

Lecture 8



Dimensional modeling

Learning Objectives

- Define 2 kinds of changes in dimensions
- Define 4 types of handling slow changes
- Define 1 type of handling large changes

Changing Dimensions

- Dimension attributes evolve over time
 - For example, customers change their names, move, have children, adjust their Incomes
- For every dimension attribute, need to identify “Changes” strategy
 - May use combination of strategies within same dimension table

Changing Dimensions

- Slowly Changing Dimensions
- Large Changing Dimensions

Slowly Changing Dimensions

- When dimensions change not very frequently
- 3 types of handling the changes

Type 1: overwrite the value

Type 2: add a dimension row

Type 3: add a dimension column

Slowly Changing Dimensions

Type 1: overwrite the value

Product Key	Product Description	Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Education	ABC922-Z

Product Key	Product Description	Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Strategy	ABC922-Z

Slowly Changing Dimensions

- ❑ What if Cust 3A422 moves to CA on 12/1/2005?
- ❑ Using **Type 1**:

Customer Dim

Cust Key	Cust Code	Last Name	Zip
1	3A422	Thorntwaite	48192 94025
2	1B427	Jones	10019

Order Facts

Cust_Key	Date	Amount
1	12/23/2003	\$200.00
1	12/23/2004	\$800.00
2	8/9/2004	\$12.00
1	12/23/2005	\$100.00

- ❑ Report request for Sales by Zip on 12/24/05:

<u>Zip</u>	<u>Order Amount</u>
94025	1,100.00
10019	12.00

Slowly Changing Dimensions

Type 2: add a dimension row

Product Key	Product Description	Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Education	ABC922-Z
25984	IntelliKidz 1.0	Strategy	ABC922-Z

Slowly Changing Dimensions

- ❑ Using **Type 2** (must have surrogate key):

Customer Dim

Cust Key	Cust_Code	Last_Name	Zip	Eff_Date	End_Date	Is_Current	Change Reason
1	3A422	Thorntwaite	48192	12/23/1998	11/30/2005	N	NW
2	1B427	Jones	10019	8/9/2004	12/31/9999	Y	NW
3	3A422	Thorntwaite	94025	12/1/2005	12/31/9999	Y	ZP

Report request on 12/24/05: Sales by Zip

State	Order Amount
48192	1,000.00
94025	100.00
10019	12.00

Order Facts

Cust_Key	Date	Amount
1	12/23/2003	\$200.00
1	12/23/2004	\$800.00
2	8/9/2004	\$12.00
3	12/23/2005	\$100.00

Slowly Changing Dimensions

Type 3: add a dimension column

Product Key	Product Description	Department	Prior Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Strategy	Education	ABC922-Z

Slowly Changing Dimensions

3 Ways to Handle Changing Dims



Overwrite

✓ Type 1

- ✓ + Simple & Fast
- ✓ + No Dim Key Chg.
- ✓ - Lose history
- ✓ - Must rebuild aggregates



Add a **R**ow

✓ Type 2

- ✓ + Preferred Method
- ✓ + Partitions History
- ✓ + No Data Changes
- ✓ Hint: Current Row Indicator



Add a **C**olumn

✓ Type 3

- ✓ + Alternate Reality
- ✓ - Limited # of Apps
 - ✓ Lose Intermed.
 - ✓ Can use "Prior"
- ✓ - Can't trend changes
- ✓ Common - Sales Org



Hybrid Slowly Changing Dimension Techniques

Product Key	Product Description	Current Department	Historical Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Education	Education	ABC922-Z

Product Key	Product Description	Current Department	Historical Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Strategy	Education	ABC922-Z
25984	IntelliKidz 1.0	Strategy	Strategy	ABC922-Z

Product Key	Product Description	Current Department	Historical Department	SKU Number (Natural Key)
12345	IntelliKidz 1.0	Critical Thinking	Education	ABC922-Z
25984	IntelliKidz 1.0	Critical Thinking	Strategy	ABC922-Z
31726	IntelliKidz 1.0	Critical Thinking	Critical Thinking	ABC922-Z

