

Gwent Card Marketplace Database Layer Design

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1 Entities in the System

The Gwent Marketplace system consists of the following entities:

- **User (Key Entity)**: Represents a registered user in the system.
Attributes: `userId` (PK), `username`, `email`, `password`, `birthdate`, `balance`.
- **CardTemplate (Key Entity)**: Describes the blueprint of a card.
Attributes: `templateId` (PK), `name`, `set`, `category`, `ability`, `flavor`, `rarity`, `faction`, `type`, `power`, `provision`, `imageUrl`, `factionUrl`.
- **Card (Weak Entity)**: Represents a specific instance of a card linked to a `CardTemplate`.
Attributes: `cardId` (PK), `templateId` (FK), `ownerId` (FK, nullable), `number`.
- **Transaction (associative Entity)**: Records the purchase and sale of cards between users.
Attributes: `transactionId` (PK), `buyerId` (FK), `sellerId` (FK), `cardId` (FK), `price`, `date`.
- **Listing (Weak Entity)**: Represents a card listing created by a user to sell cards.
Attributes: `listingId` (PK), `userId` (FK), `cardId` (FK), `price`, `status`.

2 Relationships Between Entities

- A **User** can own many **Cards** directly. (1:N)
- A **User** can create many **Listings**. (1:N)
- A **Listing** is for exactly one **Card**. (1:1)
- A **Transaction** links two **Users** (buyer and seller) with a single **Card**. (N:1)
- A **Card** references exactly one **CardTemplate**. (N:1)

- Each **CardTemplate** can be associated with many **Cards**, **Listings**, and **Transactions**. (1:N)

3 Cardinality and Ordinality

- One **User** can own zero or many **Cards** (0..N).
- One **Card** belongs to zero or one **User** (0..1).
- One **User** can create zero or many **Listings** (0..N).
- One **Listing** must be linked to exactly one **Card** (1..1).
- One **Transaction** involves exactly one buyer and one seller (1..1), and one card (1..1).

4 Attributes of Entities

- **Keys:** `userId`, `templateId`, `cardId`, `transactionId`, `listingId`.
- **Foreign Keys:** `templateId` in **Card**, `buyerId` and `sellerId` in **Transaction**, `userId` in **Listing**, `ownerId` in **Card**.
- **Multivalued Attributes:** A user can have multiple cards in their collection.

5 ER Diagram

The ER diagram is designed digitally with smartDraw.

