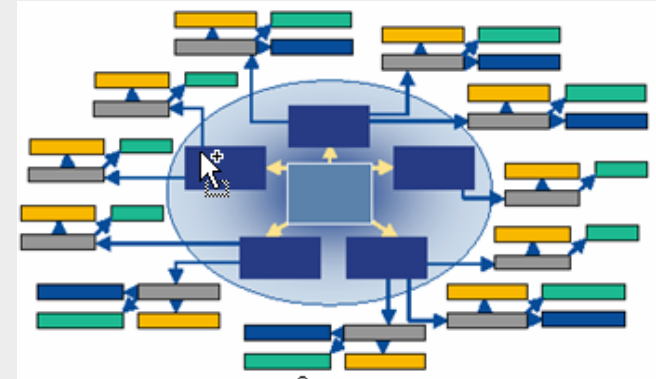


SAP BW

Lesson 02 :- Modeling Part 1

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.



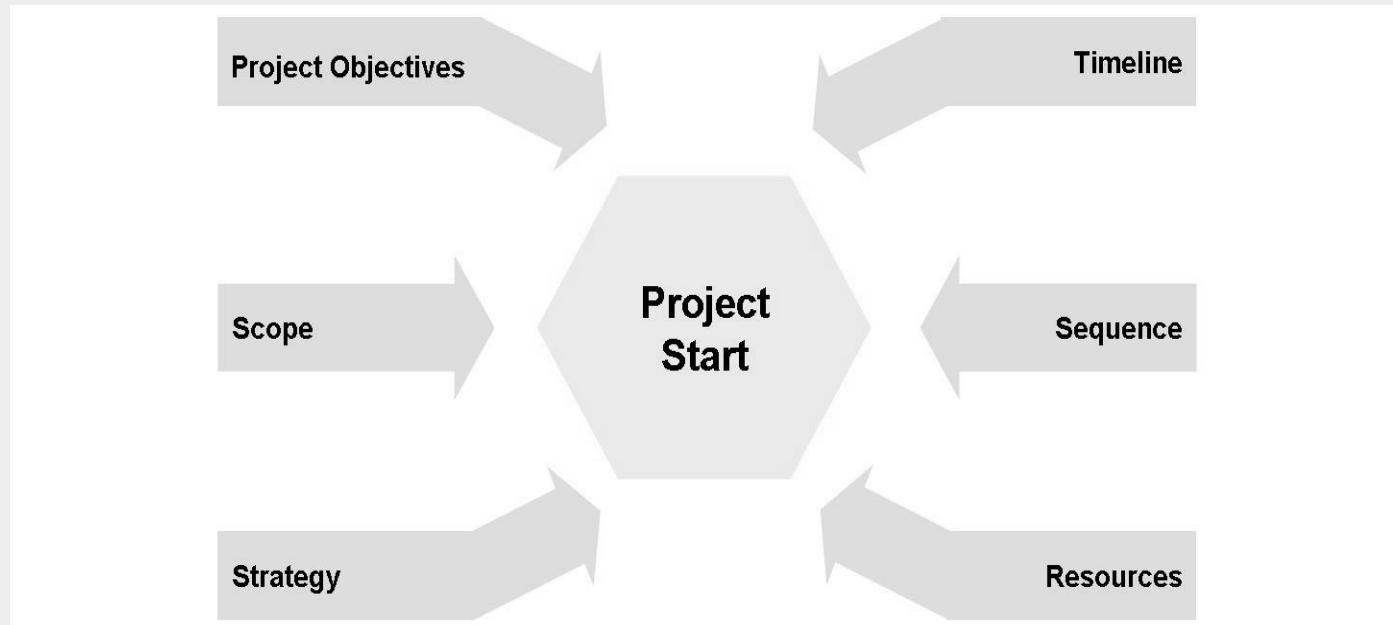
Procedure and Phases of Project



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





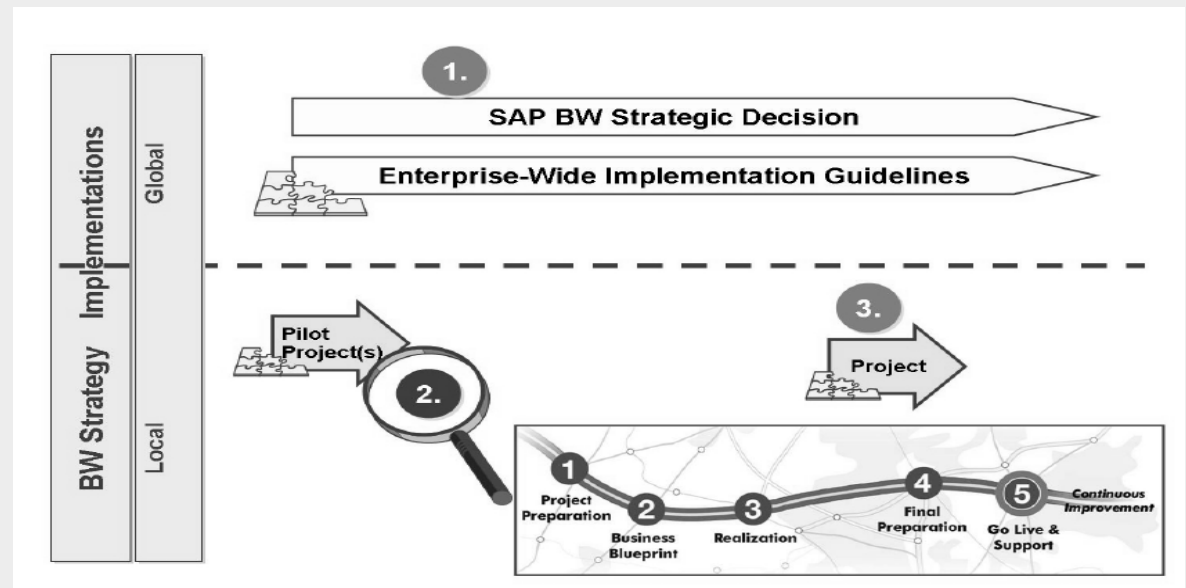
Modeling Procedure (Contd...)

