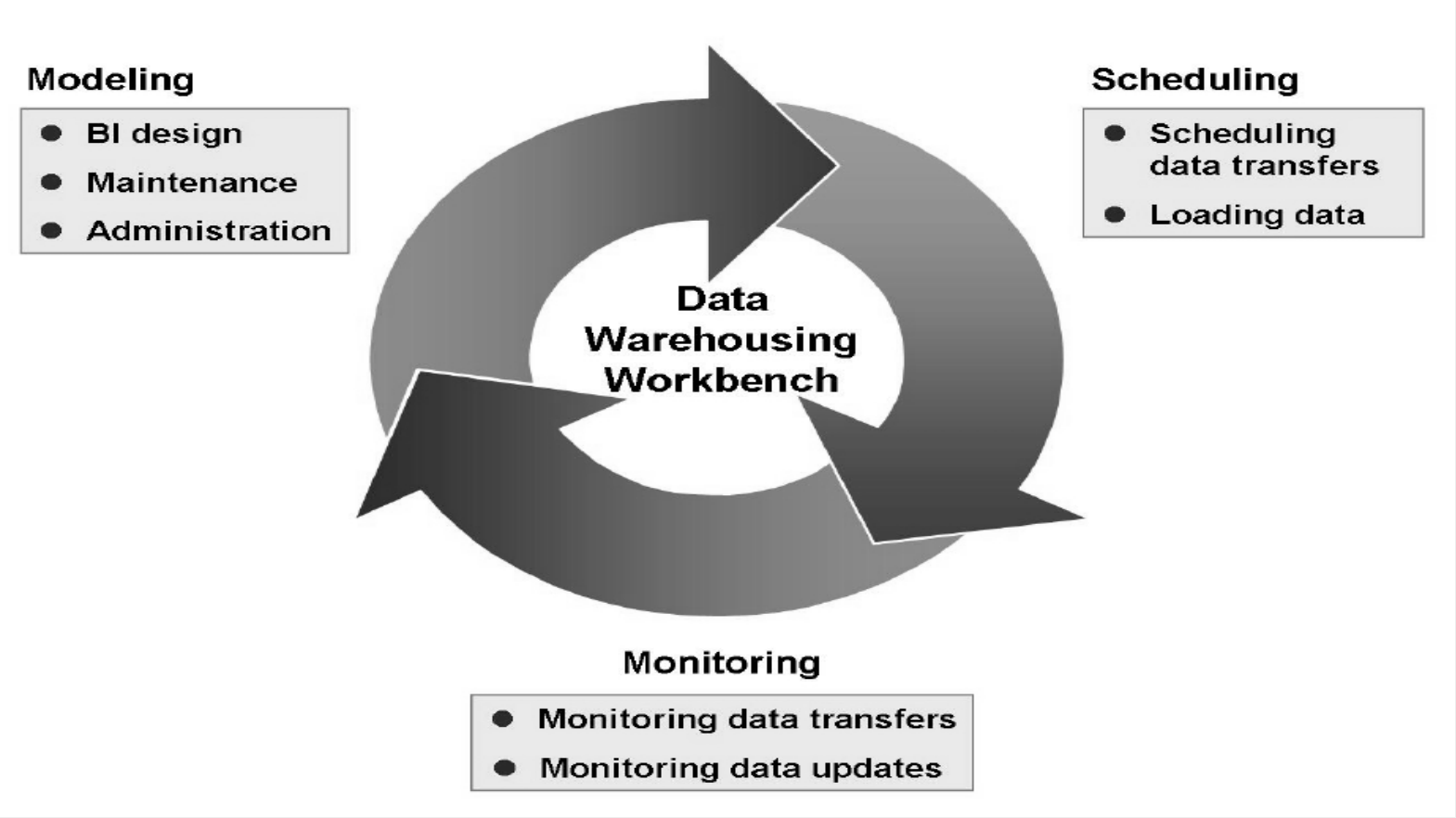




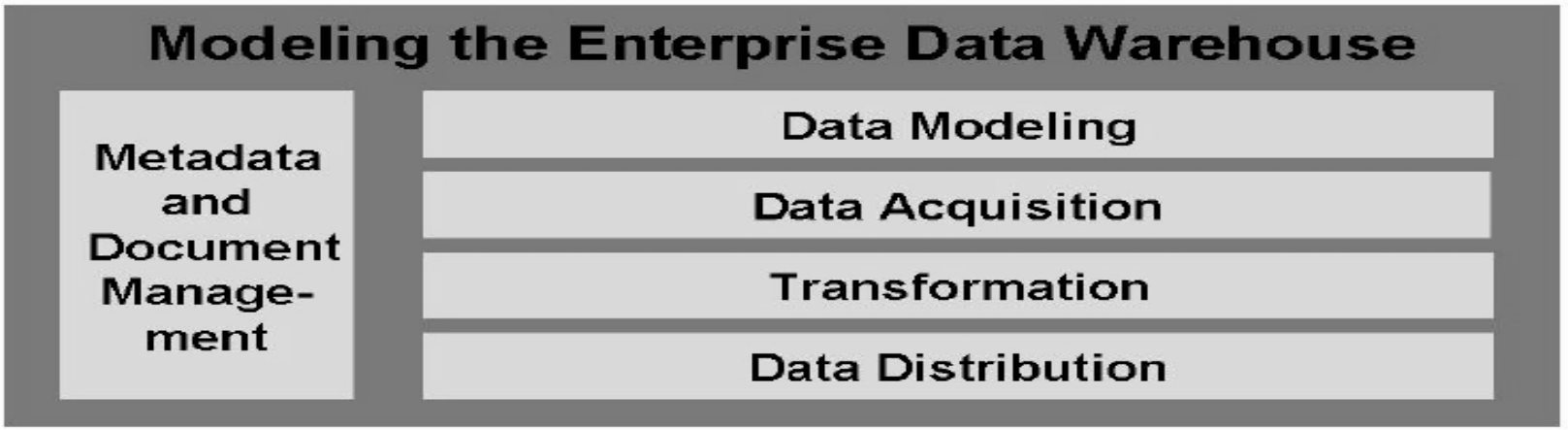
Modeling Overview
Data Warehouse Workbench

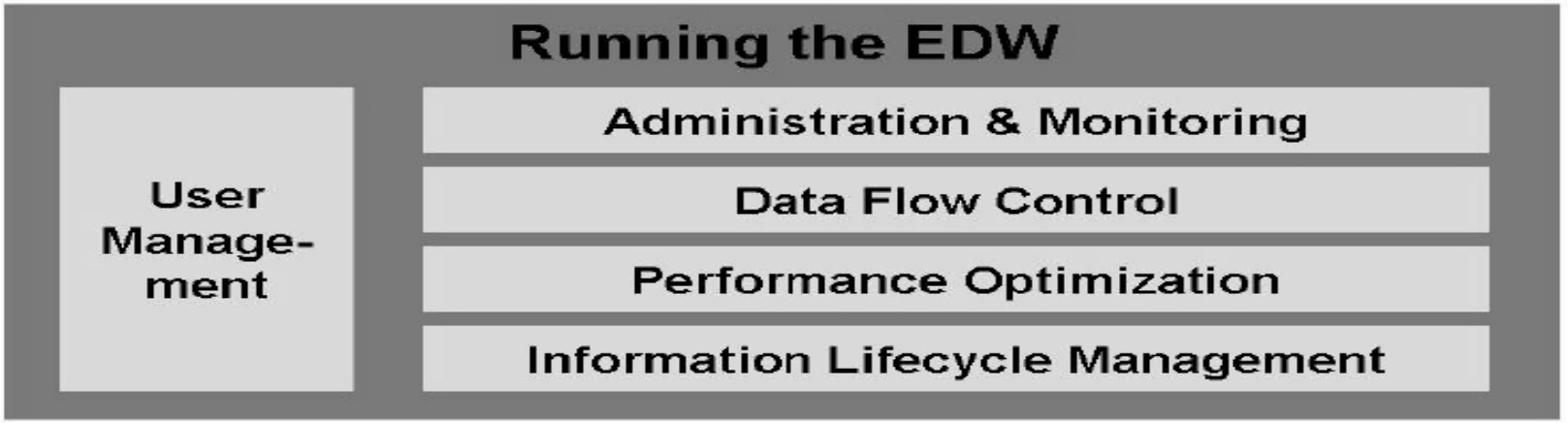
Data Warehousing Workbench

- **Data Warehousing Workbench** - Transaction Code RSA1
- The **DWWB** is the central tool for the BI Technical Professional

