

# **Video Game Inventory Management System**

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# Project Description

As someone who loves videogames and expanding my game collection, I set out to create a database system that implements features existing in other game inventories, while being able to manage videogames in one place without searching for extra tools across the internet. I want users to automatically find the best deals on games on their wishlist, get recommendations for games based on their favorite genres, and be able to exchange games that they recently purchased, but didn't like, all in one place.

The Video Game Inventory Database will allow hosts to stock video games of various genres, platforms, and pricepoints. Users will be able to maintain, manage, and sort their own game collection, receive deals for making purchases from the host, see the best price of the game from among multiple vendors, refund and exchange games, and get recommended games based on their purchase/playing habits. If the host allows communication between users, users will be able to match with other users who have similar collections/playing habits.

Aside from just refunding them, users will be able to exchange games within a specific time period after purchase, possibly getting a better deal than refunding and buying a new game. They can also exchange a game on one platform for the same game on another platform. Additionally, using past sale history, users will be able to view the next expected sales and prices of a game in the future.

Some existing software products on the market that would benefit from this database system are Steam, Epic Games Store, and IsThereAnyDeal. Steam would benefit by allowing users to find games similar to their favorite games quickly and in an organized way. They could find out how the game is trending and when it is likely to be on sale. IsThereAnyDeal could incentivize users with games that they might personally like based on other similar users' favorite games. This would create a reason besides the price for a user to pick a particular product. The Epic Games Store would benefit by having forums, which would drive engagement from users who want to discuss their games. This could foster a community of discussion or users sharing creations for their favorite games through modding.

# Use Cases

Use Case Title:	Exchange games for more value
Actor(s):	Omar
Description:	<p>Omar is a student who has just returned to his dorm on the last day of the Fall semester. After studying and working on final projects for the last several weeks, he is excited to play the newest game by his favorite game studio, so he purchases it on a popular game marketplace and plays for a few hours. He quickly realizes how rushed the game's development was, since it is filled with bugs and glitches, but he wants to give it a shot since it was so anticipated.</p> <p>The next day, when he opens the game, he finds that all his progress has been deleted, and looking around on the internet, he discovers that data loss is one of the critical problems with the new release. When he tries to refund the clearly unplayable game, the marketplace notifies him of an option to exchange it for an older game with similar features, which would cost more if he refunded the new game instead of exchanging. After accepting this exchange, he finds that many of the new game's concepts were likely derived from this older game, which is actually polished and fun. Omar ends up spending the Winter break playing through and enjoying the higher quality game he received through the marketplace's exchange system.</p>

Use Case Title:	Predict Game Releases - Unsuccessful
Actor(s):	Jackie
Description:	<p>Jackie infrequently plays video games, and likes revisiting her old games instead of buying new ones. One day, she logs on to a website that tracks sale histories of games and is notified that DLC(downloadable content), or additional content, for an older game she owns is going to be released in a few days, since other DLCs for the game were released on that week the previous two years, celebrating the anniversary of its launch. The next week, after work, she hurries to her local game store to purchase the DLC, but is dismayed to find that it isn't at the store.</p> <p>Two months later, the DLC is released for purchase, since it has more content than the DLCs of the previous years. The website only used previous trends to project when it would release, but was inaccurate because it didn't account for an unexpected break in the trend.</p>

Use Case Title:	Exchange game platform
Actor(s):	Adrian
Description:	<p>Adrian likes playing a certain multiplayer game on his computer whenever he has free time. When his cousin graduates from high school, Adrian decides to give his PC away to help his cousin study, since he also has an old laptop and game console left.</p> <p>Unfortunately, his laptop is not powerful enough to run his favorite game, so Adrian is unsure how he is going to play it without buying it again for the console. When he checks the game in his collection in the digital game store from which he bought it, he sees a particular option to exchange the game's platform. After looking at the option in detail, he decides to exchange it and receives a download code for the game on his console. Due to this feature from the digital gamefront, Adrian can play his favorite game again without buying it twice, by exchanging the platform from PC to console.</p>

# Functional Requirements

## 1. User

- A user shall create at most one account
- A user shall have a unique tracking id
- A user, without an account, shall have zero games
- A user shall be able to view news sections
- A user shall be able to view news articles

## 2. Account

- An account shall be owned by one and only one user
- An account shall have an account id
- An account shall have a creation date
- An account shall have a state to define whether the account has been validated or not

## 3. Registered User

- A registered user is also a user
- A registered user has one account
- A registered user shall have at least one credit card payment method
- A registered user shall own many games
- A registered user shall have at most one favorite genre
- A registered user shall be able to purchase many bundles
- A registered user shall own many game collection subgroups
- A registered user shall have many friends, who are other registered users
- A registered user shall be a part of zero or one game party
- A registered user shall be a part of many game guilds
- A registered user shall be able to create many discussion posts
- A registered user shall be able to create many discussion posts

## 4. Game

- A game shall have a title
- A game shall have a unique id
- A game shall be owned by many registered users
- A game shall be grouped into at least one genre
- A game shall have many platforms
- A game shall be developed by one developer
- A game shall be published by one publisher
- A game shall be a part of many bundles