- 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

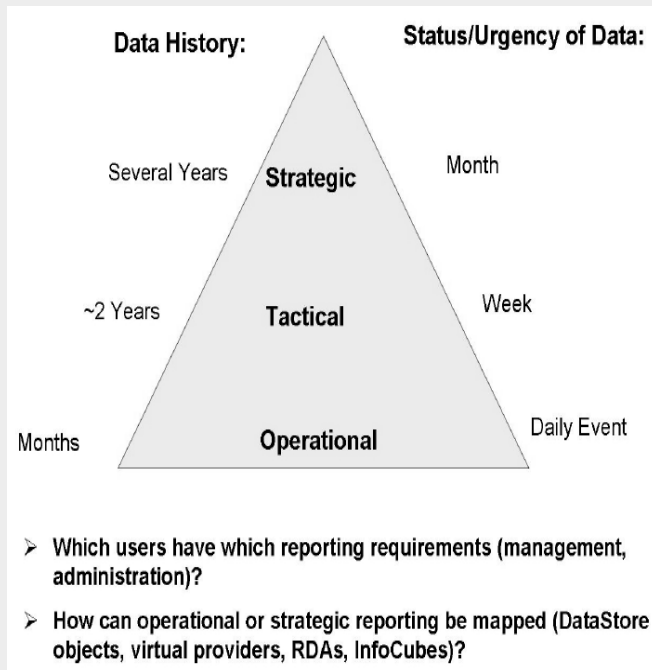
- Project Preparation
- Business Blueprint
- Realization
- Final Preparation
- Go-Live and Support