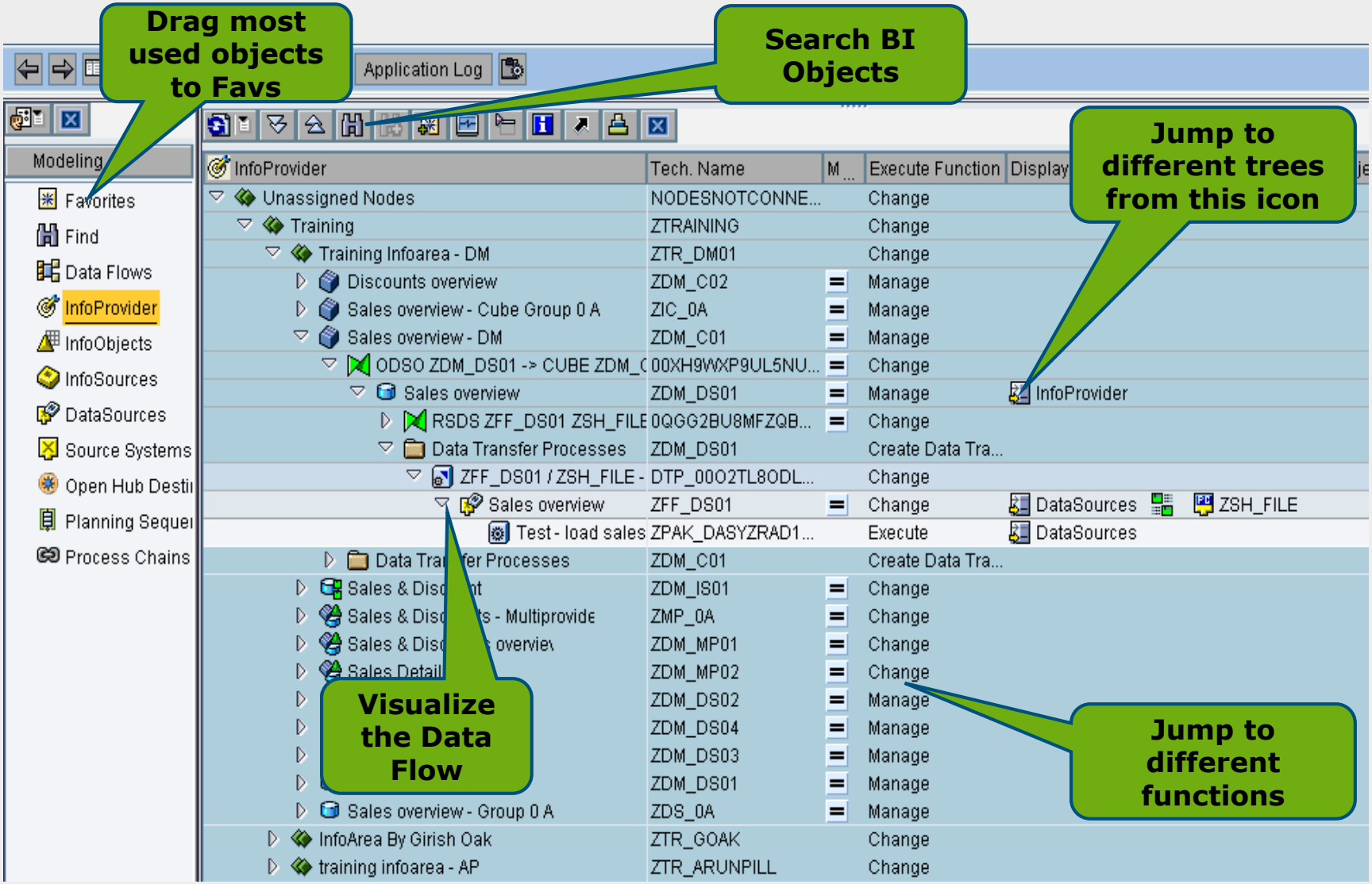


Modeling (Design)Vs. Administration(Day-to-Day Tasks)





