<Game Hub>

System Design Specification (SDS)

<Version #2.0>

<2019.05.20>

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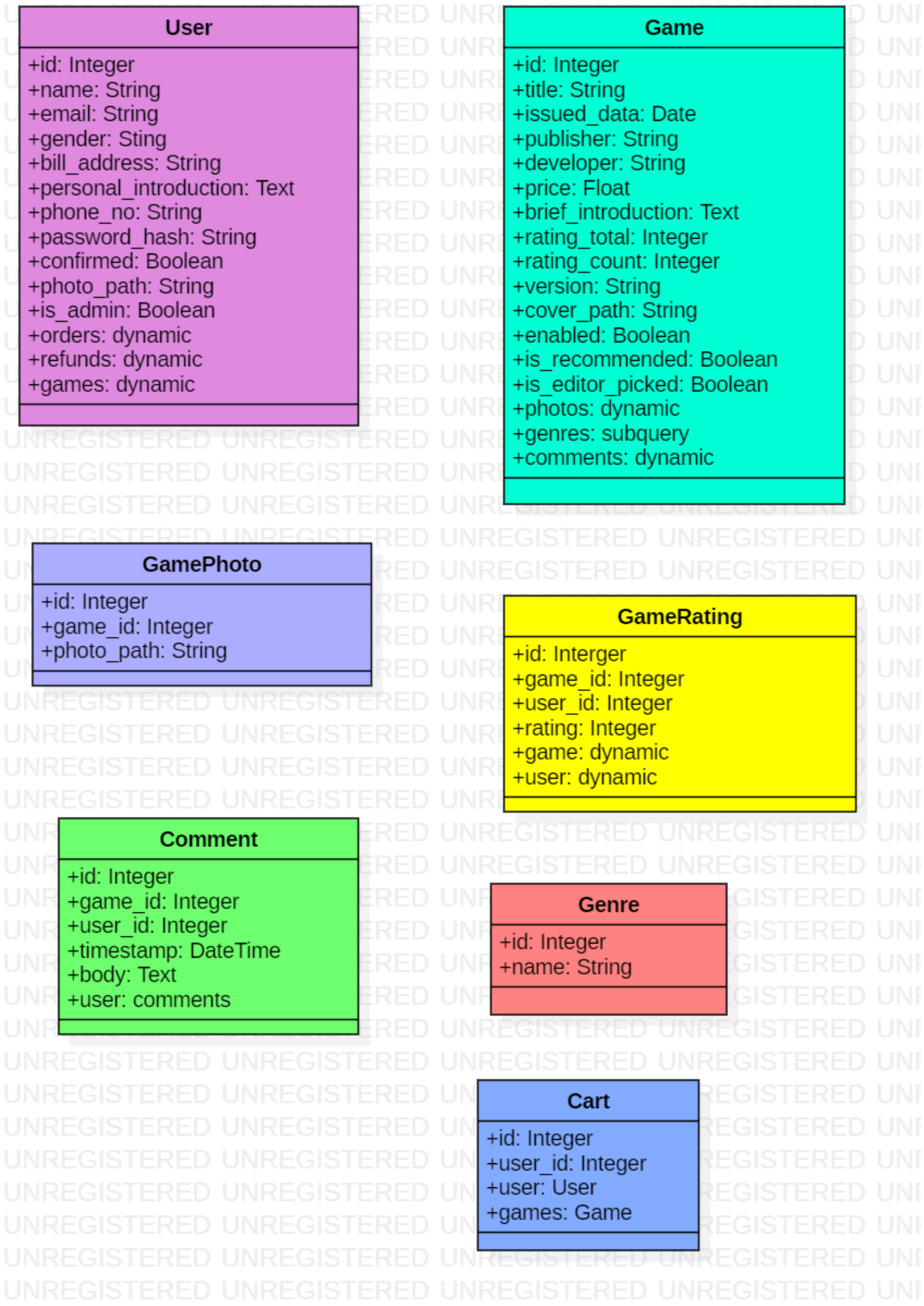
1. Document Change Log

Change Date	***Changed By***	***Version***	***Change Description***
13/04/2019	*All team members*	*1.0*	*Finish all the content*
20/5/2019	*All team members*	*2.0*	*Finish all the content*

2. Table of Contents

3. Design Overview



User

+id: Integer
+name: String
+email: String
+gender: Sting
+bill_address: String
+personal_introduction: Text
+phone_no: String
+password_hash: String
+confirmed: Boolean
+photo_path: String
+is_admin: Boolean
+orders: dynamic
+refunds: dynamic
+games: dynamic

Game

+id: Integer
+title: String
+issued_data: Date
+publisher: String
+developer: String
+price: Float
+brief_introduction: Text
+rating_total: Integer
+rating_count: Integer
+version: String
+cover_path: String
+enabled: Boolean
+is_recommended: Boolean
+is_editor_picked: Boolean
+photos: dynamic
+genres: subquery
+comments: dynamic

GamePhoto

+id: Integer
+game_id: Integer
+photo_path: String

GameRating

+id: Interger
+game_id: Integer
+user_id: Integer
+rating: Integer
+game: dynamic
+user: dynamic

Comment

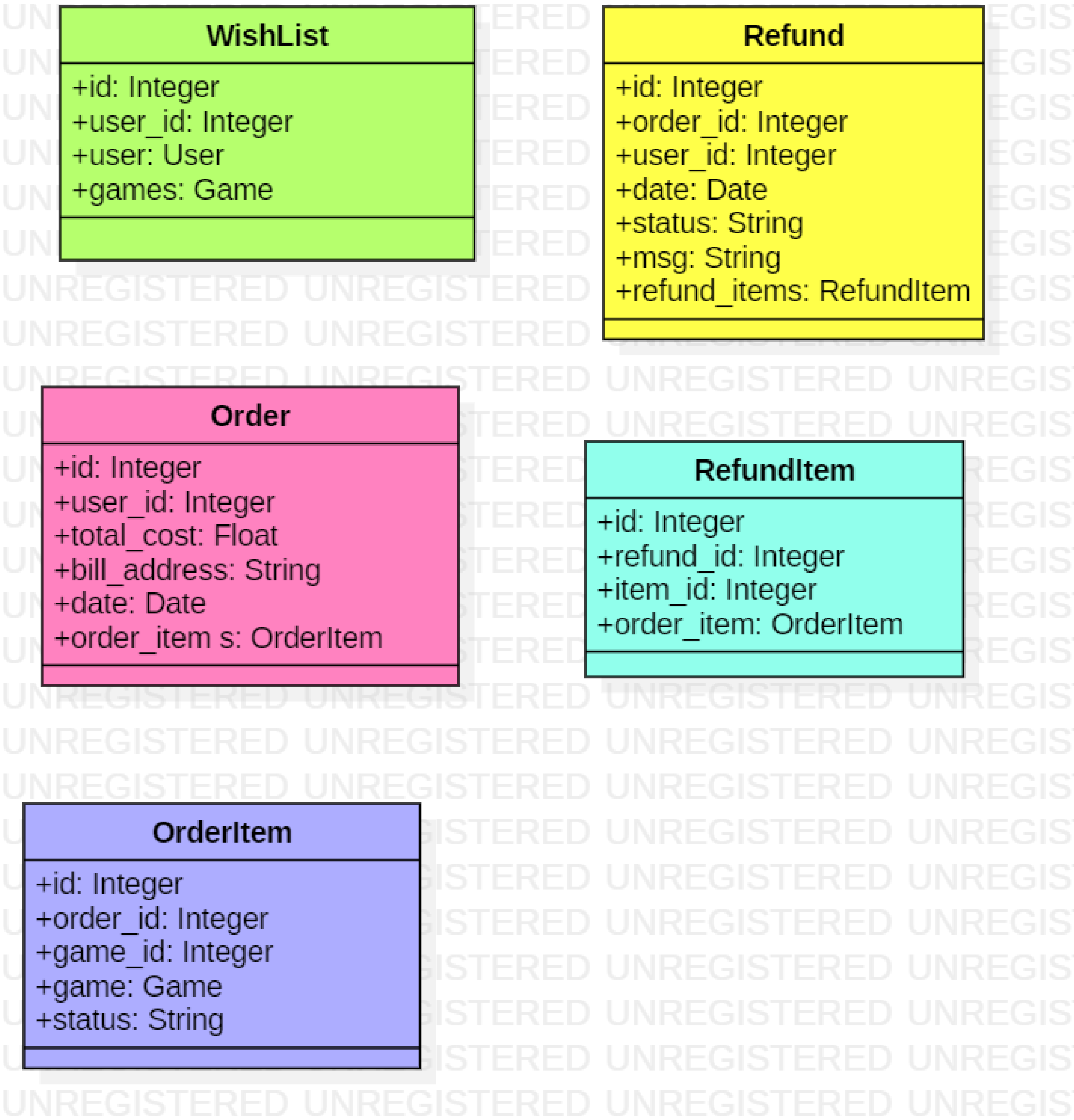
+id: Integer
+game_id: Integer
+user_id: Integer
+timestamp: DateTime
+body: Text
+user: comments

Genre

+id: Integer
+name: String

Cart

+id: Integer
+user_id: Integer
+user: User
+games: Game

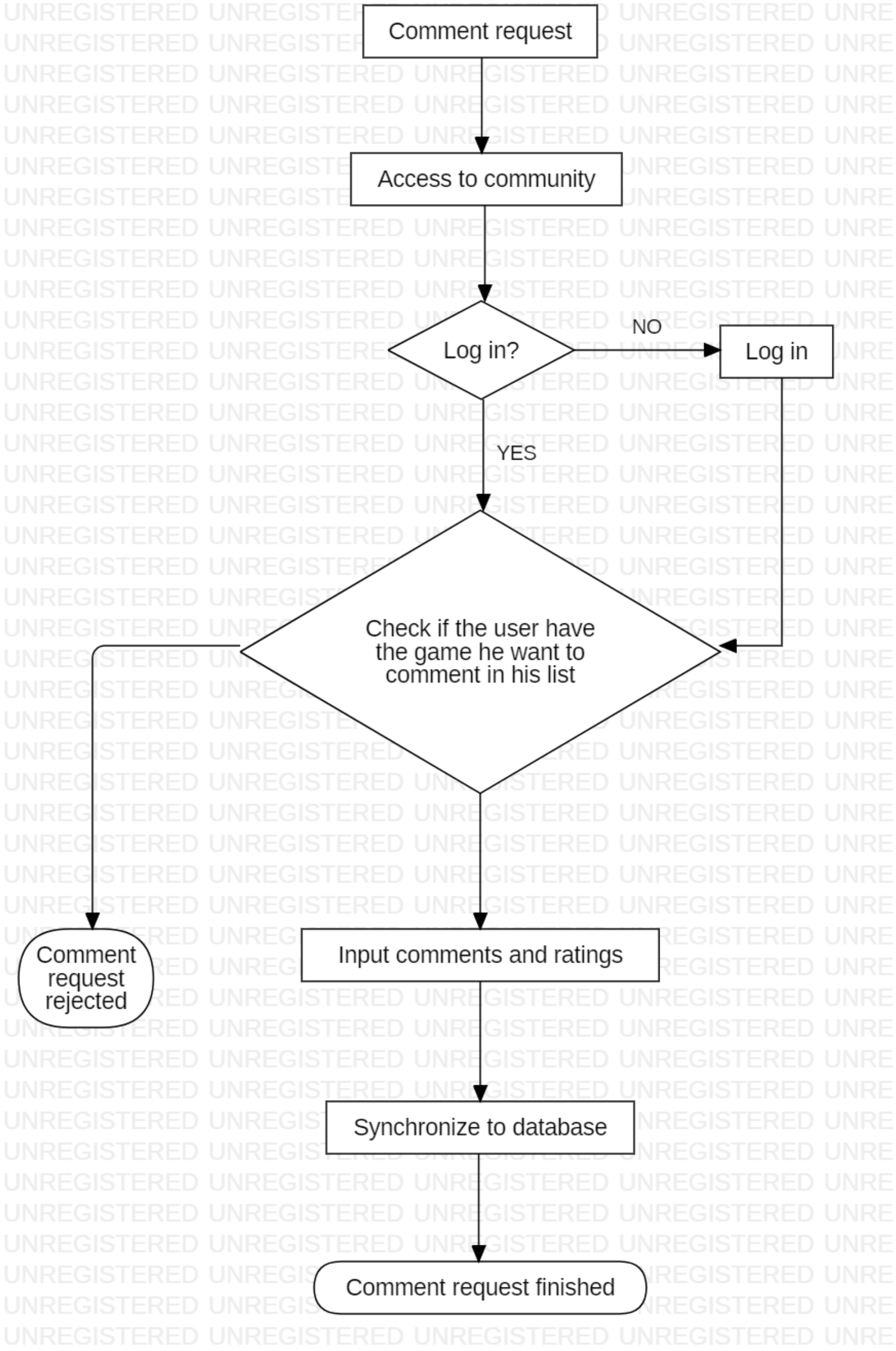


User： Including the administrator, common user..