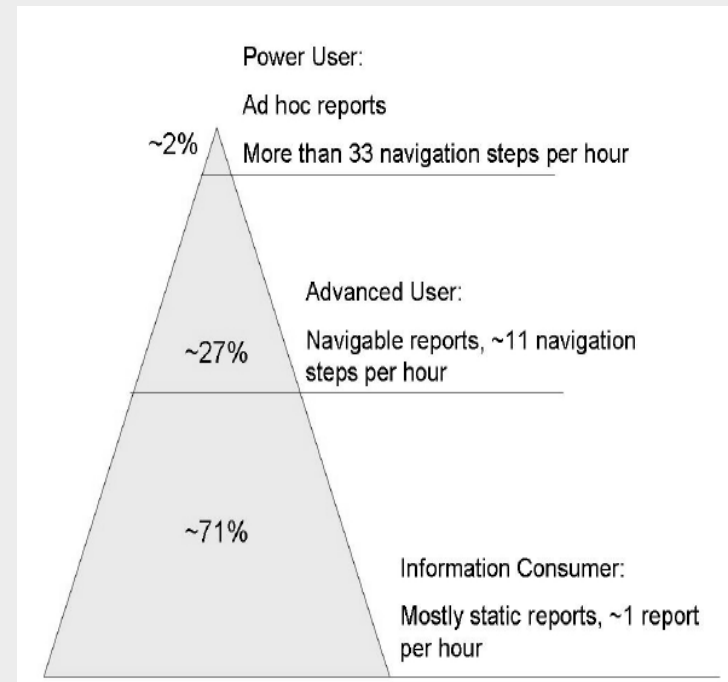


Requirement Analysis

- 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

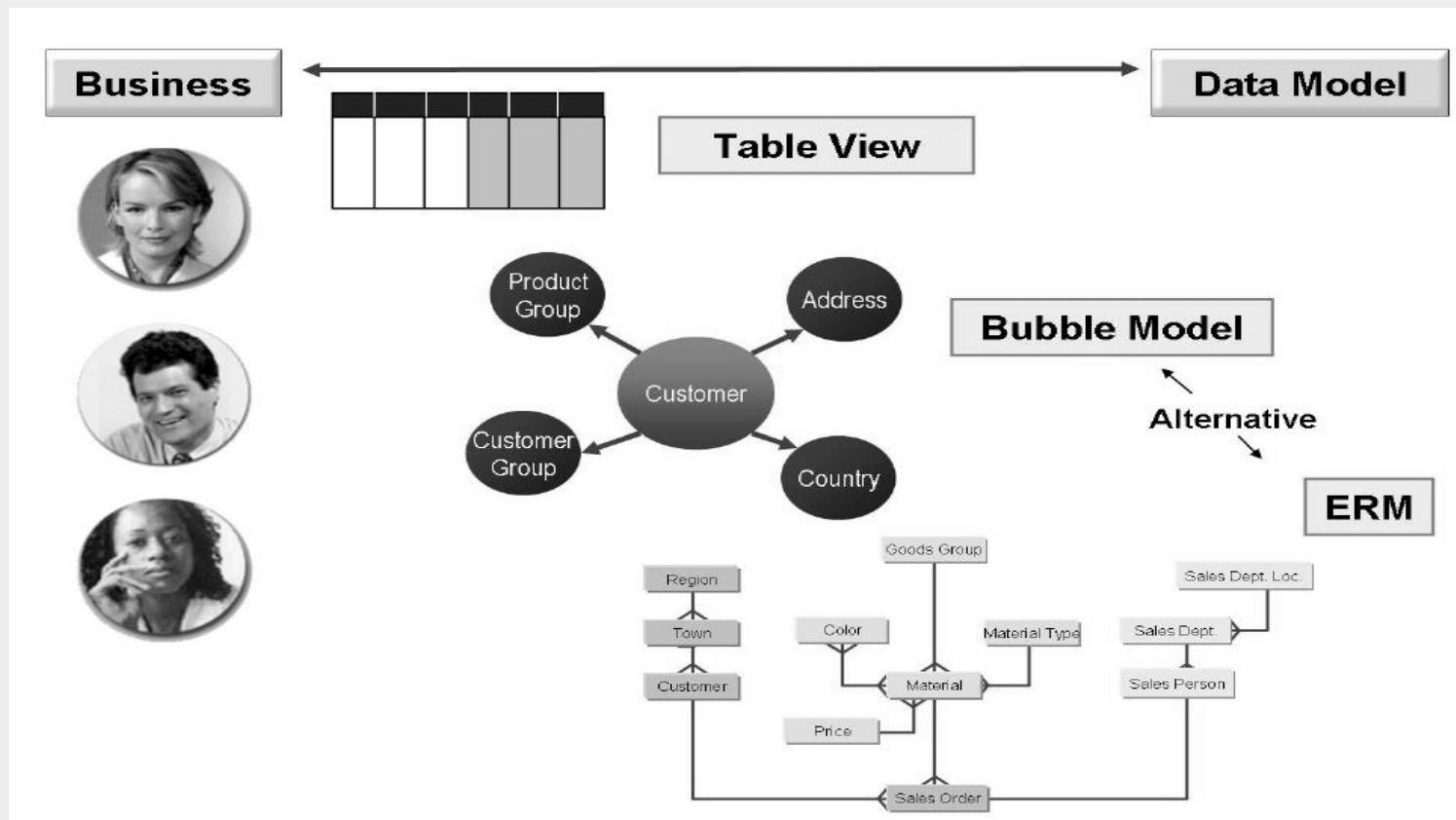


User Groupings

Logical Data Model



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

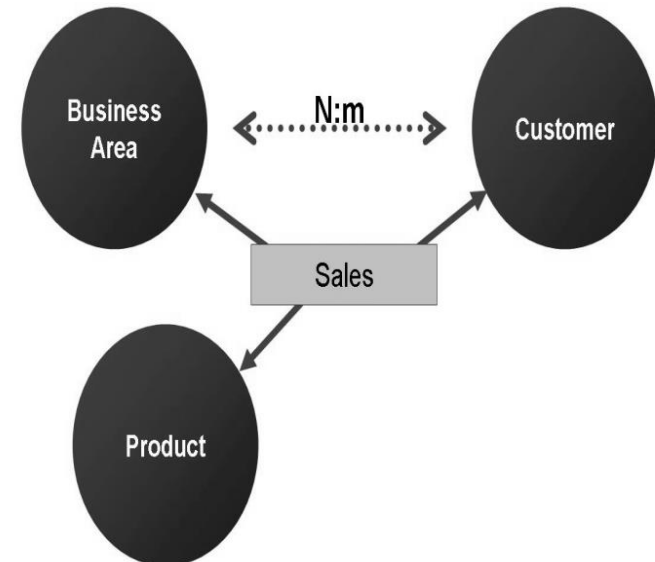
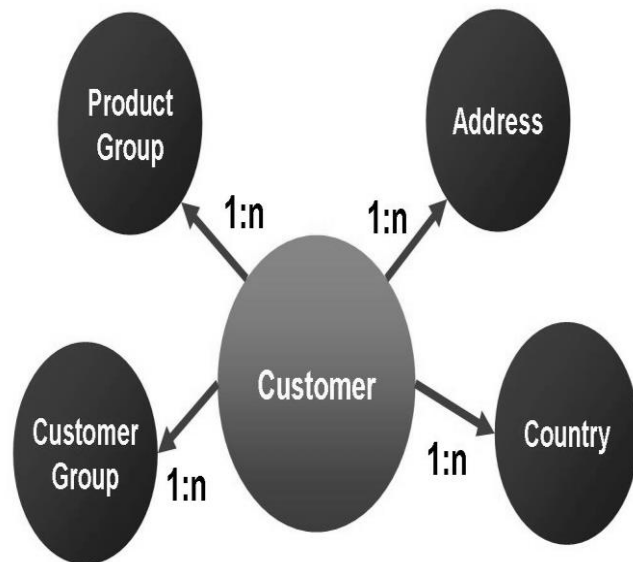




Steps to Create Logical Data Model

- **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.