Modeling


Drag most used objects to Favs
Search BI Objects
Jump to different trees from this icon
Visualize the Data Flow
Jump to different functions
Application Log
Modeling
Favorites
Find
Data Flows
InfoProvider
InfoObjects
InfoSources
DataSources
Source Systems
Open Hub Desti
Planning Sequer
Process Chains
InfoProvider
Tech. Name
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Execute Function
Display
Unassigned Nodes
NODESNOTCONNE...
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00XH9WXP9UL5NU...
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Sales overview
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InfoProvider
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Data Transfer Processes
ZDM_DS01
Create Data Tra...
ZFF_DS01 / ZSH_FILE -
DTP_00O2TL8ODL...
Change
Sales overview
ZFF_DS01
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DataSources
ZSH_FILE
Test - load sales
ZPAK_DASYZRAD1...
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DataSources
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ZDM_C01
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Change
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Sales overview - Group 0 A
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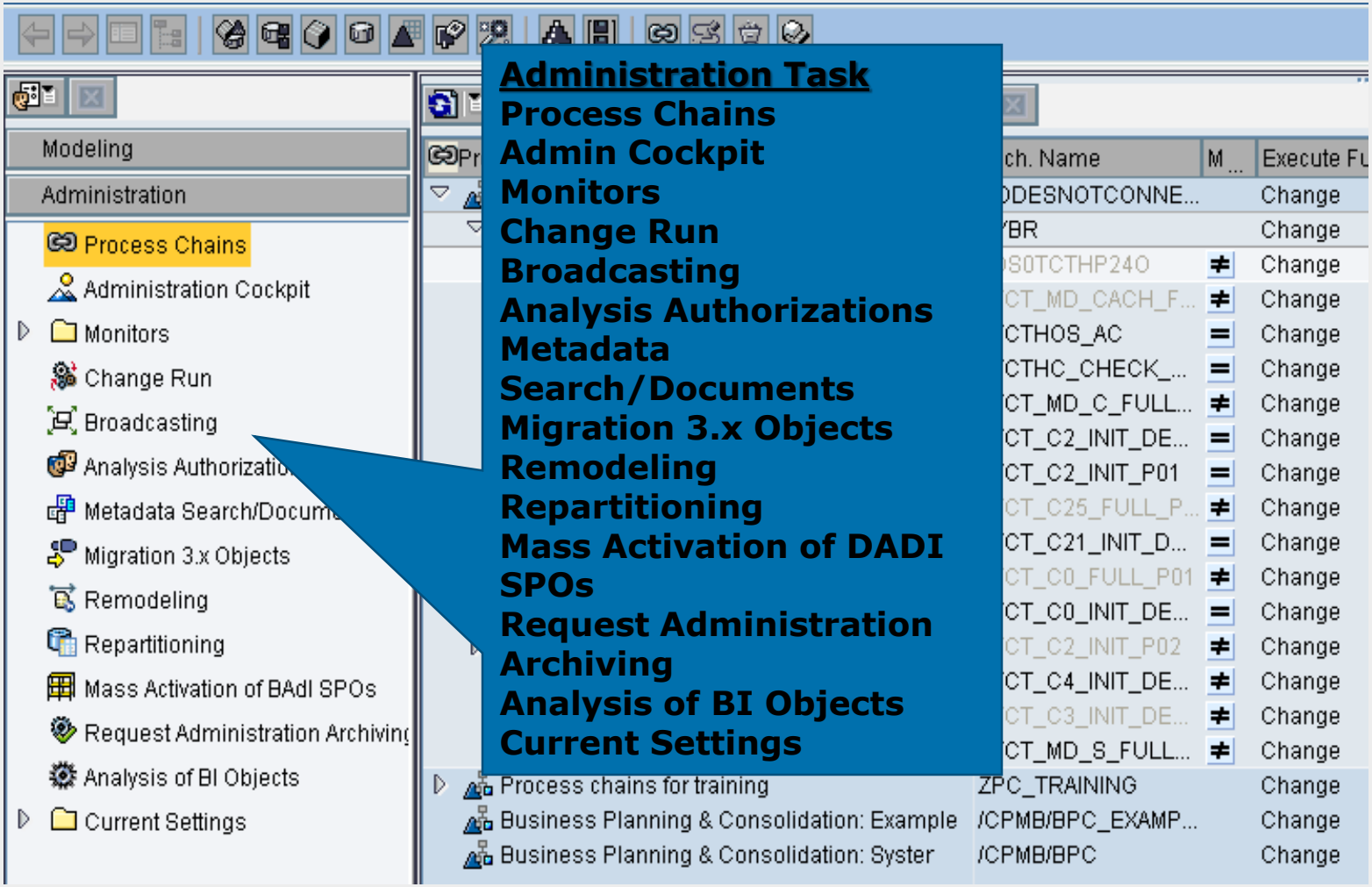
Administration



