Worked Example

Watch video: https://youtu.be/w-NHKN94g9A?t=55m27s

Worked Example

- ArtyDesigns is an art gallery in Cork city. The gallery promotes local young artists. Thus Mr. Black, the manager, would like to setup a database to store the data about his business.

- The name, address, contact number and date of birth of each young artist are recorded. For simplicity each artist is given an ID number.

- Each artwork is designed by one and only one artist but each artist will have many works in the gallery.

- Each artwork has a unique code, a title, a creation date and a price.

Worked Example

- The artwork is only a painting or a sculpture.
    - The paint media, i.e. Watercolours, Oils, and Charcoal is recorded for each painting as is the background type i.e. paper, canvas or silk.
    - A sculpture will record only the weight and the material of construction e.g. granite, stone or plaster.

Worked Example

- Twice a year the gallery holds a special gala night where it showcases some of the artwork. Only paintings are displayed here.

- Each gala has an Id, a theme, date and opening time.

- Each gala would be sponsored by at least one sponsor but may have more than one sponsor. Each sponsor will sponsor many galas.

- The ID, name, address, contact person and contact number of each sponsor is recorded.

Worked Example

- The minimum number of artworks displayed by the gala is eight and the maximum would be fourteen. Note each artwork would be displayed in one gala only. This is because artworks are usually sold during this event.

Worked Example

- **Step 1.1 Identify entities**

Worked Example

- **Step 1.1 Identify entities**
  - Artist
  - Artwork
  - Gala
  - Sponsor
- At this stage you could record the fact that artwork is a superclass and Sculpture and Painting are subclasses.

Worked Example

- **Step 1.2 Identify relationships**

Worked Example

- **Step 1.2 Identify relationships**
  - Each artwork is designed by one and only one artist but each artist will have many works in the gallery.
    - Artist 1..1 **designs** 1..* Artwork
- Each gala would be sponsored by at least one sponsor but may have more than one sponsor. Each sponsor will sponsor many galas.
  - Sponsor 1..* **sponsors** 1..* Gala

Worked Example

- **Step 1.2 Identify relationships**
    - The minimum number of artworks displayed by the gala is eight and the maximum would be fourteen. Note each artwork would be displayed in one gala only.
    - Gala 1..1 **displays** 8..14 Painting

Worked Example

- **Step 1.3 Identify and associate attributes with entities or relationships**

Worked Example

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- **Entity Type attributes:**
  - **Artist**: artistId, name (fName, lName), address (street, town, county), contactNumber, DOB
  - **Artwork**: artCode, title, creationDate, price
    - **Painting**: media, background
    - **Sculpture**: weight, material
  - **Gala**: galaId, theme, galaDate, openingTime
  - **Sponsor**: sponsorId, name, address (street, town, county), contactPerson (fName, lName), contactNumber

Worked Example

- **Step 1.4 Determine attribute domains**

- In the data dictionary record the allowable set of values for the attribute; and the size and format of the attribute.

Worked Example

- **Step 1.5 Determine candidate, primary, and alternate key attributes**

Worked Example

- **Step 1.5 Determine candidate, primary, and alternate key attributes**

  - **Artist**: Candidate keys: artistId, name and address, name and DOB, contactNumber
    Primary key: artistId