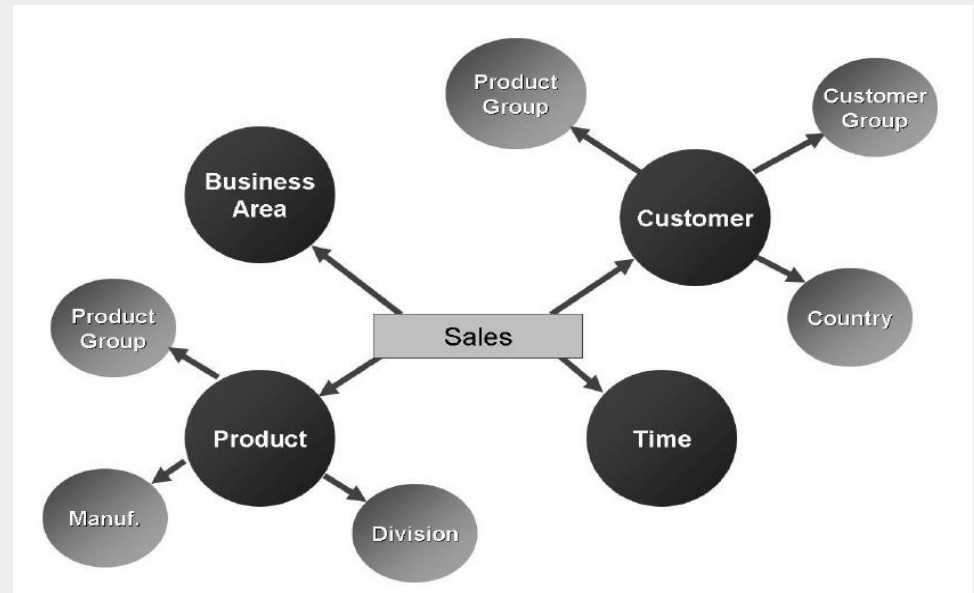
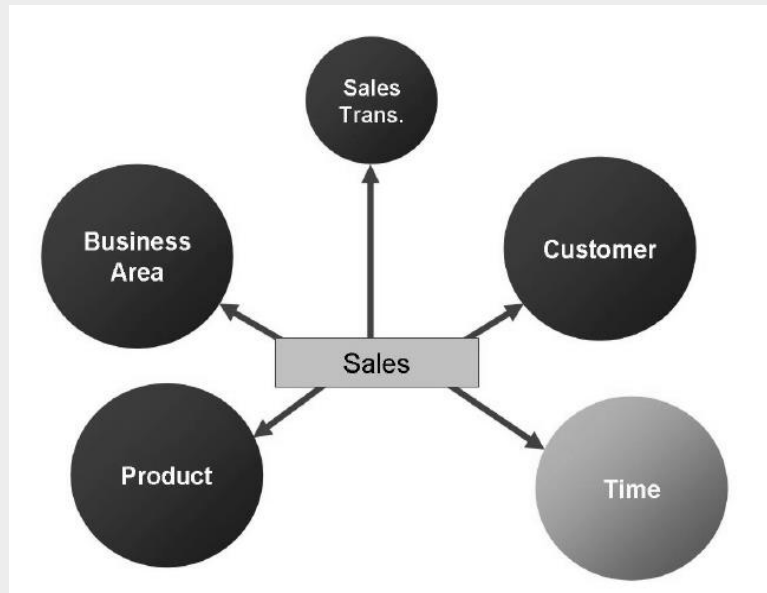
Steps to Create Logical Data Model



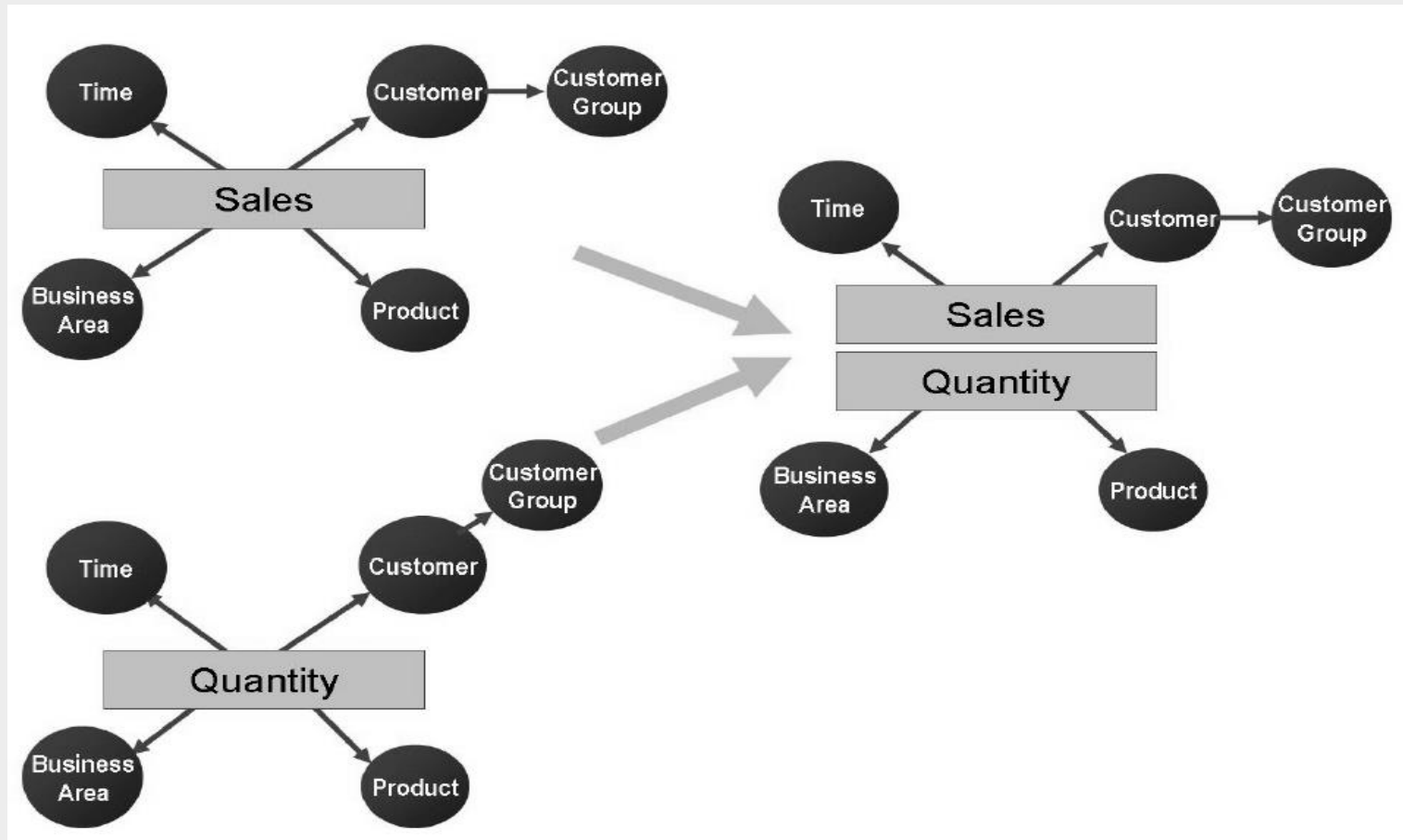


Steps (Contd..)