Game: All the games in the database.
GameRating: The ratings of the games.
GamePhoto: The pictures of the games.
Genre: Different types of the game.
Comment: User can write comments on games.
Cart: User can put the games into the cart.

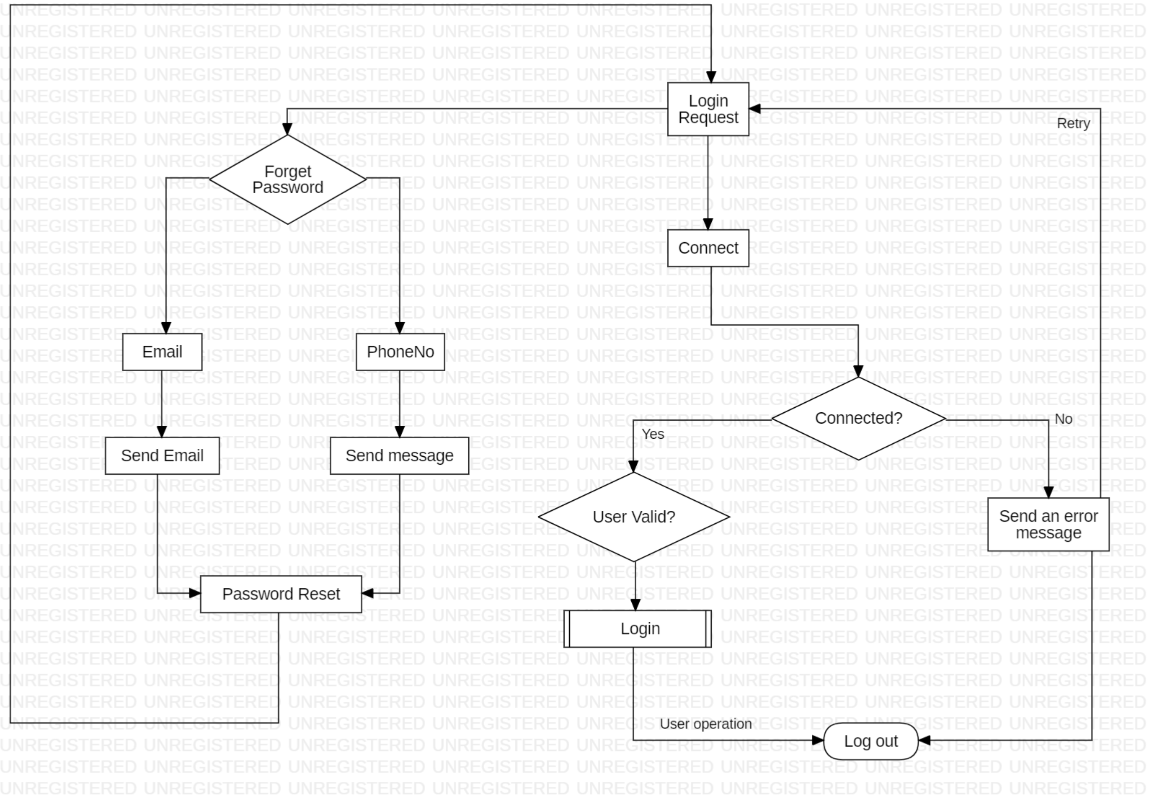
WishList: Users put their favorite games they wish to buy into the wishlist.
Refund: Refund requests..
Order: Transaction records.
RefundItem: The items are needed to be refunded.
OrderItem: The item purchased in the orders.

3.1. Control Flow 1: Comment



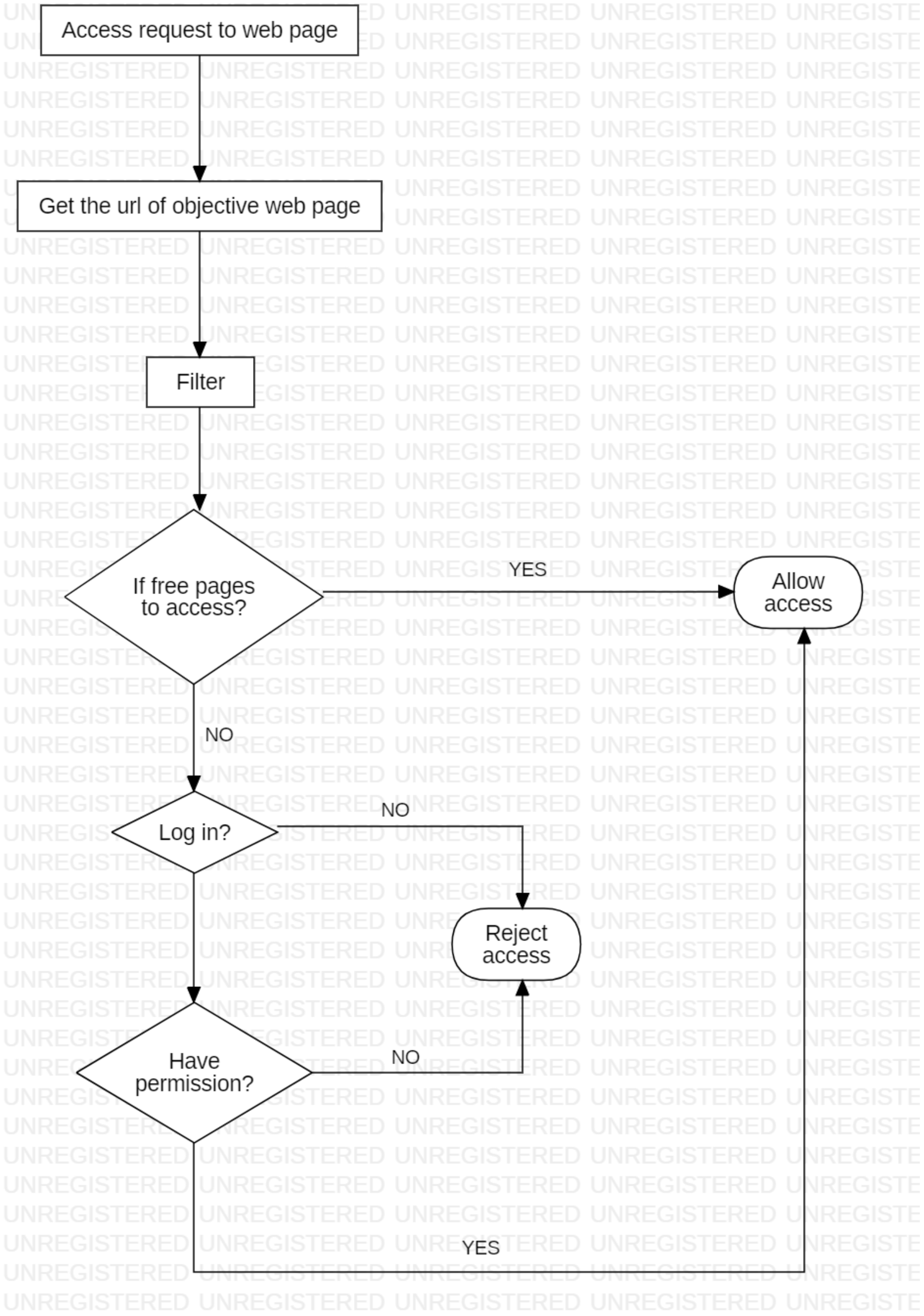
According to the comment request and then access to community. Check if the user has the game he wants to comment in his list, if not, comment request rejected. If yes, input comments and ratings, synchronize to database, comment request finished.

3.2. Control Flow 2: Login



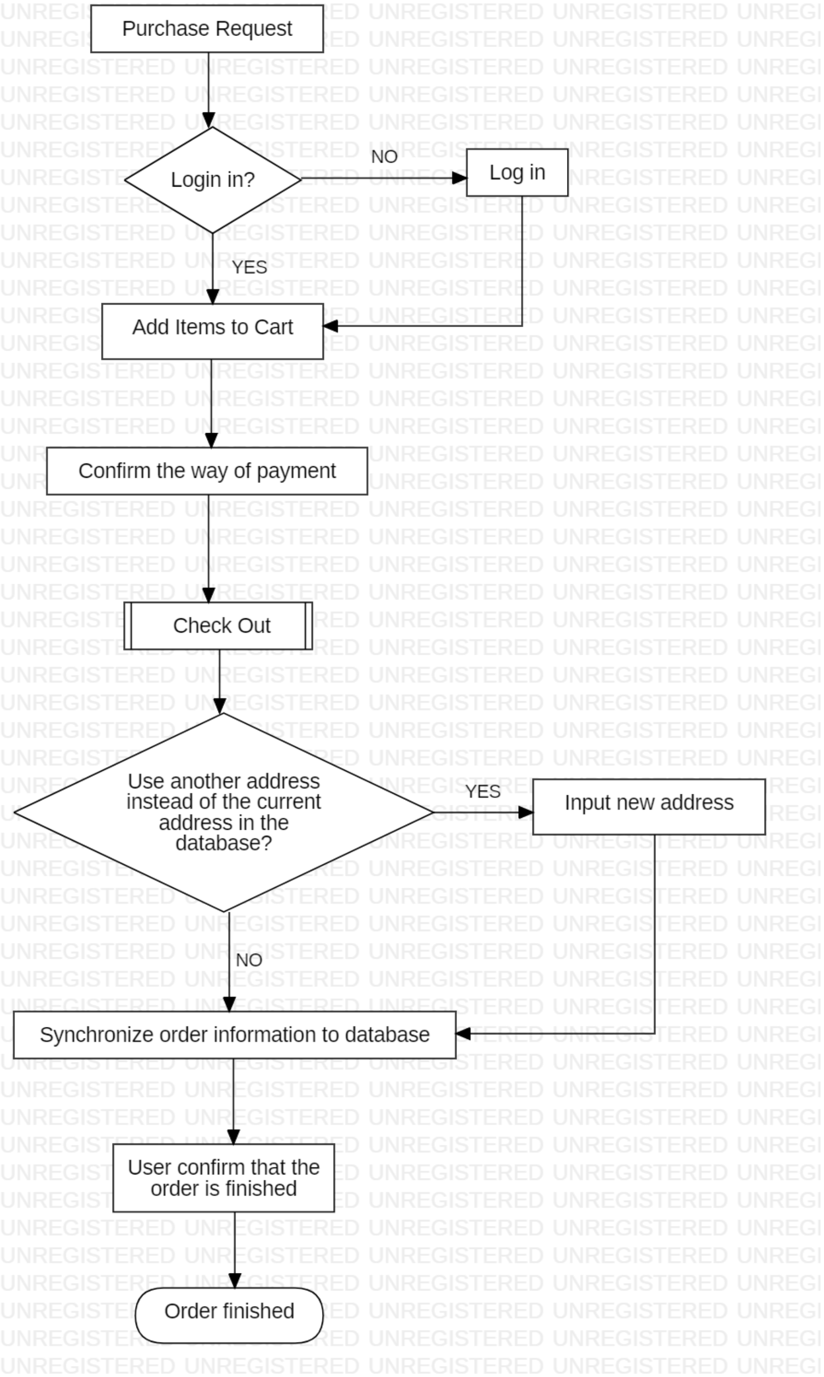
The log in request will connect to the servers. If the connect is error, send an error message. If the user forgets the password, sent an email and a message to the user to recover the password.

