

Database Design Project

CIS8040 Database Management Systems, spring 2010, Jack Zheng

Overview

In this project, each student group will design and implement a database for an apartment leasing business. Each group will deliver a presentation to report their work (at various stages). The purpose of the project is to gain practical and firsthand experience on business analysis and database design.

Business Scenario

Potem Properties owns approximately 2000 apartment homes in 18 communities throughout the Metro Atlanta area. The company recently has started an e-business initiative to manage most of its administration and service activities using a computer information system. The system is designed for one of its 18 sites first, and will be eventually rolled out to serve all of its properties and customers.

Initially, the system should provide support to three major functional areas:

A. Rental management: managing rental related activities such as application, applicant, contract, payment, etc.

- Application: searching available unit; recording application process (status); recording applicant information.
- Contract management: managing and monitoring lease contract (contract type, status, etc.); managing pricing (rent plan, promotions, discounts, etc.).
- Resident information (including pets and vehicles).
- Resident charges and payments: monthly rental payments; billing and payments for various fees and charges.

B. Property management: managing properties such as building, unit, appliance, pricing, and contractor service, etc.

- Apartment unit management: recording information of units, floor plans, and buildings.
- Appliance management: recording and managing the major appliances and its status in each unit, such as refrigerator, washer/dryer, stove, air conditioner, carpet, etc.
- Property service management (current and past): recording status of services to rooms, buildings, appliances, etc.
- Contract service management: managing the services contracted to 3rd party companies, such as appliance repair and installation, garbage, unit cleaning and remodeling, community or public cleaning, etc.; managing the status, billing and payment to contractors.

C. Community service through a website: providing online services to residents.

- Portal user management: user accounts and passwords.
- Online billing and payment: recording renter's payment for rent and other fees online.
- Service request and tracking: users submit request online and track the status online.
- Events and facility reservation: checking various events online, including community event, party, private event, maintenance schedule, etc.; reserving facilities (amenities such as pool, guest house, small theater, tennis court, etc.) for events.
- Online bulletin board: news, announcements and other posts by management and residents.

Task

Your team is with a consulting company which is hired to develop this information system. Your team's job is to design and implement a database using SQL Server 2008 for one of the three major functional areas (there will be 3 groups assigned to each functional area). At this time, the management has not elicited the requirements in detail yet, so part of your job is to analyze the business and document the requirements. I, the instructor, will serve as a company representative whom you will work with to sort out requirements.

Deliverables

There are 3 major deliverables. Detailed information and submission requirements will be provided in separated documents.

Deliverable #1: requirement analysis and conceptual model.

Deliverable #2: logical model and revised deliverable #1.

Deliverable #3: implemented database in SQL Server 2005 (with tables, keys, diagrams, views and structure) and final report (including revised previous deliverables, project summary and group evaluation).

General Project Process

1. Form groups and assign functional area.
2. Requirement analysis and conceptual modeling:
 - a. work with the instructor in class for requirement analysis;
 - b. create an ER diagram (using Visio 2007) and associated data dictionary;
 - c. submit deliverable #1;
 - d. presentations by selected group.
3. Logical database design:
 - a. transform the conceptual ERD into a logical diagram using Visio;
 - b. create tables, attributes, keys, etc.;
 - c. modify the ER diagram if necessary;
 - d. normalize the tables if necessary;
 - e. submit deliverable #2;
 - f. presentations by selected group.
4. Database implementation and application:
 - a. create the database (tables, keys, constraints) using SQL Server 2008;
 - b. enter enough sample data;
 - c. create queries to demonstrate the use of the database;
 - d. presentations by selected group.
5. Summary:
 - a. submit the final report (deliverable #3).

Presentation

Each group will deliver at least one presentation on one of the deliverables. The presentation is informal and is an opportunity for the class to discuss your design and give feedback. The following table shows the general presentation assignment plan. Check the schedule for exact presentation assignment and date.

Deliverable #1 Presentation: conceptual models	2 groups (one group for each functional area)
Deliverable #2 Presentation: logical models	2 groups (one group for each functional area)
Deliverable #3 Presentation: implementations and queries	2 groups (one group for each functional area)

Grading

Deliverable #1 written report	20%
Deliverable #2 written report	20%
Deliverable #3 written report	50%
Project progress	10%

Grading details for each deliverable will be provided with the corresponding deliverable document.

General grading considerations are:

- 1) design quality and completeness of your written report;
- 2) clarity and professionalism of your written report;
- 3) project plan and progress.