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**DATABASE ANALYSIS AND DESIGN**

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**1. Business Requirements**

A store owner has a rental store where he keeps more than 3000 movies that need to keep track of. For each movie, Group A needs to know its title and category like comedy, suspense, drama, action, war, or sci-fi. He has at least one DVD or VHS tape for each movie he tracks, and each DVD or VHS tape is always a copy of a single, specific movie.

We need to create two entities in the first Movie: movie-id, title, and category. The second one we need to create for specific movie media with attributes like media-id, type (DVD or VHS tape), and address.

The owner is frequently asked for movies starting with specific actors. They are Mel Gibson and Julia Roberts therefore he likes to keep track of the star appearing in each movie. But not all his movies have star actors. His customers like to know each actor’s “real” birth name and date of birth. He tracks only actors who appear in the movies in our inventory.

He needs to keep track of what media each customer currently has checked out. A customer may check out multiple DVDs or tapes at any given time. Each time a customer rents a DVD and/or tape, they would like to keep the rental date/time and the return date/time. rentals are due back the next day, so we don’t need to keep a due date. Therefore, Group A needs another entity called Rental-history that has attributes like media-id, customer-id, rent date/time, return date/time, and order-id. Keeping this rental history will allow us to analyze the pattern of his rentals.

Database Design: Group A analyzes the application requirements and designs a database supporting the business processes of the application. As database designers, we need to store information in one place and the best place and follow the rules of normalization to achieve this project goal. The database design is divided into the following steps:

**2. Conceptual design**

a. Entity List

MOVIE

MEDIA

ACTOR\_MOVIE

**MEMBER**

RENTAL \_HISTORY

ACTOR

b. E-R Diagram

Diagram

Description automatically generated

c. Relationship to List:

Each MOVIE must be copied to one or more MEDIAs.

Each MEDIA must be a copy of one and only one MOVIE.

Each MEDIA may register in one or more RENTAL HISTORY.

Each RENTAL HISTORY must be registered by one and only one MEDIA.

Each RENTAL HISTORY must issue to one and only one MEMBER.

Each MEMBER may have one or more RENTAL HISTORY.

Each MOVIE may index to one or more ACTOR-MOVE.

Each ACTOR-MOVE must be indexed by one and only one MOVIE.

Each ACTOR must index to one or more ACTOR-MOVE.

Each ACTOR-MOVE must be indexed by one and only one ACTOR.

d. Relationship Matrix