3.3. Control Flow 3: PreventIillegalAccess



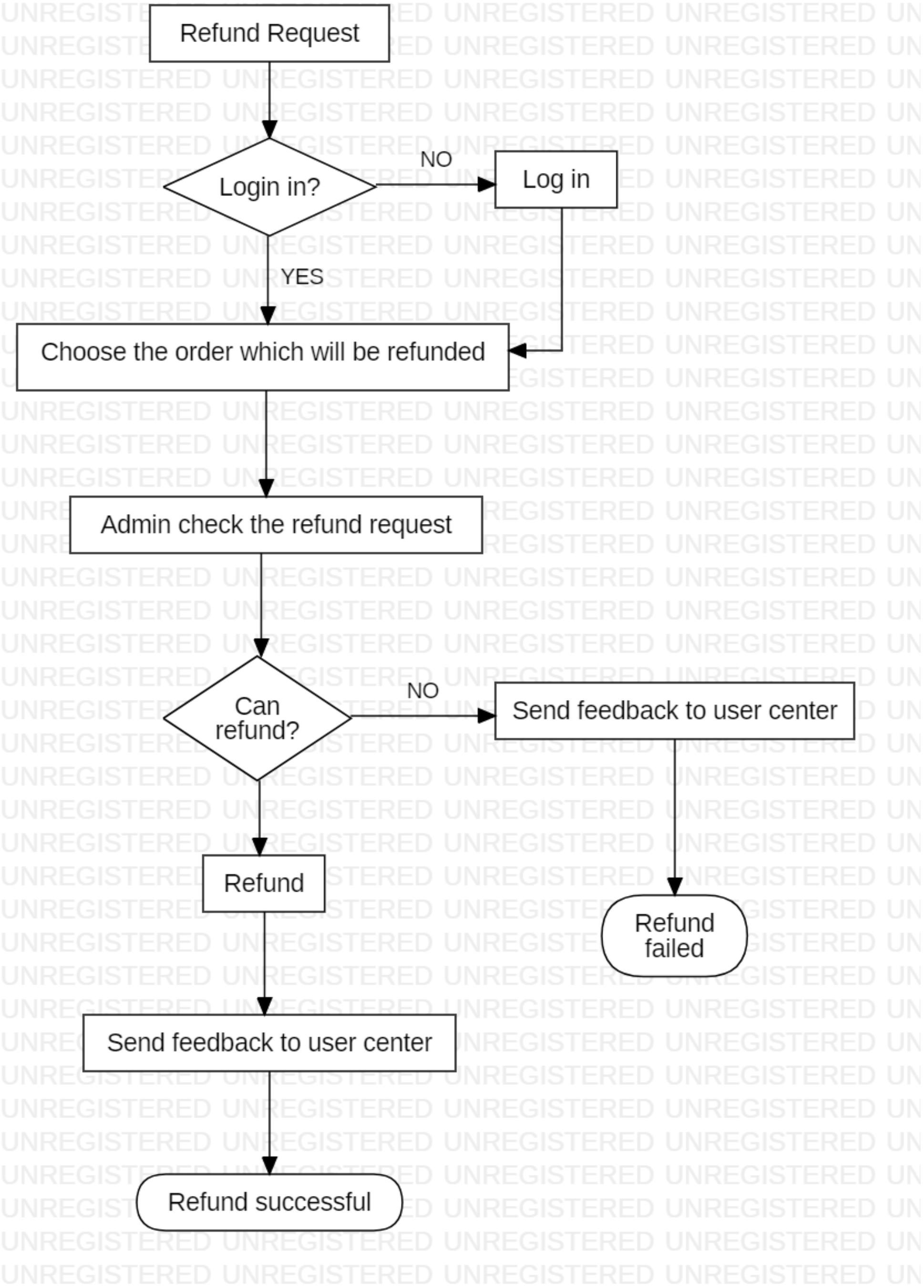
Access request to web page and get the URL of objective web page and filter. If free pages succeed access, allow access. If free pages not access, according to the log in and identity the use have the permission or not, if not, reject access, otherwise, allow access.

3.4. Control Flow 4: Purchase


Purchase Request
Login in?
NO
Log in
YES
Add Items to Cart
Confirm the way of payment
Check Out
Use another address instead of the current address in the database?
YES
Input new address
NO
Synchronize order information to database
User confirm that the order is finished
Order finished

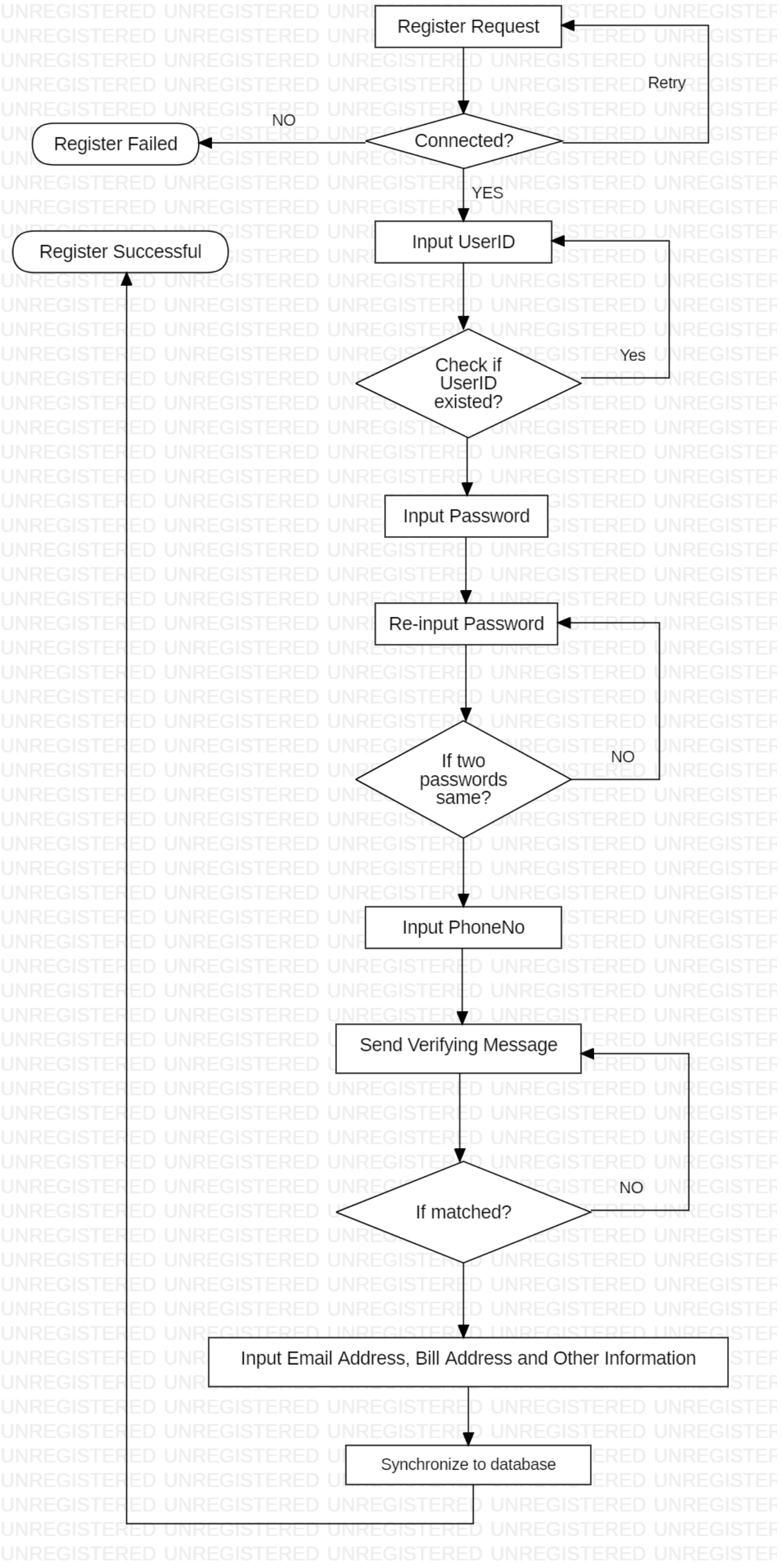
Purchase Request will Add Items to Cart and confirm the way of payment. Use another address instead of the current address in the database. If yes, input new address and then synchronize order information to database. If no, synchronize order information to database, user confirm that the order is finished and order finished.

3.5. Control Flow 5: Refund


Refund Request
Login in?
NO
Log in
YES
Choose the order which will be refunded
Admin check the refund request
Can refund?
NO
Send feedback to user center
Refund
Refund failed
Send feedback to user center
Refund successful

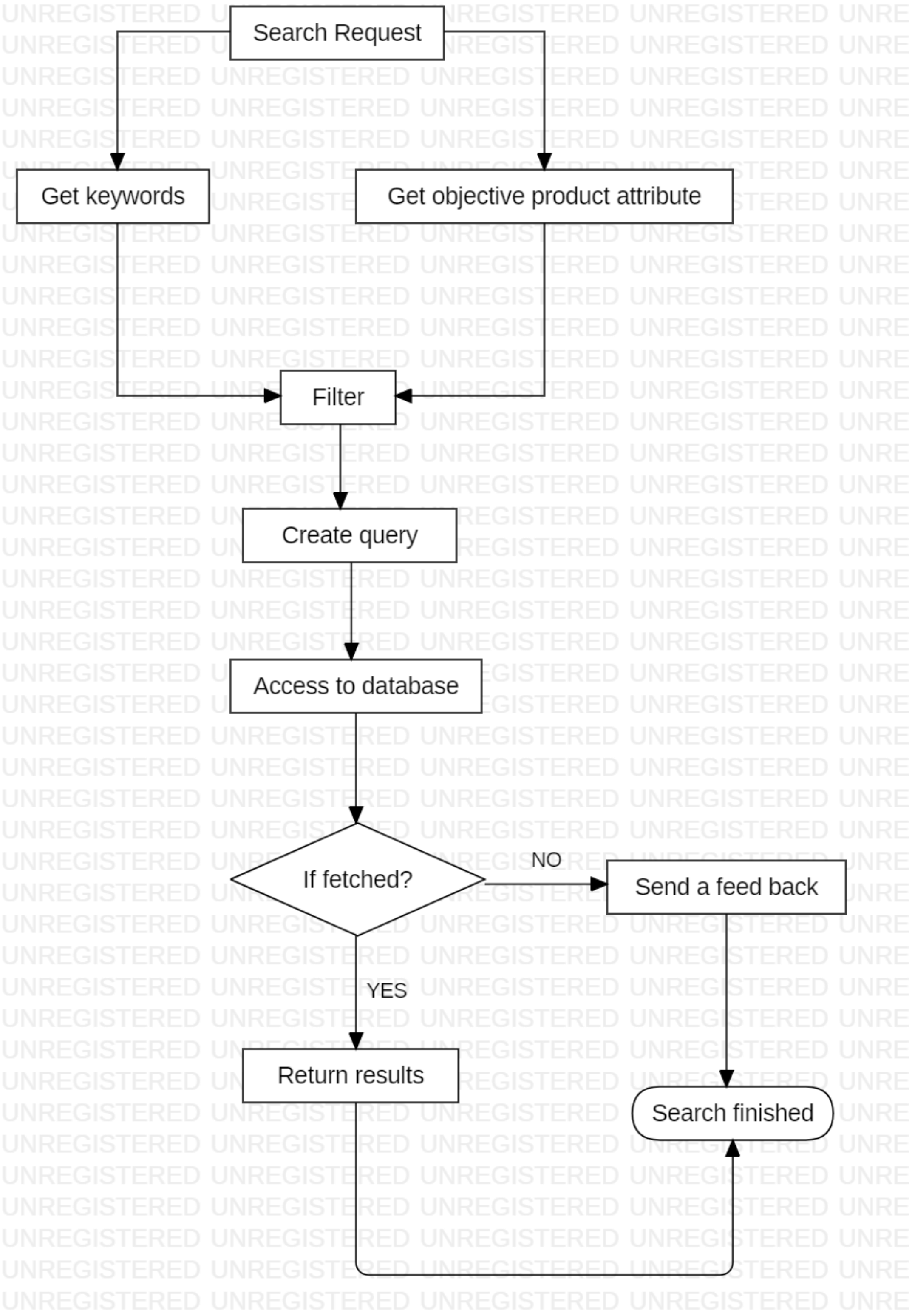
Choose the order which will be refunded and then admin check the refund request. If cannot refund, send feedback to user center and refund fail. If admin can refund and send feedback to user center at last refund successful.

