CIT 381 Database Systems

Requirements Analysis Example

I. Designers meet the client

Bookstore owner B is working with database designers D1 and D2. The owner B has thought a lot about what is needed:

“I would like my customers to be able to browse my catalog of books and place orders over the internet. Currently I take orders over the phone. I have mostly corporate customers who call me and give me the ISBN number of a book and a quantity; they often pay by credit card. I then prepare a shipment that contains the books they ordered. If I don’t have enough copies in stock, I order additional copies and delay the shipment until the new copies arrive; I want to ship a customer’s entire order together. My catalog includes all the books I sell. For each book, the catalog contains its ISBN number, title, author, purchase price, sales price, and the year the book was published. Most of my customers are regulars, and I have records with their names and addresses. New customers have to call me first and establish an account before they can use my website.

“On my new website, customers should first identify themselves by their unique customer identification number. Then they should be able to browse my catalog and place orders online.”

II. Designers get to work

D1 and D2 review their notes and design an ER diagram:

entity: books
attributes: isbn, title, author, qtyInStock, price, yearPublished

entity: customers
attributes: custId, custName, custAddress

relationship: orders
attributes: qty, orderDate, cardNum, shipDate

III. Time for the design review meeting

D2: “What if a customer places two orders for the same book in one day?”

D1: “The first order is handled by creating a new orders relationship and the second order is handled by updating the value of the quantity attribute in this relationship.”

D2: “What if a customer places two orders for different books in one day?”
D1: “No problem. Each instance of the orders relationship set relates the customer to a different book.”

D2: “Ah, but what if a customer places two orders for the same book on different days?”

D1: “We can use the attribute orderDate of the orders relationship to distinguish the two orders.”

D2: “Oh no you can’t. The attributes of customers and books must jointly contain a key for orders. So this design does not allow a customer to place orders for the same book on different days.”

D1: “Yikes, you’re right. Oh well, owner B probably won’t care. We’ll see.”

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