  - **Artwork**: Candidate key: artCode
    Primary key: artCode

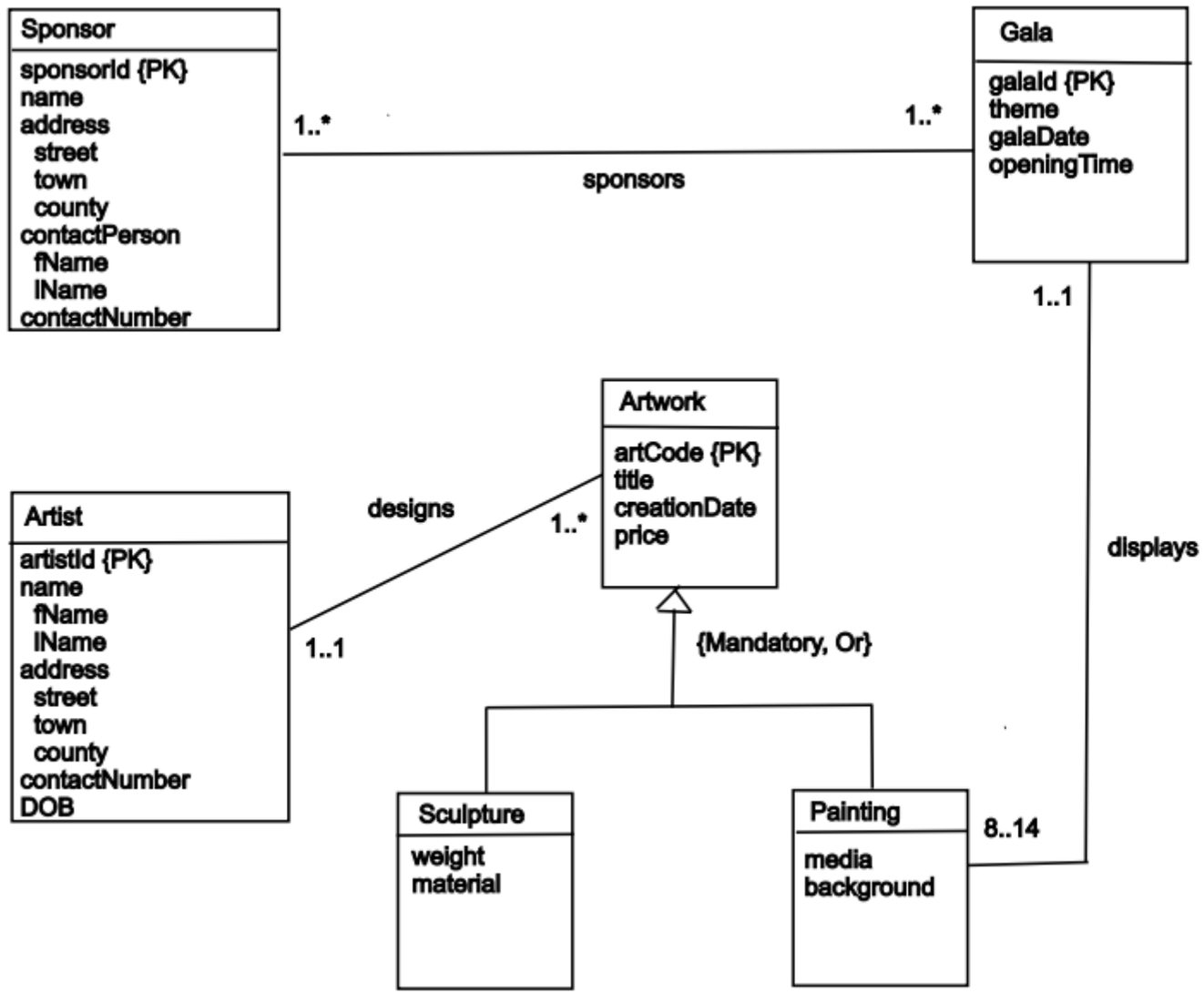
  - **Gala**: : Candidate key: galaId, them and galaDate
    Primary key: galaId

Worked Example

- **Step 1.5 Determine candidate, primary, and alternate key attributes**

  - **Sponsor** : Candidate keys: sponsorId, name and address, contactNumber
    Primary key: sponsorId

Worked Example



Worked Example

- **Step 2.1 Derive relations for logical data model**

- Firstly, we will map all the entity types to a set of relations:

Worked Example

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- Firstly, we will map all the entity types to a set of relations:

Artist(artistId, fName, lName, street, town, county, contactNumber, DOB
Primary key artistId

Gala(galaId, theme, galaDate, openingTime
Primary key galaId

Worked Example

Sponsor(sponsorId, name, street, town, county, fName, lName, contactNumber

Primary key sponsorId

- We must now map the superclass/subclass hierarchy between Artwork and (Sculpture and Painting).
- Because the Participation constraint is *Mandatory* and the Disjoint constraint is *Disjoint (Or)*, we will choose the option to map the superclass/subclass into one relation for each combined superclass/subclass.

Worked Example

Sculpture(artCode, title, creationDate, price, weight, material
Primary key artCode

Painting(artCode, title, creationDate, price, media, background
Primary key artCode

Worked Example

- Secondly, we will map the relationships:

Worked Example

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  Artist 1..1 **designs** 1..* Artwork

  Sculpture(artCode, title, creationDate, price, weight, material, artistId
  Primary key artCode
  Foreign key artistId references Artist(artistId)

  Painting(artCode, title, creationDate, price, media, background, artistId
  Primary key artCode
  Foreign key artistId references Artist(artistId)

Worked Example

Sponsor 1..* **sponsors** 1..* Gala

Sponsorship(sponsorId, galaId)
Primary key sponsorId, galaId
Foreign key sponsorId references Sponsor(sponsorId)
Foreign key galaId references Gala(galaId)

Worked Example

Gala 1..1 **displays** 8..14 Painting

Painting(artCode, title, creationDate, price, media, background, artistId, galaId
Primary key artCode
Foreign key artistId references Artist(artistId)
Foreign key galaId references Gala(galaId)

Worked Example

Full set of Tables

Artist(artistId, fName, lName, street, town, county, contactNumber, DOB)
Primary key artistId

Gala(galaId, theme, galaDate, openingTime)
Primary key galaId

Sponsor(sponsorId, name, street, town, county, fName, lName, contactNumber)
Primary key sponsorId

Worked Example

Sponsorship(sponsorId, galaId)
Primary key sponsorId, galaId
Foreign key sponsorId references Sponsor(sponsorId)
Foreign key galaId references Gala(galaId)

Sculpture(artCode, title, creationDate, price, weight, material, artistId)
Primary key artCode
Foreign key artistId references Artist(artistId)

Worked Example

Painting(artCode, title, creationDate, price, media, background, artistId, galaId)
Primary key artCode
Foreign key artistId references Artist(artistId)
Foreign key galaId references Gala(galaId)