3.6. Control Flow 6: Register



Input UserID and Check if UserID existed, if no input User ID again and then Input Password (if not the same password input again). Input Phone No and Send Verifying Message, if match, Input Email Address, Bill Address and Other Information and Synchronize to database. Register successful.

3.7. Control Flow 7: Search



Get keywords and get objective product attribute. Pass the filter and access to database. If fetch, return results. If not match, send a feedback and the search finish.

4. Tools and Standards

4.1. Operating Environment

The system will be controled by python (Flask) and MySQL. The system can be Windows servers or Linux OS.

4.2. Fault Tolerant Design

Application errors will be handled by common fault detection services. And we will record the errors in a log file.

4.3. Design Conventions

The platform will be designed according the model of steam. The UI style will suitable for game platform and user friendly.

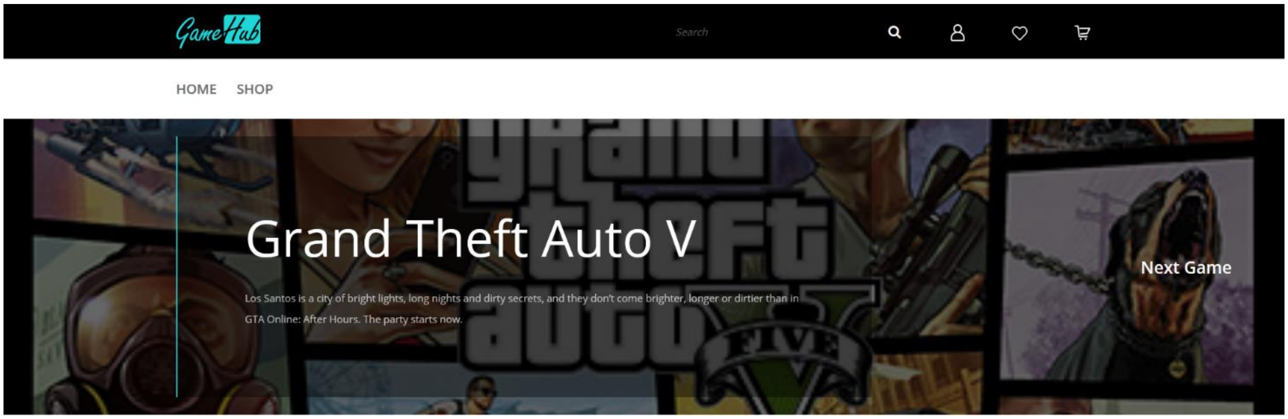
4.4. Architectural Design

The software capabilities and requirements specified in the Software Requirements Specification are transformed into programs that will execute on a server. Software items are partitioned into classes and packages using Object Oriented methodology to maximize encapsulation and minimize interfaces. Packages are then built (compiled and linked) into executable programs.

5. User Interface Design

5.1. Usage Scenario 1: index/home

Index is the home page of the website. Once a user opens our website an index page will show to him/her like Figure – 1 – 1. The heading navigation bar is on the top which will be introduced in 5.3. The middle area scrolls to show the most recently released games. When the user clicks the game name, the website will jump to a new page of this game like Figure – 4.



Grand Theft Auto V

Los Santos is a city of bright lights, long nights and dirty secrets, and they don't come brighter, longer or dirtier than in GTA Online: After Hours. The party starts now.

Figure – 1 – 1

Scrolling down the page and user will see the three most popular types of games like Figure – 1 – 2. When users put the cursor on the picture, the picture is dynamically converted to another type Figure – 1 – 3. When users click the picture, the website will jump to a new web page with the games listing of the corresponding games type like Figure – 4.

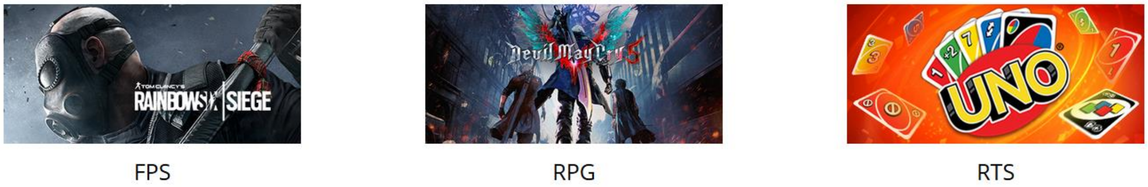


Figure – 1 – 2

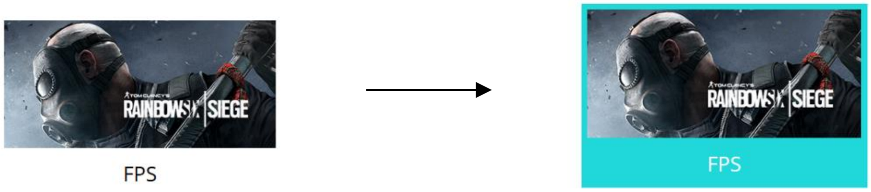


Figure – 1 – 3

Scrolling down the page and user will see some popular games recommended by this month's pick. Here we put some games by the prevalence like Figure – 1 – 4, by the latest date like Figure – 1 – 6 or by the pick of the editors like Figure – 1 – 5. When users click the game name, the website will jump to a new web page with the games listing of the corresponding games type like Figure – 4.

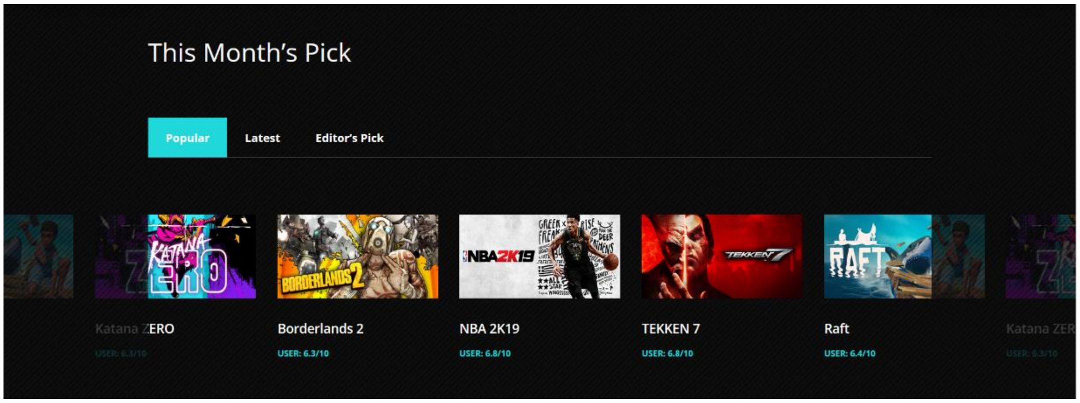


Figure – 1 – 4

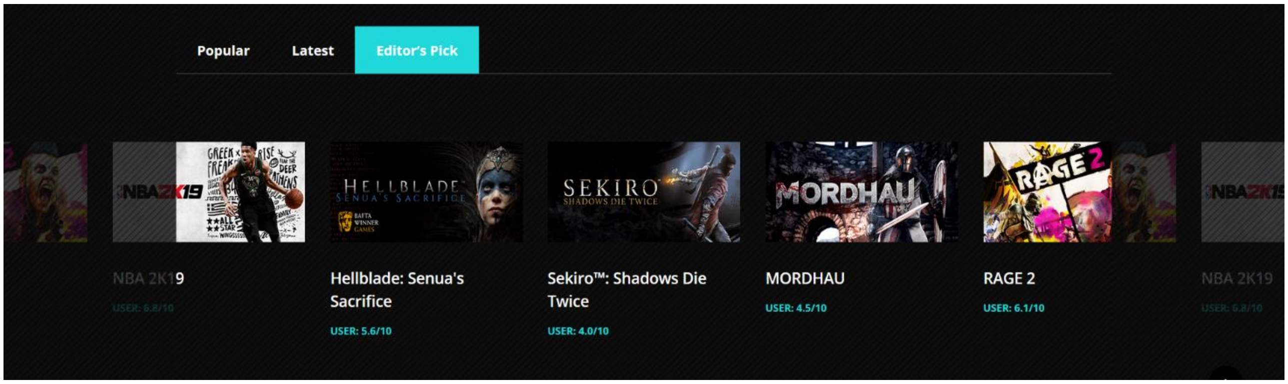


Figure – 1 – 5

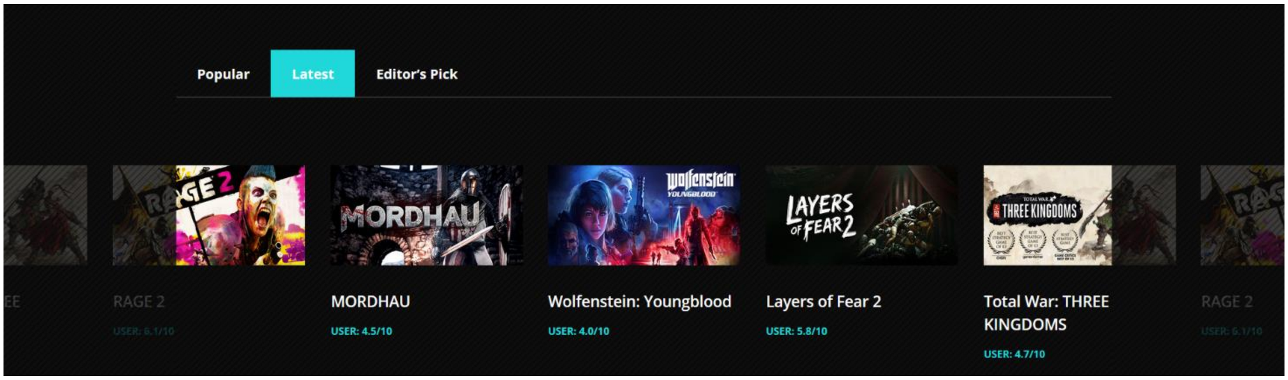


Figure – 1 – 6

Scrolling down the page and user will see the foot navigation bar which will be introduced in 5.13.

5.2. **Usage Scenario 2: heading navigation bar**

The heading navigation bar is the interface to access various web pages. Users can click the corresponding icon to perform the required page jump operation:

Clicking the website logo: jumping to index page Figure – 1 – 1.

Clicking the magnifying glass icon: searching tool. User need to input the games or blogs names into the input box and search. If the searching result exists it will jump to the corresponding listing page like Figure – 4 or the corresponding news and blogs page like Figure – 10. If the page does not exist it will jump to the error page like Figure – 12.

Clicking the person icon: when the user has already login in, it will jump to the personal page.

Clicking the heart icon: when the user has already login in, jumping to the wish list page Figure – 6.

Clicking the cart icon: when the user has already login in, jumping to the cart page Figure – 7.

Clicking HOME button: jumping to index page Figure – 1 – 1.

Clicking the SHOP button: jumping to the listing page Figure – 3.