- **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



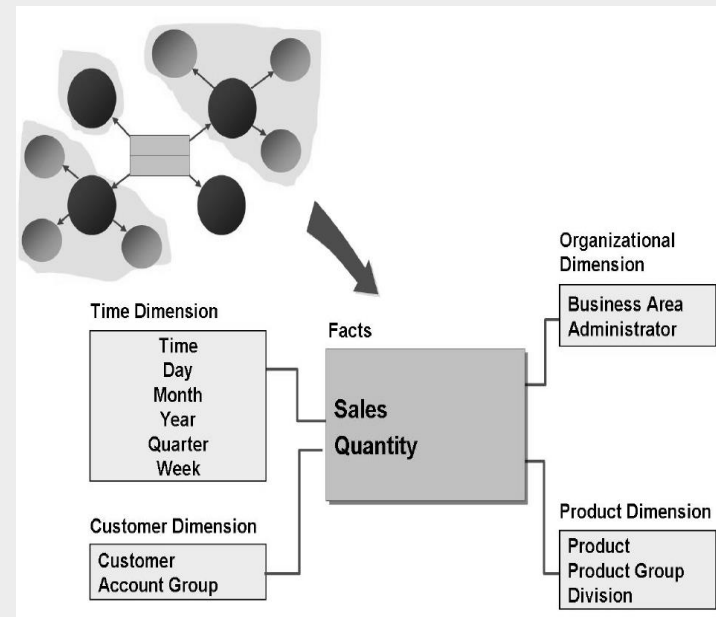
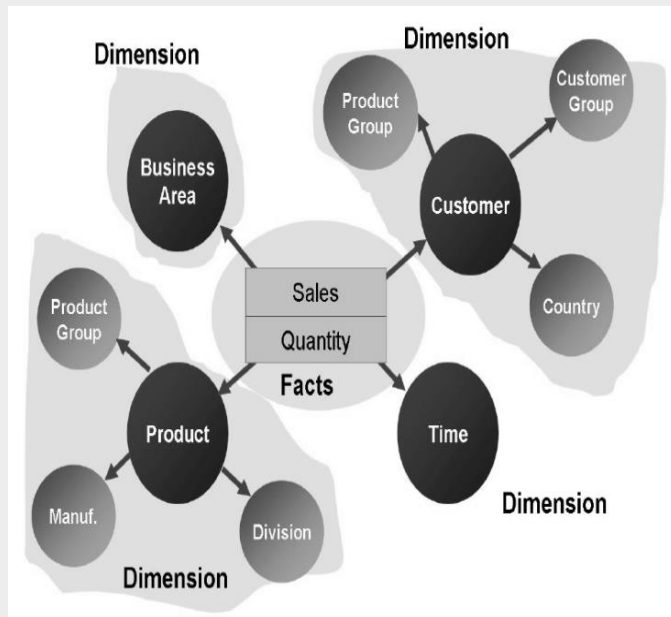


The BW Data Model

➤ 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".





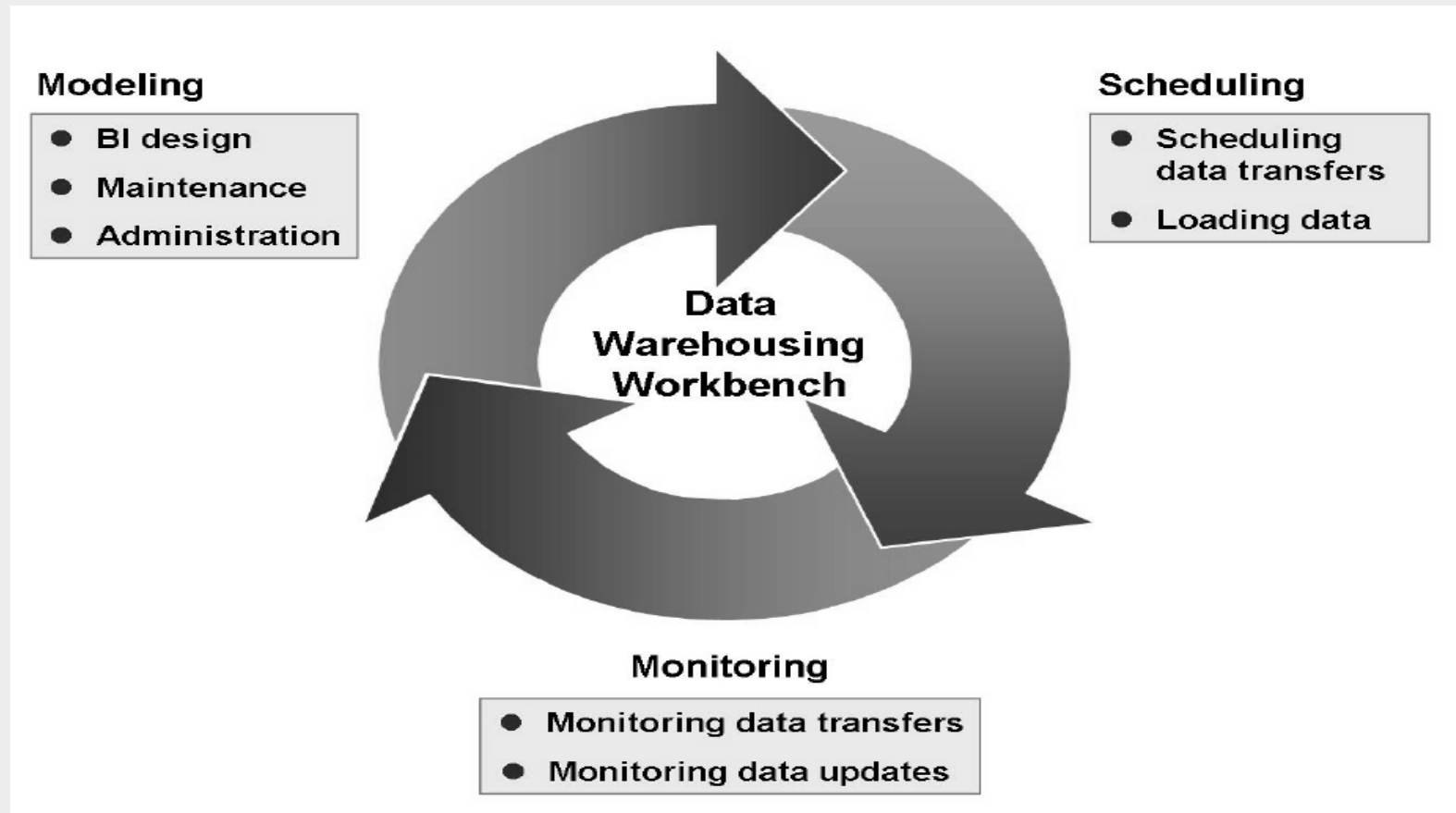
Modeling Overview

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 the Enterprise Data Warehouse