Info Objects

InfoObjects

➢Business evaluation objects are known in BI as InfoObjects. They are the basic information providers of BI and the smallest information units in BI.

➢They structure the information needed to create InfoCubes/DSO Objects.

➢InfoObject types:

➢**Characteristics**

- Basic
- Time
- Technical

➢**Key figures**

➢As components of the Metadata Repository (the storage area for all BI objects), InfoObjects contain technical and business analyst information for master and transaction data in BI.

Types of InfoObjects

➢**Characteristics InfoObjects** are business reference objects which are used to analyze key figures such as company code, material, product, customer group.

➢**Time characteristics** are characteristics such as date, fiscal year which are time indicators.

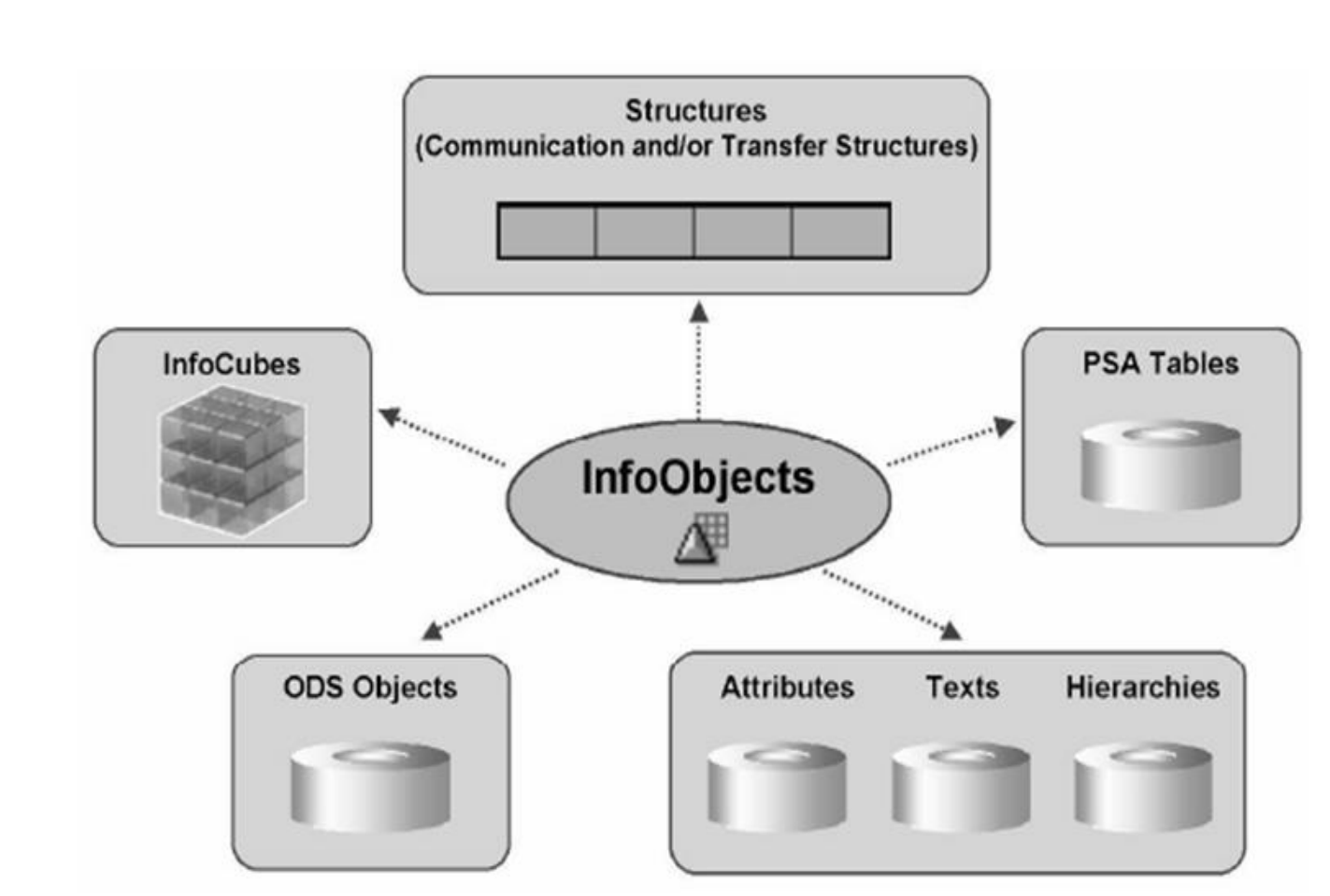
➢**Units Characteristic** are required so that the values for the key figures have meanings. Key figures of type amount are always assigned a currency key and key figures of type quantity also receive a unit of measurement.