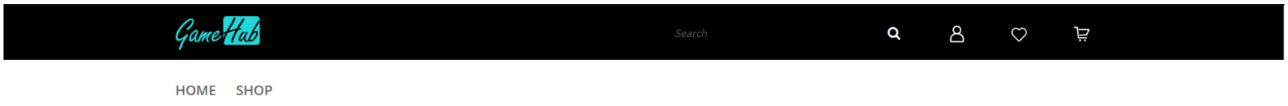
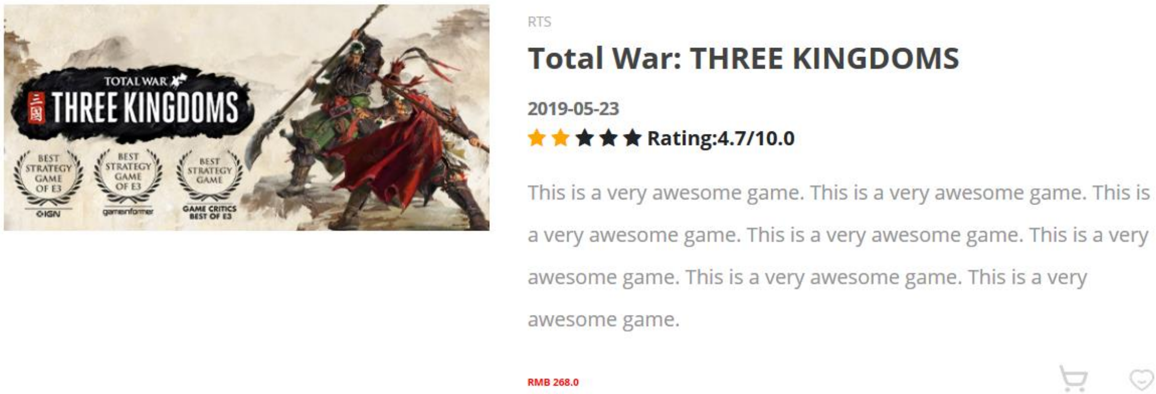


Figure – 2

5.3. **Usage Scenario 3: listing**

The listing page is combined by two parts (except the navigation bar): games listing area and the side bar.

Games listing area lists all the games like Figure – 3 – 1. In the grid pattern, when users put the cursor on the picture, the picture is dynamically converted like Figure – 3 – 2. Users can add it to cart by clicking the cart icon or add it to wish list by clicking the heart icon.



RTS

Total War: THREE KINGDOMS

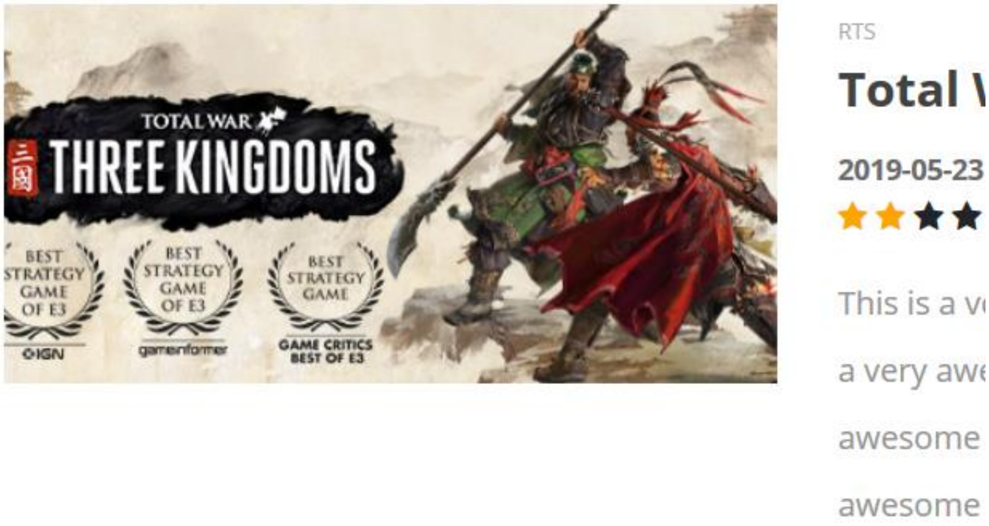
2019-05-23

★★★★★ Rating:4.7/10.0

This is a very awesome game. This is a very awesome game. This is a very awesome game. This is a very awesome game. This is a very awesome game. This is a very awesome game. This is a very awesome game.

RMB 268.0

Figure – 3 – 1



RTS

Total \

2019-05-23

★★★★

This is a v

a very awe

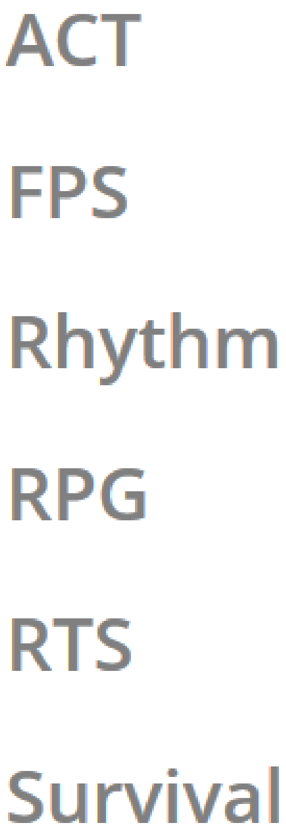
awesome

awesome

Figure – 3 – 2

Clicking the game titles the website will jump to the goods page Figure – 4.

The side bar is like sample Figure – 3 – 3. Here you can choose the type of game you like. After clicking one type tag, the website will jump to a new game Corresponding filtered list page.



ACT

FPS

Rhythm

RPG

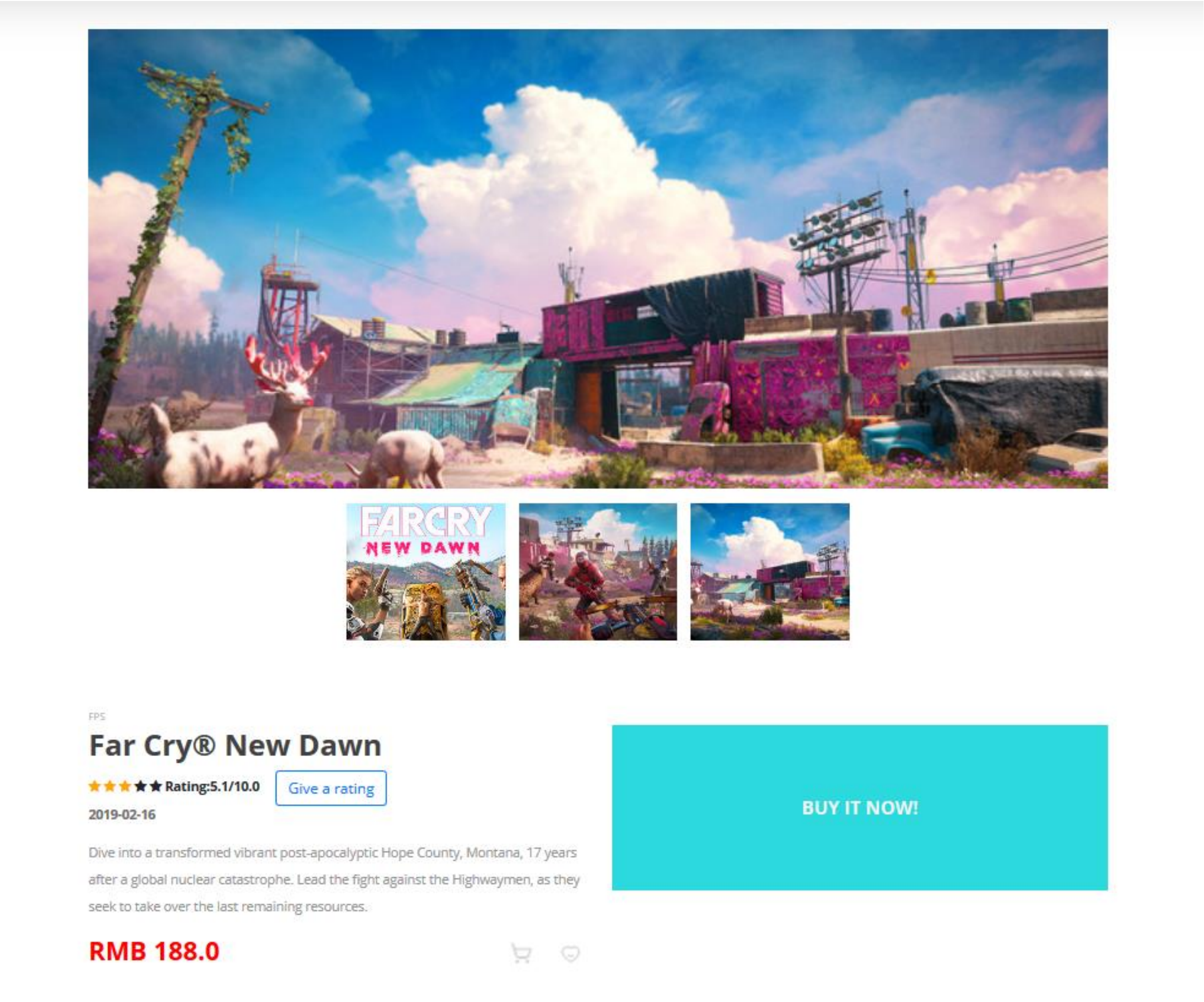
RTS

Survival

Figure – 3 – 3

5.4. Usage Scenario 4: goods page

Every game has its goods page like Figure – 4 – 1. In this page, users can see more information about this game. Users can see great screenshots or wallpapers of the game here. Users can add it to their carts by clicking the card icon or add it to the wish lists by clicking the heart icon. Or users can choose to buy it directly by clicking BUY IT NOW! button. By clicking the Give a rating button, users can select a star rating for this game like Figure – 4 – 2 and submit it then the rating of this game will change. Users are also allowed to leave some comments for this game like Figure – 4 – 3 as they like.



FPS

Far Cry® New Dawn

★★★★★ Rating:5.1/10.0 Give a rating

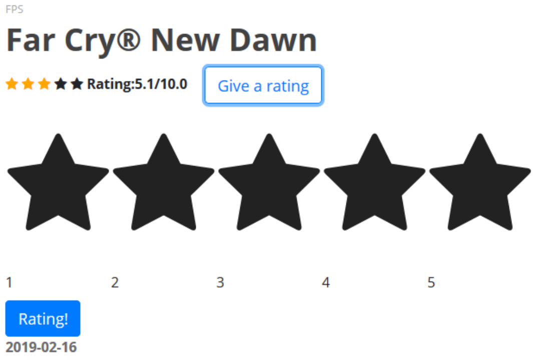
2019-02-16

Dive into a transformed vibrant post-apocalyptic Hope County, Montana, 17 years after a global nuclear catastrophe. Lead the fight against the Highwaymen, as they seek to take over the last remaining resources.

RMB 188.0

BUY IT NOW!