**Metadata
and
Document
Manage-
ment**

Data Modeling

Data Acquisition

Transformation

Data Distribution

Running the EDW

**User
Manage-
ment**

Administration & Monitoring

Data Flow Control

Performance Optimization

Information Lifecycle Management

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

Modeling

- Favorites
- Find
- Data Flows
- InfoProvider**
- InfoObjects
- InfoSources
- DataSources
- Source Systems
- Open Hub Desti
- Planning Sequel
- Process Chains

InfoProvider	Tech. Name	M ...	Execute Function	Display
Unassigned Nodes	NODESNOTCONNE...		Change	
Training	ZTRAINING		Change	
Training Infoarea - DM	ZTR_DM01		Change	
Discounts overview	ZDM_C02	=	Manage	
Sales overview - Cube Group 0 A	ZIC_0A	=	Manage	
Sales overview - DM	ZDM_C01	=	Manage	
ODSO ZDM_DS01 -> CUBE ZDM_C	00XH9WXP9UL5NU...	=	Change	
Sales overview	ZDM_DS01	=	Manage	InfoProvider
RSDS ZFF_DS01 ZSH_FILE	0QGG2BU8MFZQB...	=	Change	
Data Transfer Processes	ZDM_DS01		Create Data Tra...	
ZFF_DS01 / ZSH_FILE -	DTP_0002TL8ODL...		Change	
Sales overview	ZFF_DS01	=	Change	DataSources ZSH_FILE
Test - load sales	ZPAK_DASYZRAD1...		Execute	DataSources
Data Transfer Processes	ZDM_C01		Create Data Tra...	
Sales & Discount	ZDM_IS01	=	Change	
Sales & Discounts - Multiprovide	ZMP_0A	=	Change	
Sales & Discounts overview	ZDM_MP01	=	Change	
Sales Detail	ZDM_MP02	=	Change	
	ZDM_DS02	=	Manage	
	ZDM_DS04	=	Manage	
	ZDM_DS03	=	Manage	
	ZDM_DS01	=	Manage	
Sales overview - Group 0 A	ZDS_0A	=	Manage	
InfoArea By Girish Oak	ZTR_GOAK		Change	
training infoarea - AP	ZTR_ARUNPILL		Change	

Administration



The screenshot shows the SAP Administration interface. On the left, a tree view under 'Administration' lists various tasks. A blue overlay box in the center contains a list of tasks, with a blue arrow pointing from the 'Broadcasting' item in the tree to the overlay. The right side of the screenshot shows a table with process chain details.

Administration Task

- Process Chains
- Admin Cockpit
- Monitors
- Change Run
- Broadcasting
- Analysis Authorizations
- Metadata
- Search/Documents
- Migration 3.x Objects
- Remodeling
- Repartitioning
- Mass Activation of DADI SPOs
- Request Administration Archiving
- Analysis of BI Objects
- Current Settings

ch. Name	M ...	Execute FU
ODESNOTCONNE...		Change
/BR		Change
/S0TCTHP240	≠	Change
CT_MD_CACH_F...	≠	Change
CTHOS_AC	=	Change
CTHC_CHECK_...	=	Change
CT_MD_C_FULL...	≠	Change
CT_C2_INIT_DE...	=	Change
CT_C2_INIT_P01	=	Change
CT_C25_FULL_P...	≠	Change
CT_C21_INIT_D...	=	Change
CT_C0_FULL_P01	≠	Change
CT_C0_INIT_DE...	=	Change
CT_C2_INIT_P02	≠	Change
CT_C4_INIT_DE...	≠	Change
CT_C3_INIT_DE...	≠	Change
CT_MD_S_FULL...	≠	Change
Process chains for training		Change
Business Planning & Consolidation: Example		Change
Business Planning & Consolidation: Syster		Change



