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Database Design

Miniworld

The miniworld I have chosen is a Video Store chain called Mat-Su Video. It is a series of stores that hold a large catalog of films for customers to rent. Some of the Mat-Su Video stores have a CinePlex that does showings of films for free. Customers can also buy snacks, drinks, shirts, merch, and all other sorts of things for this beloved Video Store.

Entities, Attributes, and Relationships

Movie
-MovieID
-Title
-Year
-Genre

MediaType
-MediaTypeID
-Format
-MPAA
-Distributor
-Runtime
-Aspect Ratio
-Languages (plural attribute)
-Subtitles (plural attribute)
-Copies

Employee
-EmployeeID
-First Name
-Last Name
-Position
-Phone Number
-Address
-Favorite Movie
-Hourly Pay
-ClockedIn (bool)
-Overtime (bool)
-HoursWorked

Customer
-CustomerID

-Name
-Phone Number
-Address
-Member(bool)

Membership(Weak Entity of Customer)
-MembershipLevel
-FreeMovies
-ConcessionDiscount

Wishlist (Weak Entity of Customer)
-Title
-Year

Rented(Weak Entity of Customer)
-MediaTypeID
-Employee
-Title
-DueDate
-Overdue(bool)

Store
-StoreID
-Address
-CinePlexBool
-Owner

CinePlex Showings
-StoreID
-CinePlexID
-EmployeeID
-MovieTitle
-Date
-Time
-MPAA
-HostName

Event
-EventID
-EventName
-EventOrganization
-EventDescription

Concessions

-CinePlexID
-ConcessionID
-Concession Item
-Price
-Quantity

Shirts
-ShirtID
-Shirt Name
-Type
-Color
-Size
-Price
-Stock

Merch
-MerchID
-Item Name
-Price
-Stock

As for relationships, customers can rent movies (through an employee), buy merch, shirts, snacks, drinks, candy, and concessions. Employees can screen films at the CinePlex. Movies will have many different mediatypes, depending on all the attributes in the mediatype entity, things like whether its vhs, dvd, bluray, unrated, different aspect ratios, etc. And mediatypes will have a boolean on whether they are rented or not.

ER Diagram Assumptions

Assumption 1: The database will be used primarily for managing movie rentals, customer information, inventory, and employee data related to Mat-Su Video stores.

Assumption 2: Customers can rent movies, purchase merchandise and concessions, participate in a membership program, and manage their wishlists through the database interface.

Assumption 3: Employees can update inventory, process transactions, manage employee information, and access specific views tailored to their roles within the organization. One employee may work at one store, but one store may employ many employees.

Assumption 4: A Store may or may not have a CinePlex, and if it does, the database will show the events and movies being played at the Cineplex. A store will also have a catalog of concessions that it sells.

Assumption 5: The database will support concurrent access by multiple users, ensuring data consistency and integrity through concurrency control mechanisms.

Assumption 6: The database will be scalable to accommodate growth in the movie catalog, customer base, and transaction volume over time.

Target Audience

Casual - Higher level employees use it to add new movies and things to the product lists with the proper authorization, mainly Managers.

Naive - Customers use it to see which movies, showings, merch, and snacks are available at the stores.

Sophisticated - Me

Stand Alone - Lower level employees (clerks) use it to update minor things in the database, like whether a movie is rented, who rented it, etc.

System Analysts - Me

Application Programmers - Me

Database Administrators - Me

Purpose

The purpose of the database is to keep track of all sorts of things in the Mat-Su Video store chain. Things like stocks of movies, whether they are rented or not, if they are playing at the CinePlex anytime soon, and also to see what snacks, concessions, and merch is available for customer purchase.

For employees it is used to track their salary and to keep track of everything going on at Mat-Su Video.

DATA REQUIREMENTS

1. A Video Store has Movies. Movies have an ID (Unique Identifier), A Title, A Genre, And a YEAR it came out.
2. A Movie has several MediaTypes. A MediaType has an ID as a Unique Identifier, and the MovieID associated with the MediaType. It will also have a format, a distributor, AspectRatio, MPAA rating, and options for Subtitles

and Languages. These are all the things you would find on the back of any box of a movie.

3. A Customer will have an ID, Name, Address, and Phone Number. They will also have a Membership, which has three levels: Basic, Pro, and Master. If you are Basic, you get no free movies and no discount. If you are Pro you get 5 free movies and a 15 percent discount. If you are Master you get 10 free movies and 20% discount. A Customer may also have a wishlist of movies they may rent in the future. Customers rent Movies. When they rent a Movie, they will rent a specific MediaType of the Movie, which will come with a due date, if it goes past the due date, the MediaType becomes Overdue. A MediaType must be rented through an Employee.

4. An Employee has an ID, A First Name, Last Name, Address, Position, Phone Number, and a Favorite Movie. They will input MediaType Rentals and work at 1 store.

5. A Store has an ID, an Owner, an Address, and a Cineplex Bool which will either be true or false if there is a Cineplex. A store also sells Items, hosts Events, and may or may not have a CinePlex.

6. Items have an ID, Title and a Price and can be a Concession, Merch, or T-Shirt. A Concession will have a Type which can either be a Food, Drink, or Candy and it will have an expiration date. A Merch will have a Type. A T-Shirt will have a Color, Material, and Size.

7. Events have an ID, Date, Time, Description, Organization, and Name.

8. A Cineplex will have an ID, A Title for a movie, a date, a time, and an MPAA rating.

Interview #1 - George Howard (Wasilla Blockbuster, phone call) Sophisticated User

Q: As a sophisticated user, what are the first things that might come to mind when designing a database for a video store.