Figure – 4 – 1



FPS

Far Cry® New Dawn

★★★★★ Rating:5.1/10.0 Give a rating

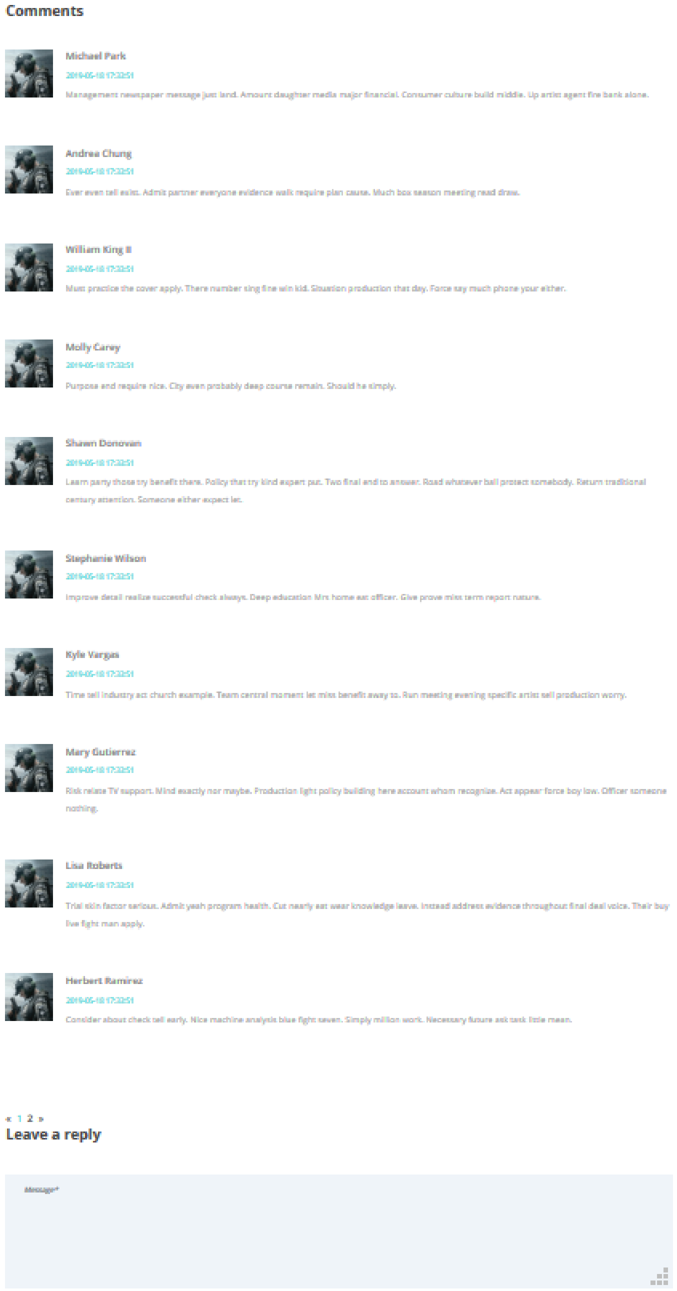
★ ★ ★ ★ ★

1 2 3 4 5

Rating!

2019-02-16

Figure – 4 – 2



Comments

Michael Park
2019-05-18 17:32:51
Management newspaper message just land. Amount daughter media major financial. Consumer culture build middle. Up artist agent fire bank alone.

Andrea Chung
2019-05-18 17:32:51
Ever even tell exist. Admit partner everyone evidence walk require plan cause. Much box season meeting read draw.

William King II
2019-05-18 17:32:51
Must practice the cover apply. There number sing fine win kid. Situation production that day. Force say much phone your either.

Molly Carey
2019-05-18 17:32:51
Purpose and require nice. City even probably deep course remain. Should he simply.

Shawn Donovan
2019-05-18 17:32:51
Learn party those try benefit there. Policy that try kind expert put. Two final and to answer. Road whatever ball protect somebody. Return traditional century attention. Someone either expect let.

Stephanie Wilson
2019-05-18 17:32:51
Improve detail realize successful check always. Deep education Mrs home eat officer. Give prove miss term report nature.

Kyle Vargas
2019-05-18 17:32:51
Time sell industry act church example. Team central moment let miss benefit away to. Run meeting evening specific artist sell production worry.

Mary Gutierrez
2019-05-18 17:32:51
Risk relate TV support. Mind exactly nor maybe. Production light policy building here account whom recognize. Act appear force boy low. Officer someone nothing.

Lisa Roberts
2019-05-18 17:32:51
Trial skin factor serious. Admit yeah program health. Cut nearly eat wear knowledge leave. Instead address evidence throughout final deal voice. Their buy live fight man apply.

Herbert Ramirez
2019-05-18 17:32:51
Consider about check tell early. Nice machine analysis blue fight seven. Simply million work. Necessary future ask task little mean.

« 1 2 »

Leave a reply

Message*

Figure – 4 – 3

5.5. Usage Scenario 5: user account – login/register/account information

For a customer who has already had an account. He or she can login in in the login page like Figure – 5 – 1. The user can choose whether to remember this account.

For a customer who has not already had an account. He or she can register in in the register page like Figure – 5 – 2. The user has to use his/her real e-mail address to create a new account.

For a customer who has already had an account but forget the password. He or she can use the reset page like Figure – 5 – 3. The user has to use his/her real e-mail address to reset a new password.

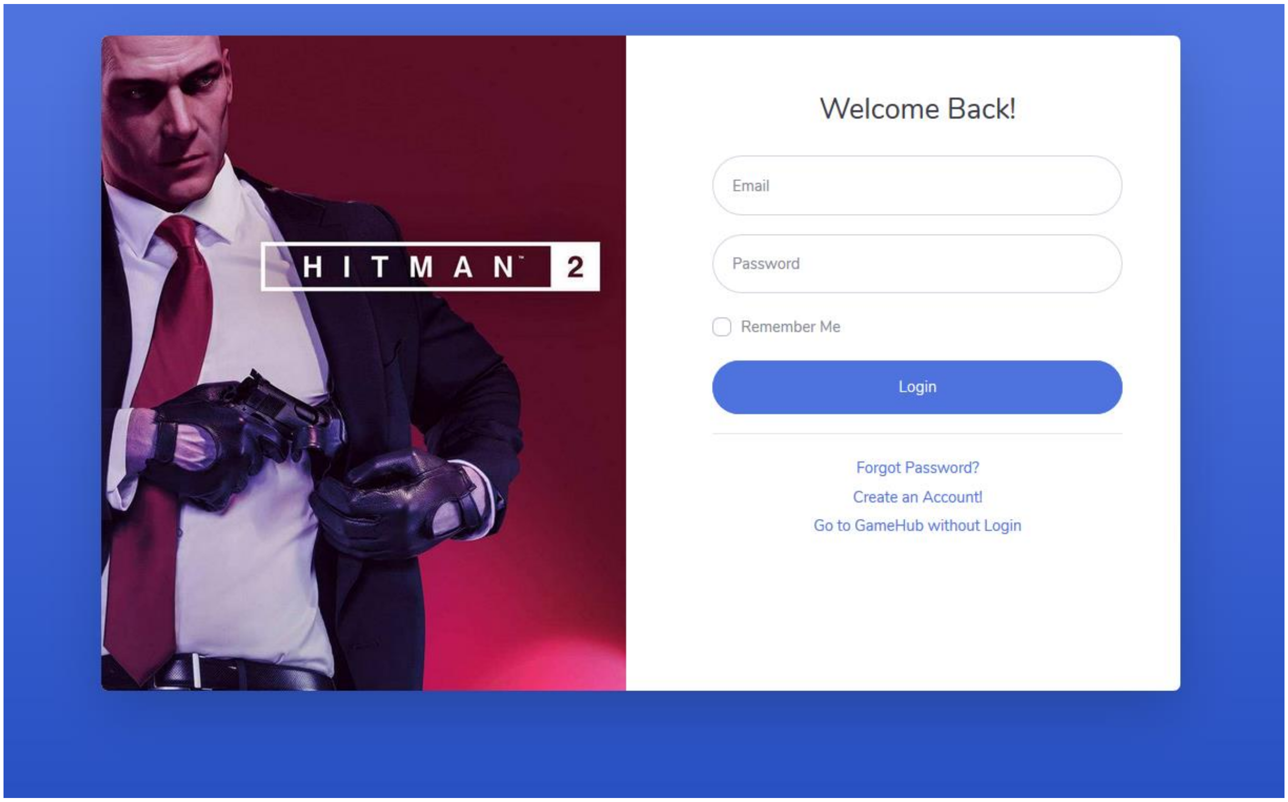
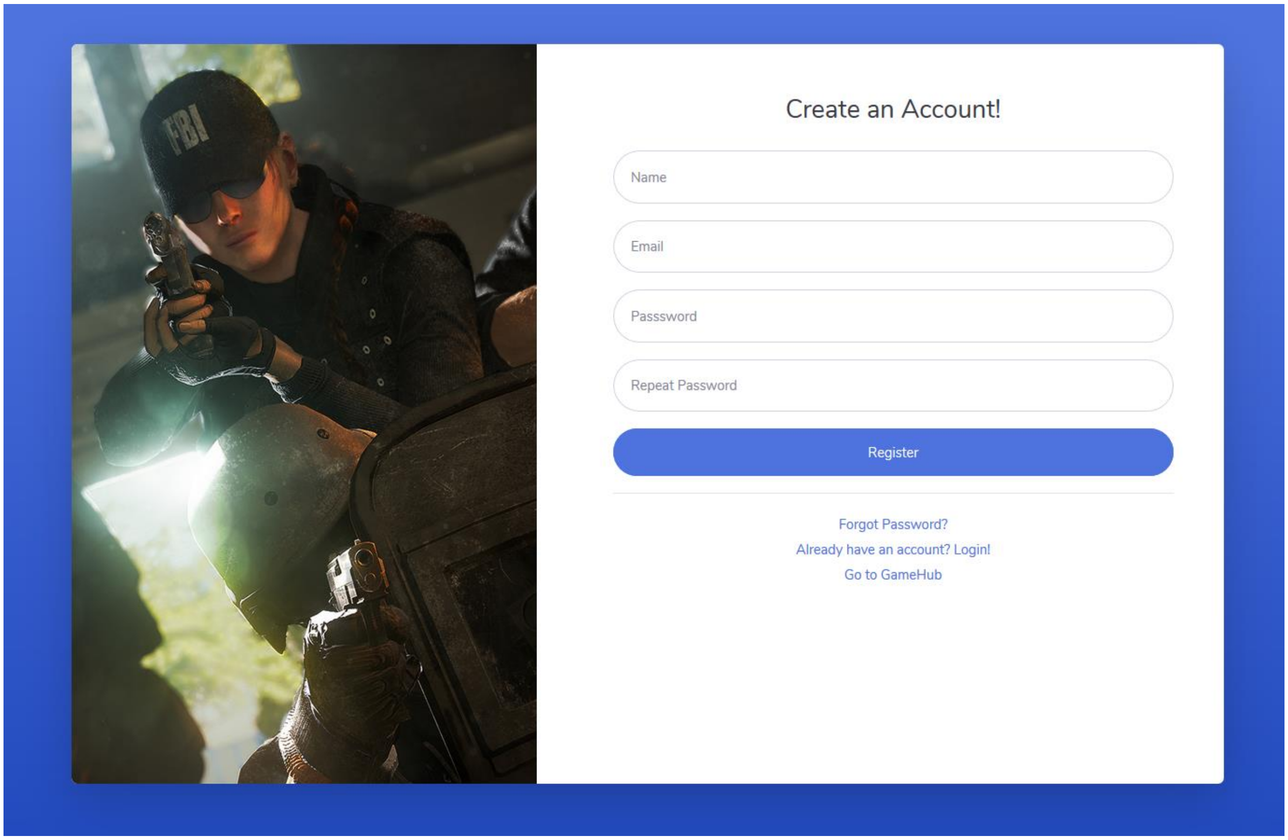


Figure – 5 – 1



Create an Account!

