CSE4110 – Database System

Project1. E-R design and Relational Schema design

Spring 2022

Electronics Vendor company

"You are a DBA in this company"

Goal : The goal of this project is to provide a realistic experience in the conceptual design, logical design, implementation, operation, and maintenance of a relational database and associated applications.

Application description :

The application is an electronics vendor that operates both a Web site and a chain of many physical stores. Examples include Best Buy and Circuit City. To find out more about this application, think about any experiences you may have had making purchases both online and in-store, and browse their Web sites.

In our hypothetical company, it has been decided to redesign a major part of the database that underlies company operations. Unfortunately, the manager assigned to solicit database design proposals is not very computer literate and is unable to provide a very detailed specification at the technical level. Fortunately, you are able to do that.

Here are a few points to consider :

- There are many different products, grouped into a variety of (possibly overlapping) categories. Groupings can by type of product (cameras, phones, etc.), by manufacturer (Sony, Apple, etc.), or by other means (for example, a Gateway PC might be packaged with a Sony monitor and an HP printer and marketed as a package).

- Some customers have a contract with the company and bill their purchases to an account number. They are billed monthly. Other customers are infrequent customers and pay with a credit or debit card. Card information may be stored for online customers, but not for in-store customers.
- Online sales must be sent to a shipper. The company needs to store the tracking number for the shipping company so it can respond to customer inquiries.
- Inventory must be accurate both in stores and in warehouses used to replenish stores and to ship to online customers. When inventory is low, a reorder should be sent to the manufacturer and listed in the database. When goods arrive, inventory should be updated and reorders marked as having been filled.
- Sales data are important for corporate planning. Marketers may want to look at sales data by time period, product, product grouping, season, region (for stores), etc.

Project Requirements :

1. E-R Model
    - Construct an E-R diagram representing the conceptual design of the database.
    - At minimum you must include all the entity and relationship sets implied by this description. You may go beyond the minimum. Remember that the manager who defined the specifications is not computer literate so the specifications should not be viewed as necessarily being precise and complete.
    - Be sure to identify primary keys, relationship cardinalities, etc.

2. Relational Schema Diagram

- After creating an E-R model, reducing it into Schema diagram
- Create the schema diagram in ERwin Data Modeler we discussed in practice session.
- Be sure to allow us to store information without unnecessary redundancy.
- Be sure to identify primary keys, foreign keys, relationship cardinalities, relationship type, allowing nulls and so far.
- Every entities should have name and primary key(s).

3. Queries

The queries listed below are those that your client (the manager from the package delivery company) wants turned in. They may provide further hints about database design, so think about them at the outset of the project.

- Assume the package shipped by USPS with tracking number 123456 is reported to have been destroyed in an accident. Find the contact information for the customer. Also, find the contents of that shipment and create a new shipment of replacement items.
- Find the customer who has bought the most (by price) in the past year.
- Find the top 2 products by dollar-amount sold in the past year.
- Find the top 2 products by unit sales in the past year.
- Find those products that are out-of-stock at every store in California.
- Find those packages that were not delivered within the promised time.
- Generate the bill for each customer for the past month.

What to turn in :

- E-R diagram (not hand drawn) made by any chosen tools (e.g. MS Powerpoints)
- Relational Scheme diagram ERwin file (.erwin)
  - student_id.erwin (submitted filename) e.g. 20229999.erwin
  - Be sure to same display options in practice session. (IE notation, display relationship cardinality)
  - Use the title in schema diagram and description if you needed.
- Report file (.pdf)
  - [project1] student_id.pdf (submitted filename)

    e.g. [project1] 20229999.pdf
  - Describe the detail explanation about your E-R model and Schema diagram that you made.
  - MAKE YOUR OWN DESCRIPTION on every entities and relationships you made.
  - Feel free to use any template you made.

NOTICE :

- 2022.04.28(Thu) 18:00
- Submit your soft copy with title "[DBproject1] student_id" to

rheejm94@sogang.ac.kr (softcopy includes erwin and pdf file you wrote)

- Submit your hardcopy to box in front of AS809 before the deadline.

  (hardcopy includes one E-R model picture and one report you wrote)
- **DON'T COPY ANYTHING FROM YOUR FRIENDS AND WEB SOURCES. IF YOU VIOLATE THIS, YOU WILL GET F FOR THIS COURSE.**