A: Well first of all you would need movies of course.

Q: Haha. Of course.

A: I think what someone might *think* a video store database might need is things like the names of the directors and actors and what not, but they already have all that on IMDB. This is a video store database, not a movie database. Things you *would* need is how you are going to sort them, and if you go to any video store there's really only two ways to sort movies for the average movie lover, either by genre or just by abc's like how Movie Gallery does it. I prefer genre. You don't want The Santa Clause 3 in the same section as Showgirls.

Q: Then sort by ABC's.

A: Yea. Though you wouldn't want Nightmare on Elm Street 2 coming after Nightmare on Elm Street 4 or 5. That would be taking your ABC's too seriously, make sure your sequels are in order, go by number, then release date. Basically, you would just need the title, the genre, whether it's a new release or not. Maybe you have like a greatest hits section or something. Don't get too fancy with the fringe subgenres, things can get lost that way.

Q: So you're talking about representing it in the database where someone might find the case physically in the store.

A: Yea! Genre is great for that. Maybe have an employee favorites for morale.

Q: So, in this hypothetical Video Store we would also be doing screenings in the backroom for a cineplex.

A: Ah perfect! You would need to design it for the date and time, and what movies you are showing of course, ticket pricing, whatnot.

Q: These would be free screenings.

A: Even better, something else you can think about is using the space for events, not just movies. Like maybe a drink and draw night or open mic, have businesses sponsor it. You would need a new entity for that.

Q: That's a great idea!

A: As a sophisticated user I would make sure everything makes sense for whoever is viewing it, Employees are going to use it alot.

Q:Casual users.

A: Yea and I imagine you would want the customers to be able to check the catalog through an easy to use front end. Both of these types of users would need their own types of views and privileges. Customers can reserve a movie for twenty-four hours to come pick up, but can only rent through an Employee. Things like that.

Q: Lots of great ideas, thank you!

A: Of course! See ya at the movies!

This was informative. Things I got out of this is not overcomplicating the MOVIE entity, just have the title, genre, and year. This is a better representation of the physical world of the video store. I also thought having community events in the cineplex was a good idea.

Interview # 2 Kendall Beck (Movie Madness Portland Employee/Friend, facetime) Casual User

Q: Hey Kendall.

A: Hi Kenneth.

Q: So first of all what kind of information would you need as an Employee of a Video Store like Movie Madness?

A: Uh, I guess I just need to know movies and what section I can find them, what the inventory is, how many days left for a movie to be returned. That's about it really, that's all I have to deal with at Movie Madness.

Q: Yea but you'd need to interact with the database right?

A: Uh yea. I guess there's lots of data entry. Whenever new releases come in, we gotta put them in the database.

Q: So you'd probably need good scalability.

A: What's that?

Q: Just lots of room for inventory and transactions as more movies come out.

A: Oh yea, I guess that'd be important. Lots of movies always coming out and customers asking for specific titles we might not have. I don't really know how all the technical stuff works, it's all pretty laid out for me. When the store is slow we're mostly just adding new releases into the inventory, and if something isn't a new release anymore we have to find a genre to put it in. We argue alot about that, all in good fun of course hehe.

Q: So you must have some kind of account when at work right?

A: Yea, you have to put your id down when doing a transaction so we know who's doing what, they also let us put our favorite movie on our account or recommendations. Customers don't really give a shit about that, but it's nice. We can also check our hourly wage and how many hours we've worked in a week so we can tell them if we're about to hit overtime. They get really mad at us if we don't tell them.

Q: Who's they?

A: Uh the gremlin. (Kendall shows the prop puppet of a gremlin they have overlooking the store).

Q: He's the owner?

A: Yea, haha.

Q: Thanks man!

A: You got it.

Basically what I got out of this is specific views for employees, and the ability to update inventory. Plus being able to track your hours worked and see your wages. I have added those to the EMPLOYEE entity. Also maybe adding movie props for display at the video store like at Planet Hollywood and Movie Madness.

Interview #3 Austyn Spaulding (Casual Movie Fan/Friend, facetime) Naive User

Q: Hey Austin.

A: Sup Kenneth. Did you see Dune 2?

Q: Yea it was incredible.

A: Right?!

Q: Let's stay on topic first then we can talk about movies.

A: Sounds good!

Q: So let's say there's a Video Store in your hometown with a website, what kind of information would you need on the website.

A: God I miss renting movies. I feel like I was able to watch more movies that way, with streaming it's too easy to spend too much time trying to decide what to pick. Back when there was Blockbuster you had to decide what you want and then you *had* to watch it when you got home.

Q: I have my own feelings about Blockbuster as a business.

A: What's wrong with Blockbuster?

Q: They ruined the Mom and Pop video store, but that's not relevant right now.

A: Ah I see. I guess on the website I think it would be cool to know when certain movies will be coming out so I can reserve a copy. Also just to be able to see what you got, like at the library computers. Oohh maybe a wishlist feature?

Q: You probably want it to be easy to use.

A: Well of course. Oh, maybe I can get like an instagram notification whenever a movie I want to watch comes available? Also maybe like a membership rewards program? Like if I rent five movies the fifth one is free?

Q: I like the idea of a membership program.

A: Yea that would be tight.

Q: Well thanks for taking time out of your day for this interview!

A: You got it.

I think the biggest takeaway I got from this is the addition of a membership program and a wishlist feature. I imagine the user would get some kind of notification when a movie on their wishlist becomes available.