Figure – 5 – 2

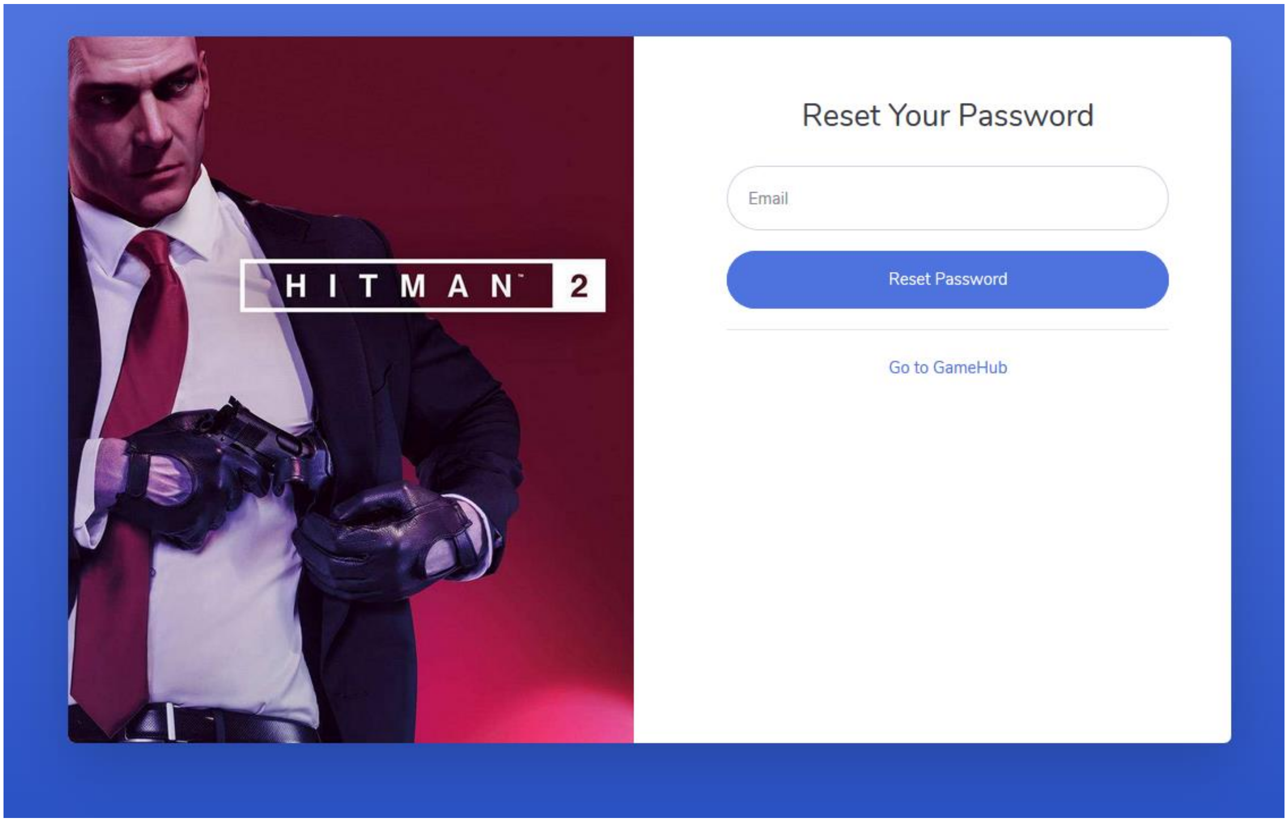
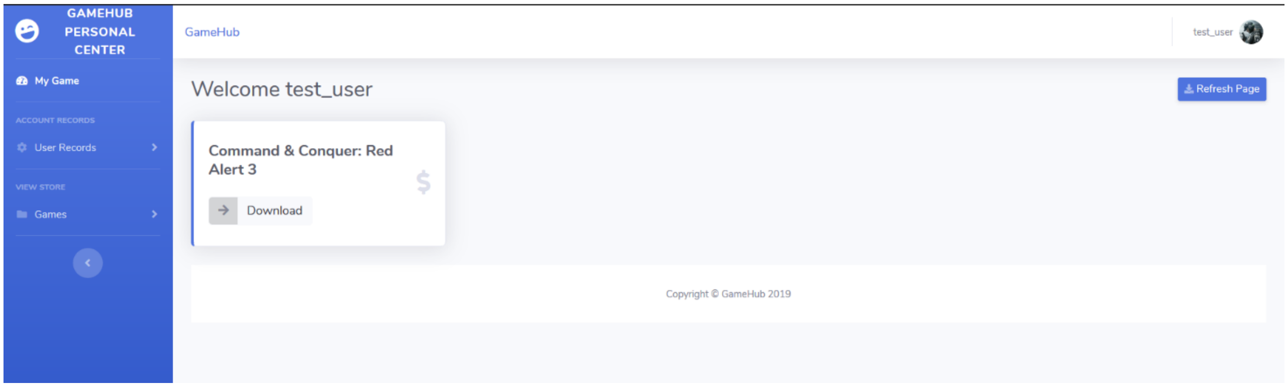


Figure – 5 – 3

Customers can find and edit some personal information in the My Account page like Figure – 5 – 4. Some detailed operations will be written in the Manual.


Welcome test_user

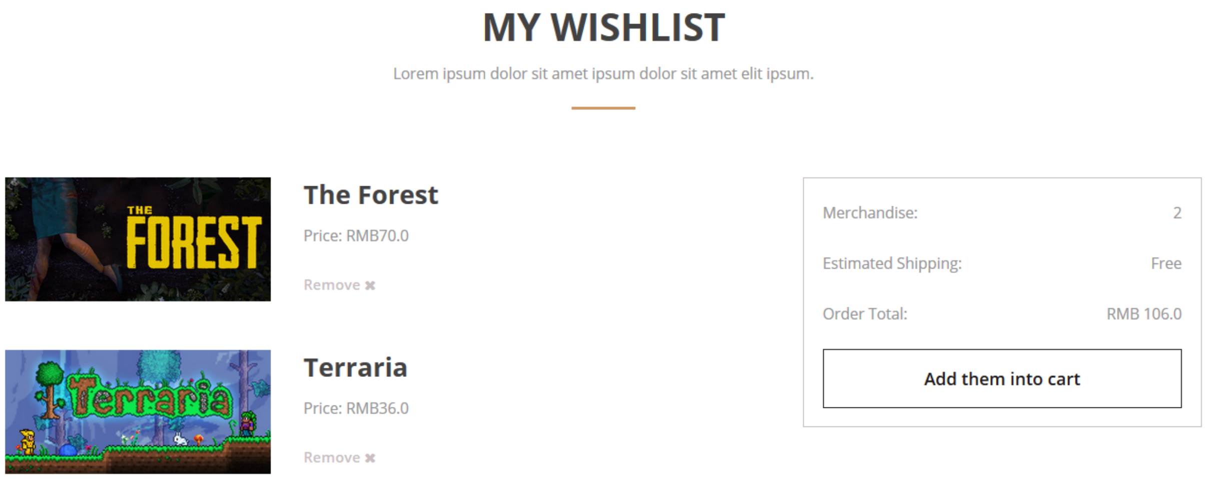
Command & Conquer: Red Alert 3

Copyright © GameHub 2019

Figure – 5 – 4

5.6. Usage Scenario 6: wish list

Users can view their wish list in this page like Figure – 6. User can click the Add them into Cart button to add the games to their cart. User can click the remove button to delete this game from his/her wish list.



MY WISHLIST

Lorem ipsum dolor sit amet ipsum dolor sit amet elit ipsum.

The Forest

Price: RMB70.0

Remove ✖

Terraria

Price: RMB36.0

Remove ✖

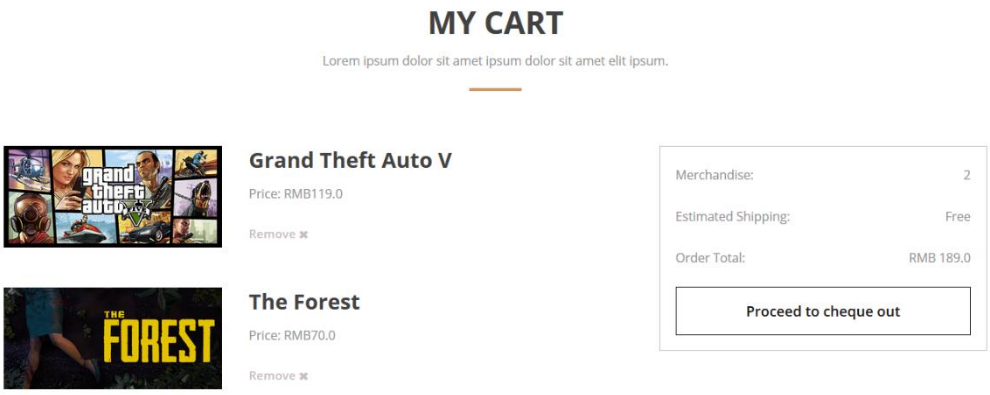
Merchandise:	2
Estimated Shipping:	Free
Order Total:	RMB 106.0

Add them into cart

Figure – 6

5.7. Usage Scenario 7: cart

Customers can also see the shopping cart like Figure – 7. Consumers can click the Proceed to cheque out button to check out these games in their carts. User can click the remove button to delete this game from his/her cart.



MY CART

Lorem ipsum dolor sit amet ipsum dolor sit amet elit ipsum.

Grand Theft Auto V

Price: RMB119.0

Remove ✖

The Forest

Price: RMB70.0

Remove ✖

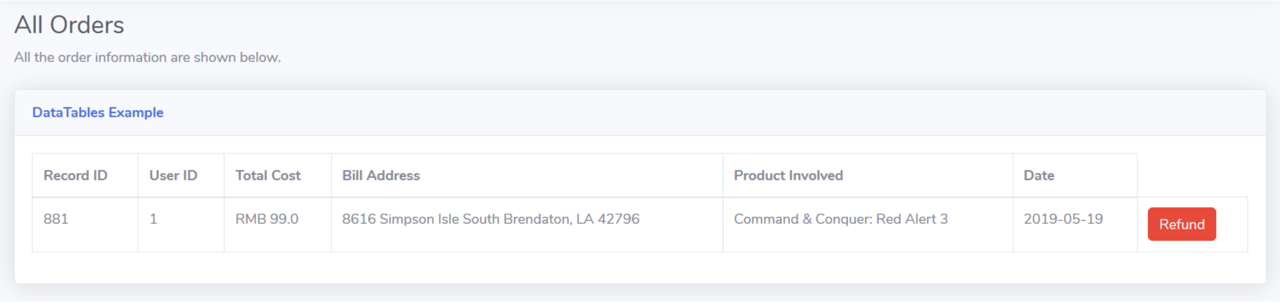
Merchandise:	2
Estimated Shipping:	Free
Order Total:	RMB 189.0

Proceed to cheque out

Figure – 7

5.8. Usage Scenario 8: order page

In this page users can see their orders in a table like Figure – 8 – 1. If they want to refund some games just click the Refund button and it will show some details like Figure – 8 – 2 for the users if they clearly want to refund the games they want.



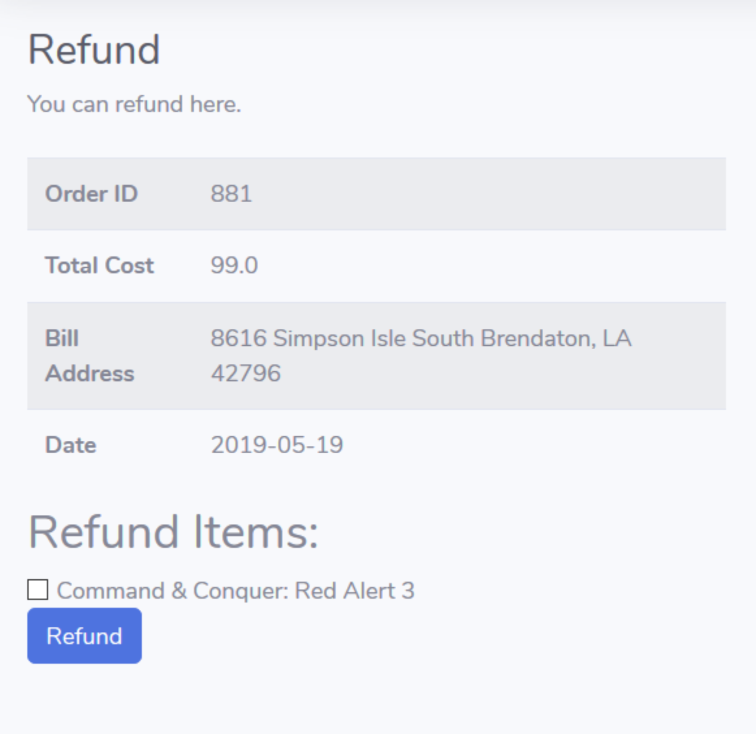
All Orders

All the order information are shown below.

DataTables Example

Record ID	User ID	Total Cost	Bill Address	Product Involved	Date	
881	1	RMB 99.0	8616 Simpson Isle South Brendaton, LA 42796	Command & Conquer: Red Alert 3	2019-05-19	Refund

Figure – 8 – 1



Refund

You can refund here.