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**

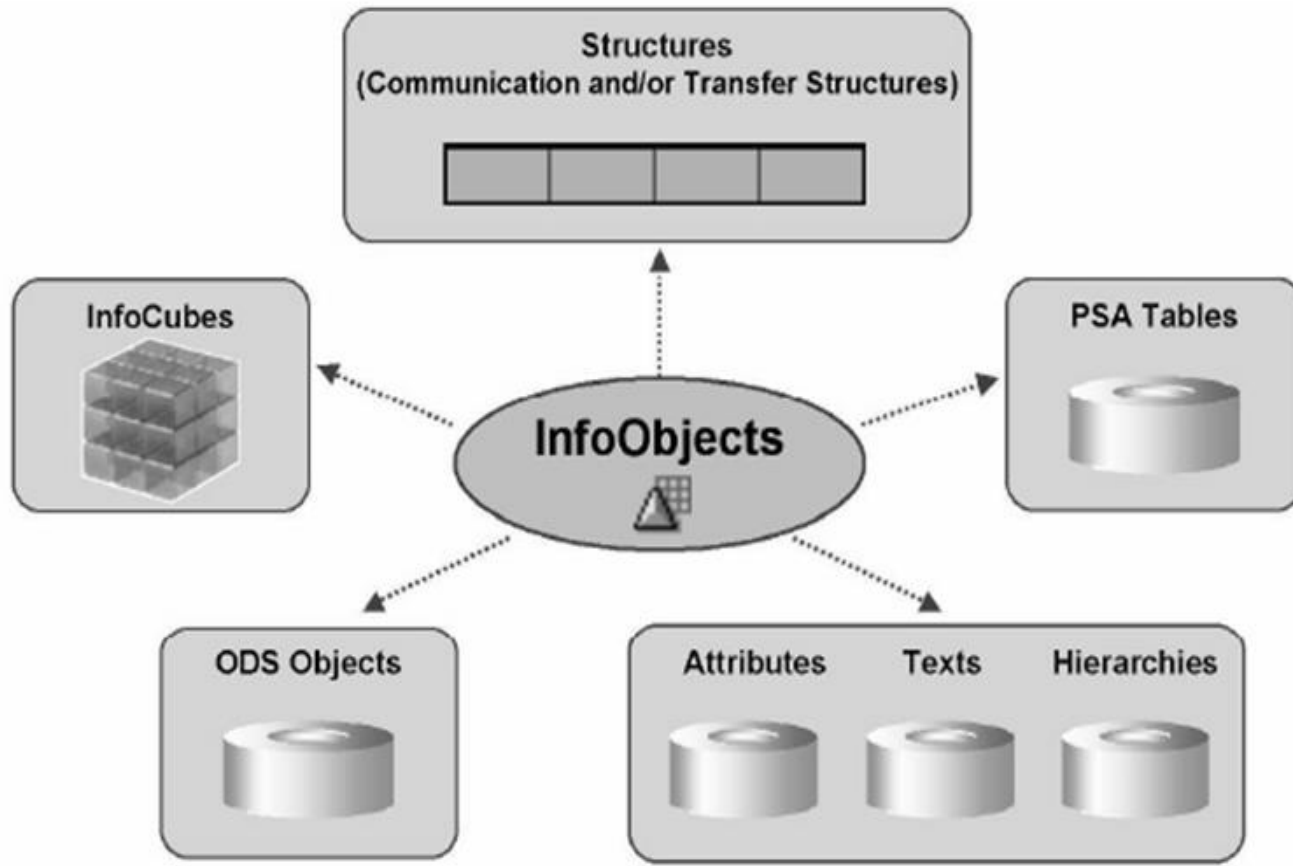
- As components of the Metadata Repository (the storage area for all BI objects), InfoObjects contain technical and business analyst information for master and transaction data in BI.



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.

Master Data Table

Mast. Data Tbl. TDep.

TDep. Attr. SID Tble

Screenshot: 'Attributes' Tab Page

Attribute		Type	Time..
0COMP_CODE		NAV	<input checked="" type="checkbox"/>
0BUS_AREA		NAV	<input checked="" type="checkbox"/>
0EVCURRCOST		DIS	<input checked="" type="checkbox"/>
0PROFIT_CTR		DIS	<input type="checkbox"/>
0ENTRYDATE		DIS	<input type="checkbox"/>

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
<i>Main District NORTH</i>	<i>Main District NORTH</i>
<i>District 1</i>	<i>District 2</i>
<i>District 2</i>	
<i>Main District SOUTH</i>	<i>Main District SOUTH</i>
<i>District 3</i>	<i>District 1</i>
<i>District 4</i>	<i>District 3</i>
	<i>District 4</i>

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

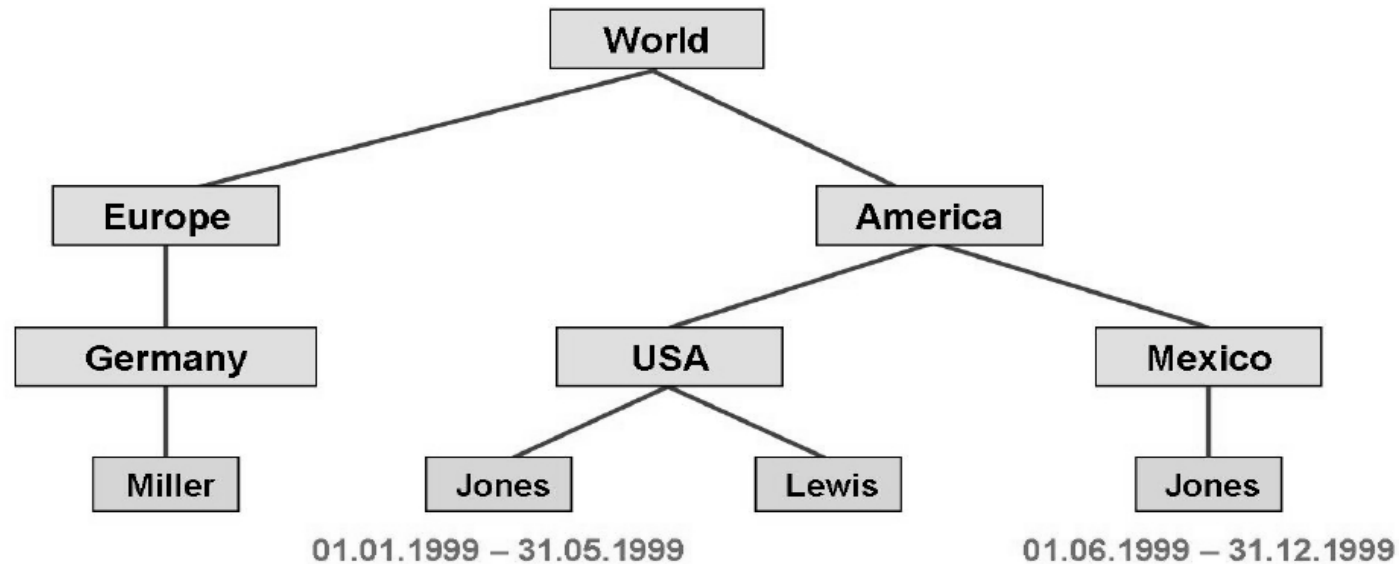
Hierarchy 01.01.1999 – 31.05.1999	Hierarchy 01.06.1999 – 31.12.1999
<i>Main District NORTH</i>	<i>Main District NORTH</i>
<i>District 1</i>	<i>District 2</i>
<i>District 2</i>	
<i>Main District SOUTH</i>	<i>Main District SOUTH</i>
<i>District 3</i>	<i>District 1</i>
<i>District 4</i>	<i>District 3</i>
	<i>District 4</i>



Hierarchies.. (Contd..)