➢

➢**Technical characteristics** are used for administrative purposes only within BI. An example of a technical characteristic is the request number in the InfoCube. This is generated when you load a request as an ID and helps locate the request at a later date.

➢**Key Figures InfoObjects** provide values to be evaluated such as quantity, amount, or number of items.

Use of Info-Objects



Master Data/Texts

Screenshot: 'Master Data/Texts'

☑ With master data?

View of Mast. Data Tbl.	/BIC/MCOSTC##
Master Data Table	/BIC/PCOSTC##
Mast. Data Tbl. TDep.	/BIC/QCOSTC##
TDep. Attr. SID Tble	/BIC/YCOSTC##

Screenshot: 'Attributes' Tab Page

Attribute		Type	Time..
0COMP_CODE		NAV	☑
0BUS_AREA		NAV	☑
0EVCURRCOST		DIS	☑
0PROFIT_CTR		DIS	☐
0ENTRYDATE		DIS	☐

Structure: /BIC/P<...>

/BIC/<...>	OBJVERS	CHANGED	<Attribute>[1]	<Attribute>[2]	<Attribute>[3]	...
	A					

Key

Structure: /BIC/Q<...>

{...}	/BIC/<...>	OBJVERS	DATETO	DATEFROM	CHANGED	<Attribute>[1]	...
		A	31.12.9999	01.01.1000			

Key

Master Data/Attributes

- Attributes are Info Objects that are logically subordinate to a characteristic.

- Attributes are two types: Display Attributes and Navigational Attributes

- Difference between Navigational Attribute and Display Attribute?

The basic difference between the two is that navigational attribute can be used to drilldown in a Bex report whereas the display attribute cannot be used. A Navigational attribute would function more or less like a characteristic within a cube.

To Enable these feature as Navigational Attribute, the attribute needs to be made navigational in the cube apart from master data info object.

Hierarchies

- Hierarchies are used in analysis to describe alternative views of the data. They serve a grouping function

- **Version-Dependent:** Characteristic hierarchies can be used in different hierarchy versions.

- **Time Dependent:** there are different versions for this hierarchy that are valid for a specific time intervals only. The system automatically chooses the valid version based on settings in the query.

