



# Technologies for Information Systems

prof. F. A. Schreiber, prof. L. Tanca - 30 Jan 2008

Available Time 2h

**Surname** \_\_\_\_\_

**Name** \_\_\_\_\_

**Student ID** \_\_\_\_\_ **Signature** \_\_\_\_\_

VintageFurniture.com is a US online furniture store with thousands of customers spread over the United States. By looking at the balance sheet of the past year, the CEO guessed that the products and the customers' portfolio are probably too diversified, and the related income does not justify the effort needed to handle such a complexity. Since you are quite expert in data-warehousing, try to help the CEO in identifying bad products and customers to be left out, designing a data-warehouse based on the following portion of the company relational database.

**FURNITURE** (fur-id, name, description, material, price, type, category)  
**CUSTOMER** (c-id, first-name, last-name, business-name, address, city, county, state)  
**SALE** (fur-id, c-id, date, n-of-pieces, discount)  
**DATE** (date, weekday, trimester)

where type = {chair, shelf, table, wardrobe, ...} and  
category = {kitchen, bedroom, bathroom, ...}

- Infer the ER-schema from the relational schema shown above.
- Build the attribute tree representation from the ER-schema.
- Identify possible relevant facts, measures, analysis dimensions and their hierarchies, taking into account the following information:
  1. Sales information can be retrieved from the relational database.
  2. The furniture needs to be analyzed w.r.t types and categories.
  3. Customers need to be analyzed w.r.t. their geographical location (city, county and state).
- Propose a conceptual model (star or snowflake schema) for the identified facts.
- Show the logical schema of the conceptual model defined at the previous step.
- Show the SQL statements needed to create fact and dimension tables, along with the related hierarchies.
- Show the SQL statements needed to create a single analysis cube that stores the total number of sales, total incomes and total discounts w.r.t. cities, type of the furniture and months in every possible combination.