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

Time-Dependent Hierarchy Structure for *Cost Center Char.*





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

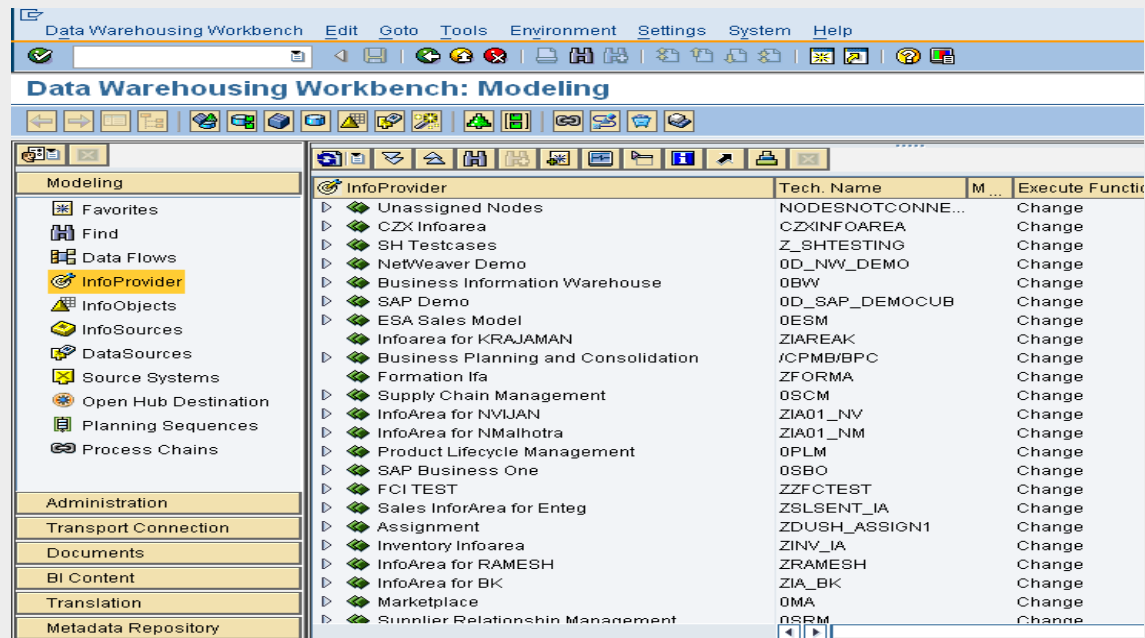
➤ You can define Key Figures InfoObjects and change settings on the following tab pages on the Maintenance menu:

- 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



Data Warehousing Workbench: Modeling

Data Warehousing Workbench: Modeling

Modeling

- Favorites
- Find
- History
- Data Flows
- InfoProvider
- InfoObjects**
- InfoSources
- DataSources
- Source Systems
- Open Hub Desti...
- Planning Sequen...
- Process Chains

Administration

Transport Conne...

Documents

BI Content

Translation

Metadata Reposit...

InfoObjects	Tech. Name	M ...	Execute Func...	Display Tree	O..	Object Infor...	Object Infor...
Infoarea for Test	ZINFO_TEST		Change	InfoProviders			
ISU Inventory Mgmt	MM_IM		Change	InfoProviders			
Training Infoarea	TRAINING		Change	InfoProviders			
training	TRAINING_2		Change	InfoProviders			
CHARACTERISTICS	TRAINING_INFOCAT_2	=	Change				
CHANNEL	ZD_CHNL	=	Change	InfoProviders			
PRODUCT	ZD_PRDT	=	Change	InfoProviders			
PRODUCT GROUP	ZD_PDGP	=	Change	InfoProviders			
KEY FIGURES	TRAINING_INFOCAT	=	Change				
PRICE	ZD_PRICEE	=	Change	InfoObjects			
QUANTITY	ZD_QTY_2	=	Change	InfoObjects			
REVENUE	ZD_REV_2	=	Change	InfoObjects			
BW Test Info Area	BW_TESTAREA		Change	InfoProviders			
Trainer Sept15	Z_BW_TRAINER_SEPT15		Change	InfoProviders			
CHAR CATALOG	ZT_CVI_18	=	Change				
Sales Info area	ZSALES_IA01		Change	InfoProviders			
InfoArea for Marbruin	ZMARBRUIN		Change	InfoProviders			
TRN Nvjjan	ZIA01_NV1		Change	InfoProviders			
Training Test08	ZTEST08		Change	InfoProviders			
InfoArea for User 00	ZIA_00		Change	InfoProviders			
Infoarea for BIM NL	ZBIMNL		Change	InfoProviders			
InfoArea MPIETSCH	INFOAREMPIETSCH		Change	InfoProviders			
Laptop sales	LSALES		Change	InfoProviders			
BW Training Day1	ZTEST_TRAINING_DAY1		Change	InfoProviders			
SAP BW TRAINING	MAM_PAUL		Change	InfoProviders			
Infoarea for DCN	ZDCN_TEST		Change	InfoProviders			
Capgemini UK EPM Demo Area	CG_EPM_UK		Change	InfoProviders			

SAP