Hierarchy Version for *Main District* Characteristic

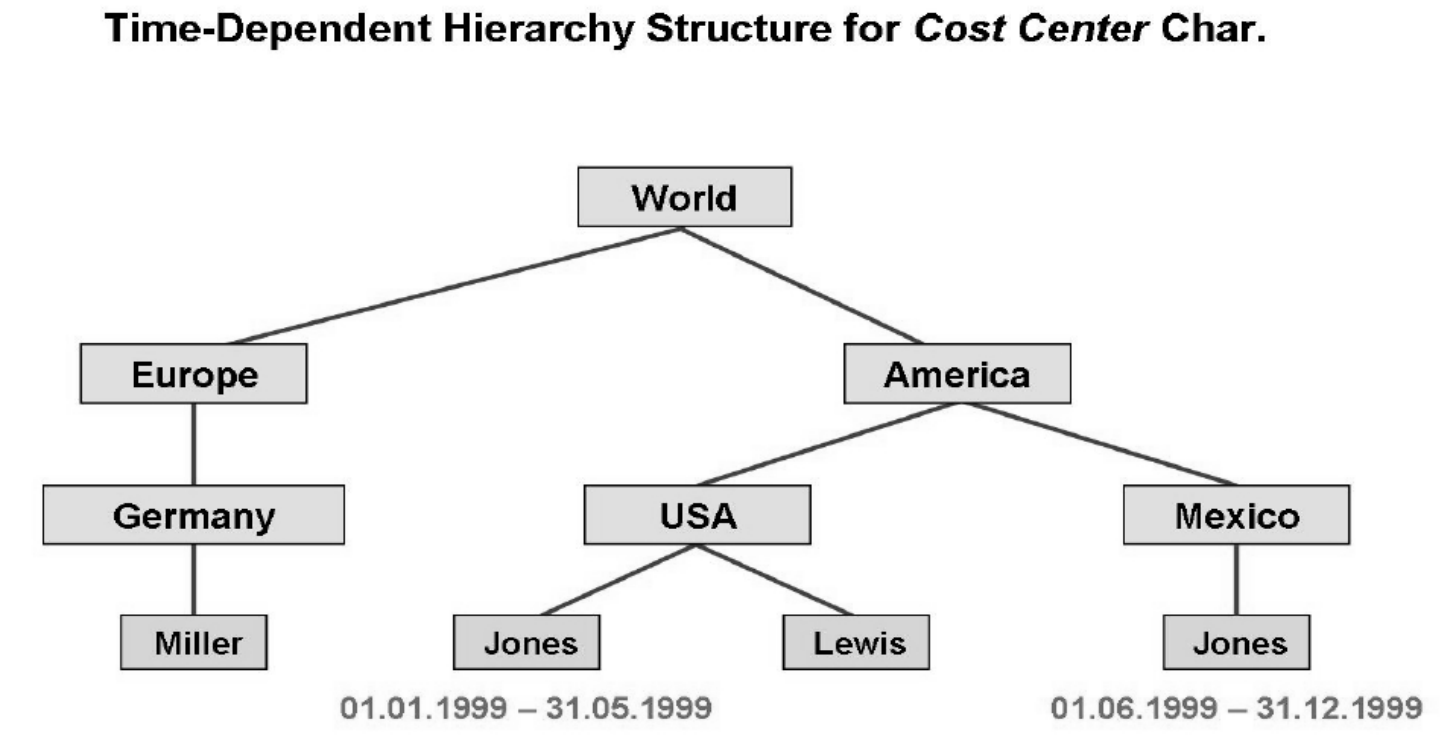
Hierarchy Version PLAN	Hierarchy Version ACTUAL
Main District NORTH	*Main District NORTH*
District 1	*District 2*
District 2	
Main District SOUTH	*Main District SOUTH*
District 3	*District 1*
District 4	*District 3*
	District 4

Time-Dependent Complete Hierarchy for *Main District* Char.

Hierarchy 01.01.1999 – 31.05.1999	Hierarchy 01.06.1999 – 31.12.1999
Main District NORTH	*Main District NORTH*
District 1	*District 2*
District 2	
Main District SOUTH	*Main District SOUTH*
District 3	*District 1*
District 4	*District 3*
	District 4

Hierarchies.. (Contd..)