- A game shall be contained in many game collection subgroups
- A game shall be the focus of many game parties
- A game shall be sold in many marketplaces

#### 5. Genre

- A genre shall be categorizing many games
- A genre shall be the favorite of many registered users
- A genre shall be the specialty of many developers
- A genre shall be the specialty of many publishers
- A genre shall be the focus of zero or many bundles
- A genre shall be the focus of zero or many game collection subgroups

#### 6. Developer

- A developer shall focus on many genres
- A developer shall focus on many platforms
- A developer shall develop many games

#### 7. Publisher

- A publisher shall focus on many genres
- A publisher shall focus on many platforms
- A publisher shall publish many games

#### 8. Platform

- A platform shall have many games
- A platform shall be the focus of many developers
- A platform shall be the focus of many publishers
- A platform shall be the focus of many game parties
- A platform shall be the focus of many game guilds

#### 9. Bundle

- A bundle shall have many games
- A bundle shall focus on zero or one genres
- A bundle shall be bought by many registered users
- A bundle shall be sold in many marketplaces

#### 10. Game Collection Subgroup

- A game collection subgroup shall be owned by one and only one registered user
- A game collection subgroup shall contain many games
- A game collection subgroup shall focus on zero or one genres

## 12. Game Party

- A game party shall have many registered users
- A game party shall be associated with many games
- A game party shall be associated with many platforms
- A game party shall be associated with one and only one game guild

## 13. Game Guild

- A game guild shall have many registered users
- A game guild shall be associated with many platforms
- A game guild shall have zero or many game parties

## 14. Forum

- A forum shall have many discussion posts
- A forum shall be focused on many topics
- A forum shall have a name

## 15. Discussion Post

- A discussion post shall be focused on many topics
- A discussion post shall be a part of one and only one forum
- A discussion post shall be the parent of many discussion replies
- A discussion post shall be created by one and only one registered user
- A discussion post shall have a date

## 16. Discussion Reply

- A discussion reply shall be in the family of one and only one discussion post
- A discussion reply shall be the parent of many discussion replies
- A discussion reply shall be the child of one and only one discussion reply
- A discussion reply shall be created by one and only one registered user
- A discussion reply shall have a date

## 17. Marketplace

- A marketplace shall have many games
- A marketplace shall list the price of each game
- A marketplace shall have many bundles

## 18. News Section

- A news section shall have many news articles
- A news section shall be available for all users to view
- A news section shall have a state to define whether the user is registered or not



#### 19. News Article

- A news article shall belong to one and only one news section
- A news article shall be available for all users to view
- A news article shall be focused on many topics
- A news article shall have many authors

#### 20. Credit Card Payment Method

- A credit card payment method shall belong to one registered user
- A credit card payment method shall have one bank code
- A credit card payment method shall have one unique card number
- A credit card payment method shall have one expiration date
- A credit card payment method shall have one verification value (CVV or CVC)

# Non-Functional Requirements

## 1. Performance

- On a desktop browser, the main page of a website using the database system shall render its first content to the screen within 2 seconds.
- On a desktop browser, the main page of a website using the database system shall return the first byte of its response to a requested resource within 1.5 seconds.
- On a desktop browser, the main page of a website using the database system shall render its largest visible image, text block, or video element within 2.5 seconds.

## 2. Security

- Only encrypted passwords shall be supported by the database system.
- All registered users shall be required to pass multi-factor authentication checks when logging in to access an application/website that uses the database system.
- The database shall be automatically backed up every day at 11:59 pm.

## 3. Scalability

- The database system shall be able to handle a 50% increase in average concurrent users every 2 years.
- The database system shall be able to handle 1,000 more games than the previous year added each year to its marketplace.
- The database system shall be able to handle an average of 17% increase in game transactions every year.

## 4. Capability

- The database system shall have the capability to add games to a marketplace without disrupting the experience of current users.
- The database system shall have the capability to list how many players are currently in a game if it is linked to a game launcher.
- The database system shall have the capability to allow registered users to customize parts of their UI elements, and cater their marketplaces or news feeds through filters.

## 5. Environmental

- The database system shall be able to display a registered user's collection in an application without an internet connection.
- A marketplace using the database system shall be updated even if a user is not using its application or website.

- The database system will not allow a user to browse a forum if there is no internet connection.

#### 6. Coding Standard

- The database system shall have descriptive or clearly understandable names and identifiers.
- The database system shall not have abbreviations in names unless they are widely understood.
- The database system shall have names in the singular, not plural.

#### 7. Storage

- The database system should support persistent storage.
- The database shall hold space for 1000 different games by default in a marketplace utilizing it.
- The database shall have space for 20 games in the collection of each registered user by default.

#### 8. Privacy

- The database system shall prevent unregistered users from viewing the profile of registered users.
- The database system shall allow all users to view the prices of games between different vendors.
- The database system shall prevent unregistered users from accessing forums.