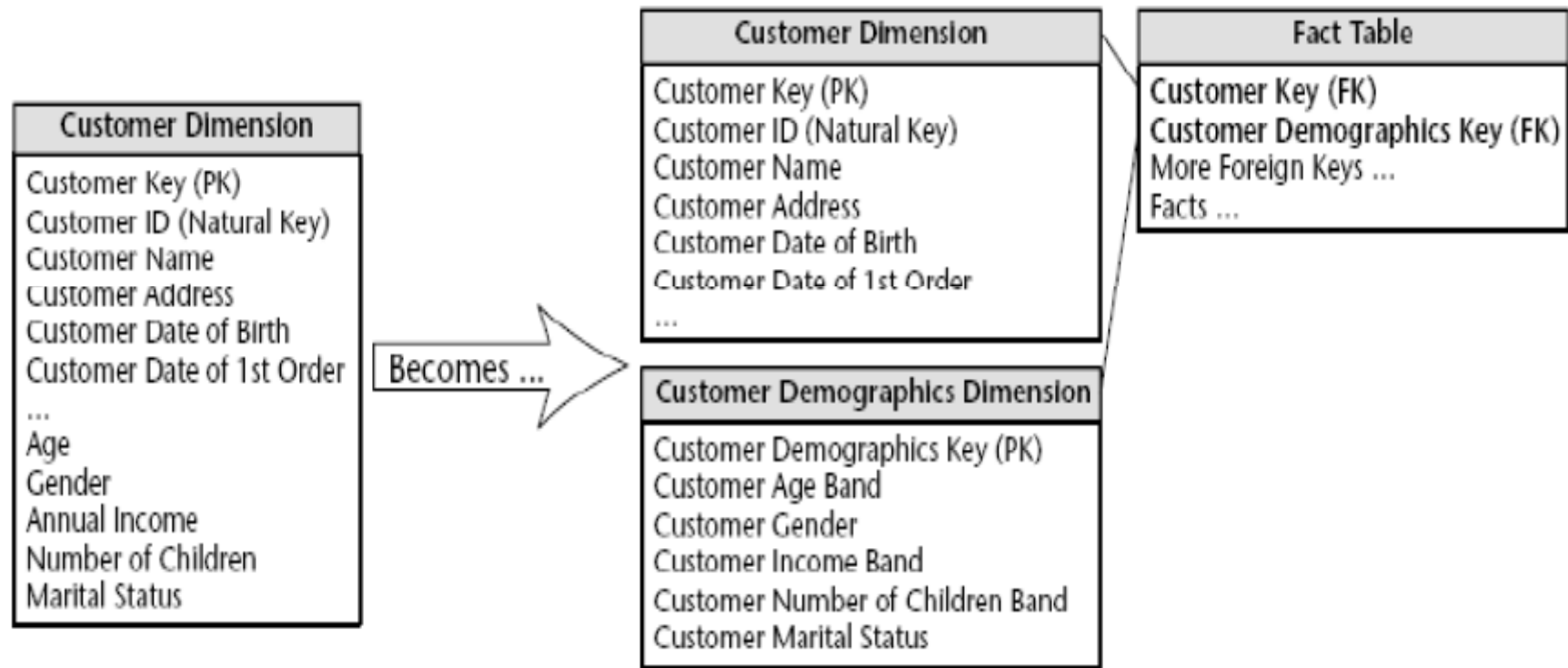
Large Changing Dimensions

Minidimension

DEMOGRAPHIC KEY	AGE	GENDER	INCOME LEVEL
1	20-24	Male	<\$20,000
2	20-24	Male	\$20,000-\$24,999
3	20-24	Male	\$25,000-\$29,999
18	25-29	Male	\$20,000-\$24,999
19	25-29	Male	\$25,000-\$29,999

Table 6.3 Sample Rows from a Demographic Minidimension

Large Changing Dimensions



The fact table serves to track the changes