

DATA MODEL

DVDSYS

Following requirements specification, the database design can commence.

The DBA will need to produce a *data model* to specify the data requirements of DVDSYS.

The data requirements are identified from the system requirements specification

- Use Case narratives

ER Diagram

The system requirements for DVDSYS have made reference to the following data stores:

- Rates file
- Genres file
- Age_Ratings file
- DVD file
- Member file
- Rental file

Data modelling requires the identification of the *data items* to be stored in each file.

Business rules must be considered carefully to ensure that the data model enables the rule to be implemented.

DVDSYS – Entities

- Rates
- Genres
- Age_Ratings
- DVD
- Member
- Rental

Entity: Rates

The Rates entity stores details about the nightly rental rates.

Different categories of DVD have different rental rates:

- New Release* €5.00
- Old Release* €3.50
- Childrens* €2.00

It would not be efficient to store this information as an attribute of the DVD entity i.e. in the DVD table. Why?

If a rate changes, then **every** record in the DVD table with that rate would need to be changed.

- It is more efficient to:
- Associate an identifier with each rate, stored in the **Rates table**
 - Associate each DVD with a rate.

If a rate changes, only the entry in the Rates table needs to be changed.

There is now three data items associated with a rate

NR - New Release €5.00
OR - Old Release €3.50
CH - Childrens €2.00

Give each data item a name:

Rate_Code Description Rate

NR - New Release €5.00
OR - Old Release €3.50
CH - Childrens €2.00

Show using ERD notation:

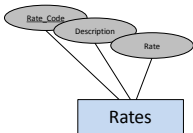


Table View

RATE_CODE	DESCRIPTION	RATE
NR	New Release	5.00
OR	Old Release	3.50
CH	Childrens	2.00

Entity: Age_Rating

Similarly, a DVD has a recommended age rating associated with it (18, PG, etc).

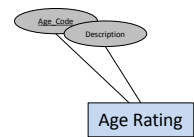
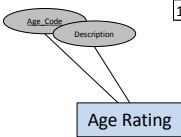


Table View

Age_Code	DESCRIPTION
18	Over 18
PG	Parental Guidance Recommended
U	Universal
12A	Over 12 with Adult



Entity: Genres

A DVD belongs to a specific genre (e.g. Thriller, Romance, Comedy, etc).

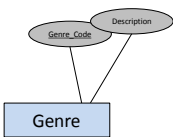
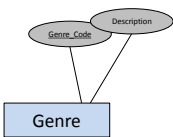


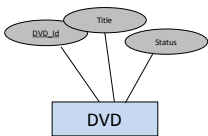
Table View

Genre_Code	DESCRIPTION
TH	Thriller
HR	Horror
RM	Romance
DM	Drama
DC	Documentary

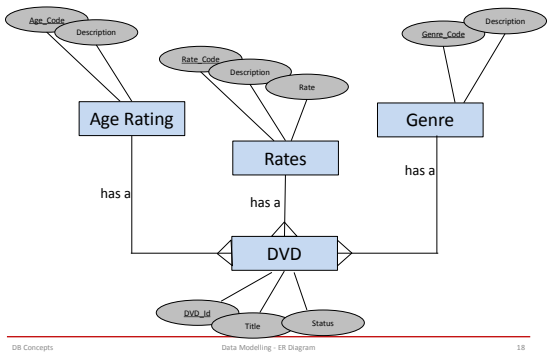


Entity: DVD

Requirements have identified the attributes shown below:

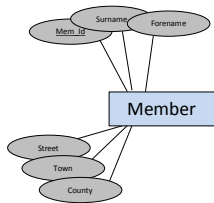


The ERD might now look like:

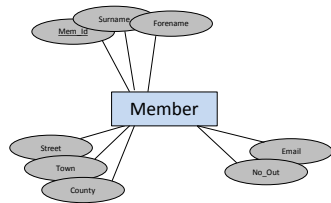


Entity: Member

Initial review of the requirements identifies the attributes shown below:

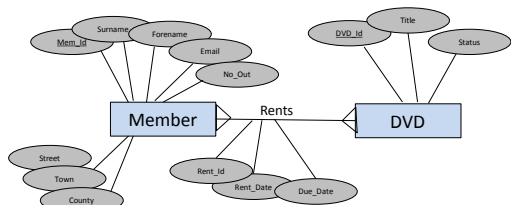


Subsequent review of business rules identifies further data requirements:

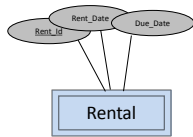


Member – DVD Relationship

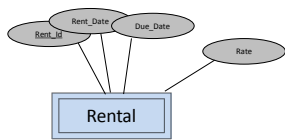
- A member rents many DVDs
- A DVD is rented by many members



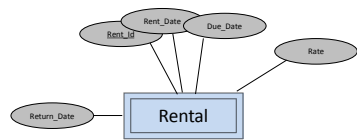
Many-to-many relationships are not supported by the Relational Data Model. A weak entity type **Rental** is therefore introduced:

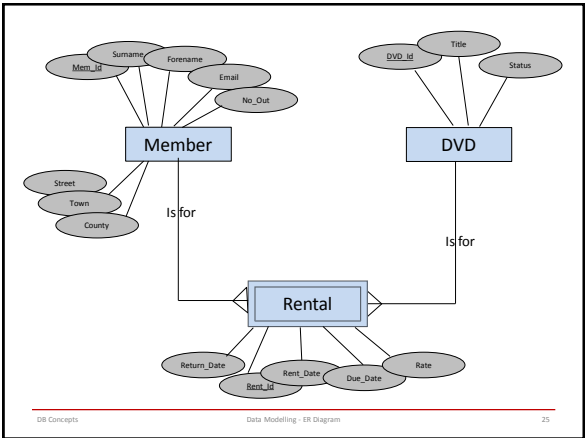


Rental rates may change.
Rate at time of rental must therefore be stored.



The system must determine if a rented DVD has been returned or if a DVD is overdue.





Refer to the hand out for the complete ERD for DVDSYS.

Consider each relationship to ensure that the following are correctly modelled:

- Cardinality
- Participation