➢**Time Dependent Hierarchy Structure**: You could determine that the hierarchy structure (a hierarchy node) is to be time-dependent.



Compounding

- It allows to compound characteristic to other InfoObjects.

- For example,
- If storage location A for plant B is not the same as storage location A for plant C, you can only evaluate the characteristic Storage Location in connection with Plant. In this case, compound characteristic Storage Location to Plant, so that the characteristic is unique.

Reference Characteristics

- If an InfoObject has a reference InfoObject, it has its technical properties:

- 1.For **characteristics** these are the data type and length as well as the master data (attributes, texts and hierarchies). The characteristic itself also has the operational semantics.

- 2.For **key figures** these are the key figure type, data type and the definition of the currency and unit of measure. The referencing key figure can have another aggregation.

Key Figures

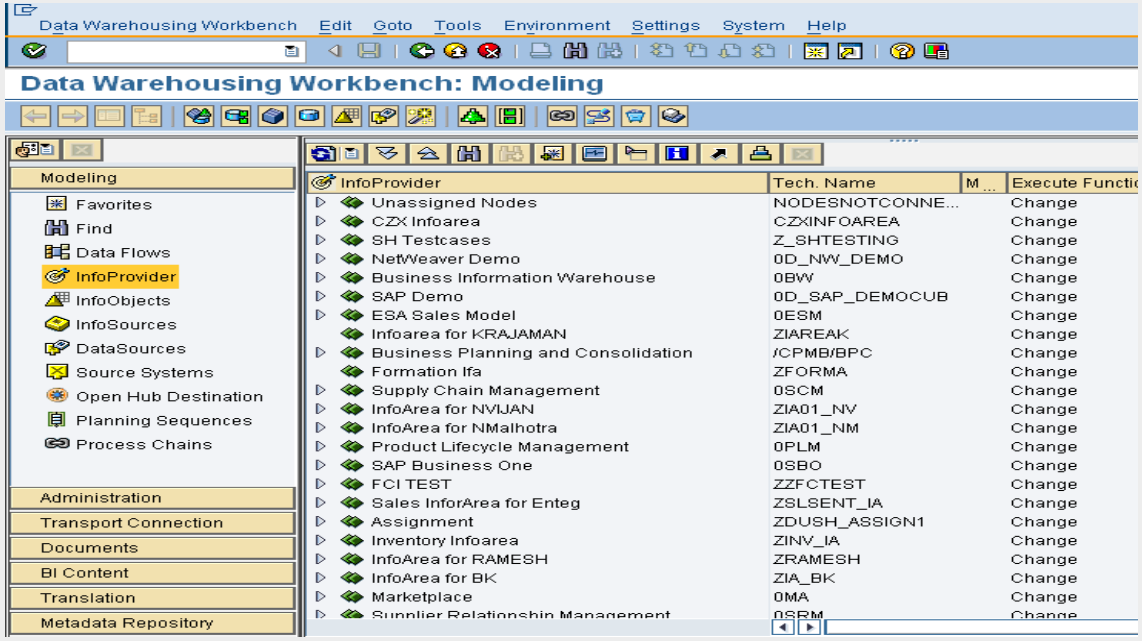
➢You can define Key Figures InfoObjects and change settings on the following tab pages on the Maintenance menu:

- Type/unit
- Aggregation
- Additional Properties

InfoArea

- InfoArea is used to group various Info Object Catalogues.

- Various areas are displayed at the left in the Data Warehousing Workbench



InfoObject Catalog

➢An InfoObject catalog is a collection of InfoObjects grouped according to application-specific criteria.

➢You can group Info Objects together in InfoObject Catalogs to provide both a better overview to them and to arrange them logically.

➢Types of **InfoObject catalog**

- **Characteristic:** This is the collection of Characteristics InfoObjects
- **Key figure**: This is the collection of Key figures InfoObjects

➢Transactions RSD1 and RSD5 allow you to create InfoObjects (characteristics, key figures) without them being assigned to an InfoObject catalog (thus creating free InfoObjects).

InfoObject Catalog