Data Warehouse

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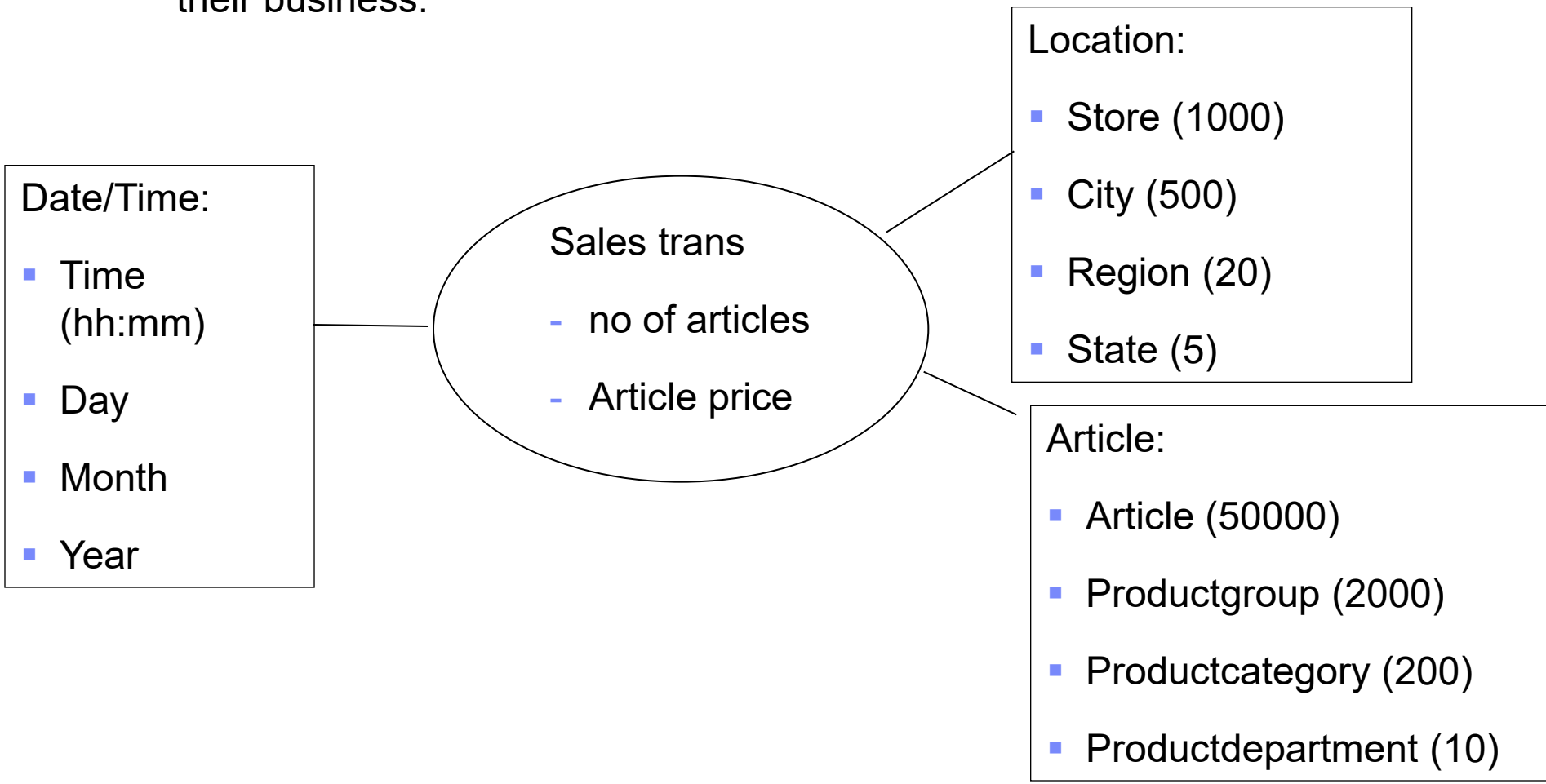
Exercise 2

- The following is a data model used by a supermarket chain to analyze their business:



Exercise 2

- With each transaction, an average of 20 different articles are bought.
- The data warehouse collects sales transactions data over 2 years.
- There are 1000 stores with 2000 transactions per store and day.
- Questions:
  1. How many records are stored in the fact table?
  2. What are the columns of the ROLAP fact table?
  3. What is the size of the cube (number of cells) that stores the aggregated values
     - at the most detailed level?
     - on day, article and store level?
  4. Compute the respective cube sizes for the other 3 (higher) hierarchy levels (Month, Year, City, Region, State, Productgroup, Productcategory, Productdepartment).

Exercise 2 - Results

1. How many records are stored in the fact table?
   1000 * 2000 * 20 * 730 = 29,2 Mrd.
2. What are the columns of the ROLAP fact table?
   Dimension keys: Article, Store, Time,
   Measures: Number, Price
3. What is the size of the cube (number of cells) that stores the aggregated values
   - at the most detailed level?
     1000 * 50000 * 730 * 24 * 60 * 2 = 105,12 Billionen = $1{,}0512 * 10^{14}$
   - on day, article and store level?
     1000 * 50000 * 730 * 2 = 73 Mrd.
4. Compute the respective cube sizes for the other 3 (higher) hierarchy levels (Month, Year, City, Region, State, Productgroup, Productcategory, Productdepartment).
   Kreuzprodukt alle Dimensionsstufen: 46,79 Mrd.

Exercise 2 - Results

Fact Table (relational)							in Mrd.	
Stores	**Transactions**	**Days**	**# Positions**					1.2
1000	2000	730	20	29.200.000.000			29,2	0.1
								0.048
Detail Level (Cube)								0.004
Location	**Product**	**Time**	**Facts**					0.012
1000	50000	1051200	2	105.120.000.000.000			105.120	0.001
								1.44

Aggregations:								
							ocation, Product	0.144
1000	50000	24	2	2,400,000,000	Time	2.4	ocation, Product	0.0072
1000	50000	2	2	200,000,000	Time	0.2	ocation, Product	0.0576
1000	2000	720	2	2,880,000,000	Product	2.88	ocation, Product	0.00576
1000	200	720	2	288,000,000	Product	0.288	ocation, Product	0.000288
1000	10	720	2	14,400,000	Product	0.0144	ocation, Product	0.0144
500	50000	720	2	36,000,000,000	Location	36	ocation, Product	0.00144
20	50000	720	2	1,440,000,000	Location	1.44	ime, Product, Location	0.000072
5	50000	720	2	360,000,000	Location	0.36	ime, Product, Location	0.048
1000	2000	24	2	96,000,000	Time, Product	0.096	ime, Product, Location	0.004
1000	2000	2	2	8,000,000	Time, Product	0.008	ime, Product, Location	0.0048
1000	200	24	2	9,600,000	Time, Product	0.0096	ime, Product, Location	0.0004
1000	200	2	2	800,000	Time, Product	0.0008	ime, Product, Location	0.00024
1000	10	24	2	480,000	Time, Product	0.00048	ime, Product, Location	0.00002
1000	10	2	2	40,000	Time, Product	0.00004	ime, Product, Location	0.00192
			20	200	2	2	16,000	Time, Product, Location	0.00016
			20	10	24	2	9,600	Time, Product, Location	9.6E-06
			20	10	2	2	800	Time, Product, Location	8E-07
			Summe:						**46.79**