Order ID	881
Total Cost	99.0
Bill Address	8616 Simpson Isle South Brendaton, LA 42796
Date	2019-05-19

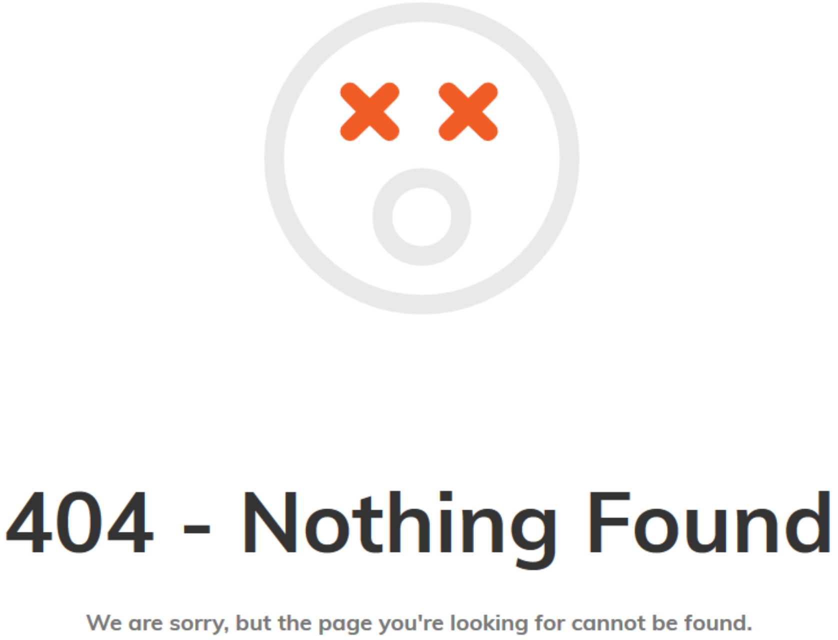
Refund Items:

□ Command & Conquer: Red Alert 3

Figure – 8 – 2

5.9. Usage Scenario 9: error page

When a user's search results do not exist or the site has some errors, this page will show up like Figure – 9.



404 - Nothing Found

We are sorry, but the page you're looking for cannot be found.

Figure – 9

5.10. Usage Scenario 10: foot navigation bar

Foot navigation bar provides some convenient functions for users as Figure – 10.

Clicking the website logo: jumping to index page Figure – 1 – 1.

Clicking Sign In button to jump to sign in page Figure – 5 – 1.

Clicking View Cart button to jump to cart page Figure – 7.

Clicking My Wishlist button to jump to page wish list Figure – 6.

Clicking Track My Order button to jump to account page Figure – 8.

Uses can also search games by using the input searching box and click the Search button.

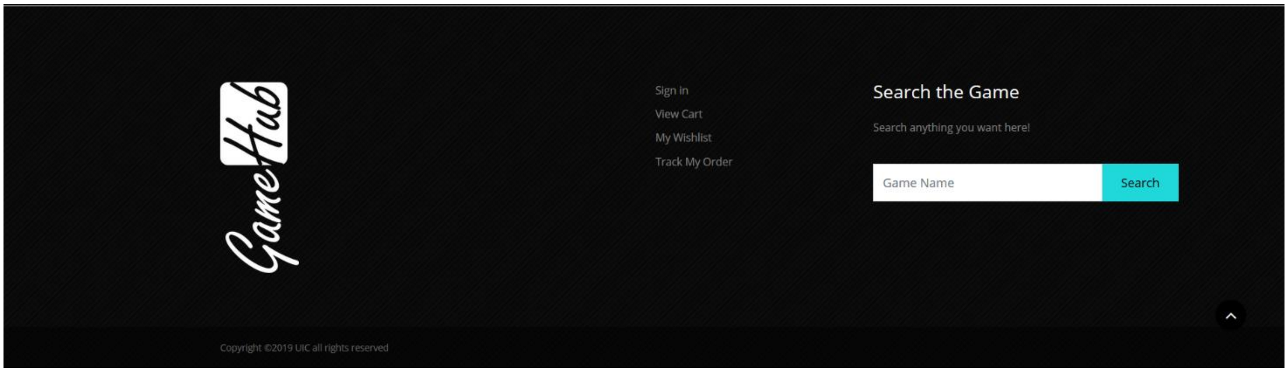
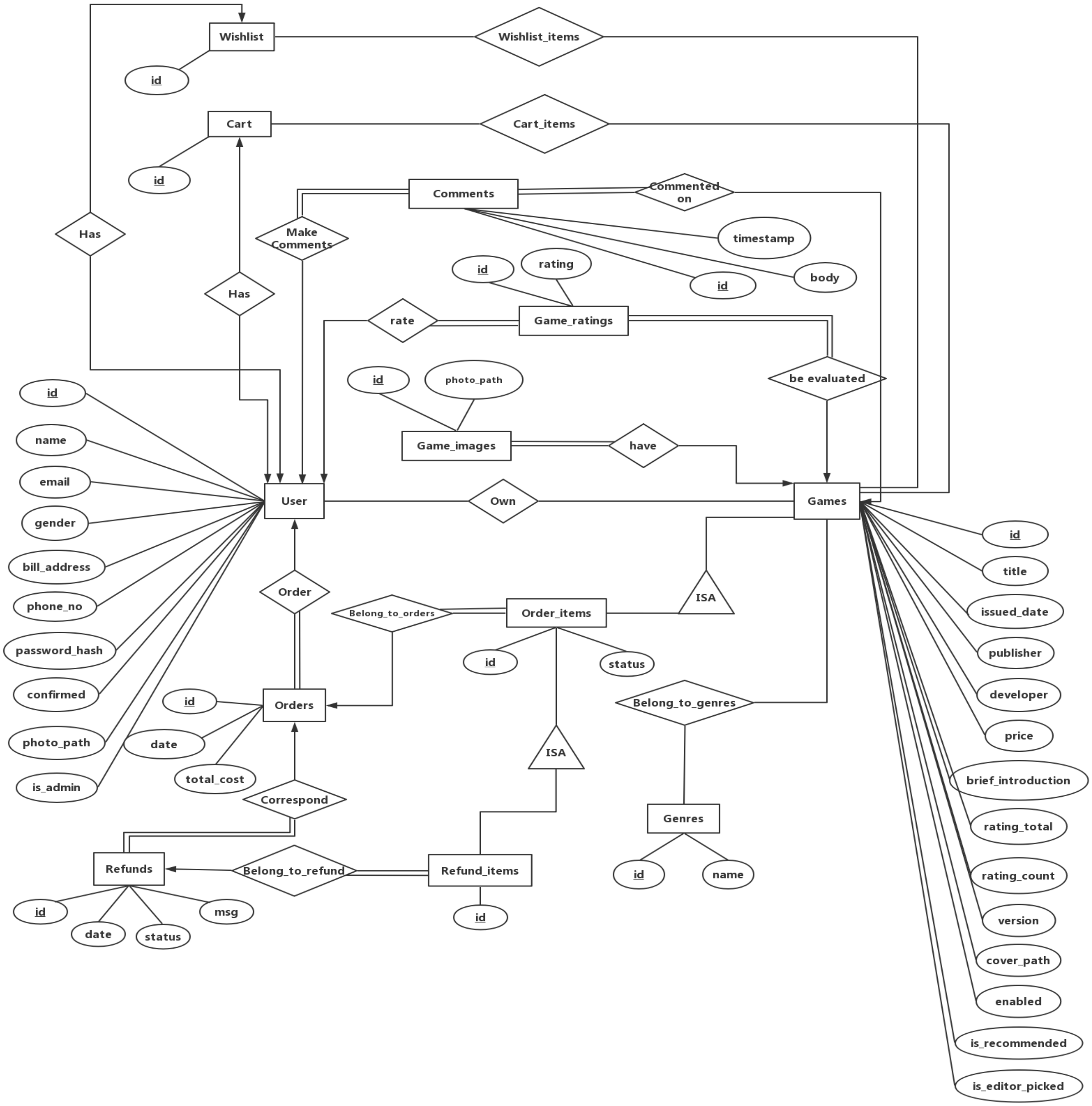

GameHub
Sign In
View Cart
My Wishlist
Track My Order
Search the Game
Search anything you want here!
Game Name
Search
Copyright ©2019 UIC all rights reserved

Figure – 10

6. Database Design



6.1. ER Diagram

6.2. System objective design

Game website database management system

6.2.1. For the user:

6.1.1.1: *User can view their information through the database*
6.1.1.2: *User can view the game information through the database*
6.1.1.3: *User can view the comments and forum, and the database can also store the comments of the user*
6.1.1.4: *User can view their games they have bought and collect*

6.2.2. For administrator:

6.1,2.1: *administrator can view the user information in back-stage management*
6.1.2.2: *administrator can view the order information and refund information of the user in order&refund information database*
6.1.2.3: *administrator can view the game information from the game database which include the price, developer, publisher, issued date and so on.*

6.3. Development design philosophy

6.2.1: *Try to use the existing software and hardware environment and advanced management system development plan to achieve the purpose of making full use of existing resources and improving system development level and application effect.*

6.2.2: *The system should comply with the rules of the game website management, meet the daily management needs of the website, and meet the requirements of intuitive, convenient, practical, and safe in the operation process.*

6.2.3: *The system adopts the C/S architecture. The client is responsible for providing the expression logic, displaying the user interface information, and accessing the system analysis. The preliminary work should be as detailed as possible so that the architecture of the website can be changed in the future, and some security requirements are not high. The information can be easily accessed using the Browser/Server method.*

6.2.4: *The system adopts a modular programming method, which facilitates the maintenance and maintenance of technical maintenance personnel who are not involved in the development, even in various combinations and modifications of system functions.*

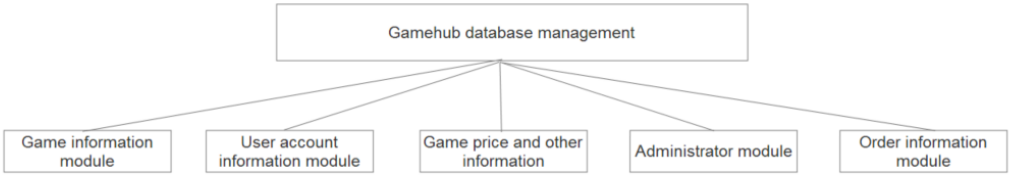
6.2.5: *The system should have database maintenance functions to add, delete, modify, backup, etc. data according to user needs.*

6.4. Development and run time environment selection

6.3.1: *Development: Mysql 5.7*
6.3.2: *Run-time environment: Windows 10, Windows 8, Windows 7, Windows 98, Windows 95, Mac Os, Android, IOS*

6.5. System function module design

Based on system function analysis:


Gamehub database management
Game information module
User account information module
Game price and other information
Administrator module
Order information module

6.6. Database Structure

6.6.1. Table1: Order information

Attribute	Data type	Null or not	Remark
id	INTEGER(11)	Not Null	primary key
User_id	INTEGER(11)	Not Null	Client ID
Date	DATE	Not Null	Order date
Total_cost	FLOAT	Not Null	Order cost

Table 1

6.6.2. Table 2: Order items

Attribute	Data type	Null or not	Remark
id	INTEGER(11)	Not Null	primary key
Order_id	INTEGER(11)	Not Null	Order belongs to
Game_id	INTEGER(11)	Not Null	Game id
status	VARCHAR(30)	Not Null	The current status

Table 2

6.6.3. Table 3: Refund information

Attribute	Data type	Null or not	Remark
id	INTEGER(11)	Not Null	primary key
User_id	INTEGER(11)	Not Null	Client ID
Order_id	INTEGER(11)	Not Null	Corresponding order
Date	DATE	Not Null	Refund date
Status	VARCHAR(30)	Not Null	Current status
Message	VARCHAR(200)	Not Null	Administrator's message

Table 3

6.6.4. Table 4: Refund item

Attribute	Data type	Null or not	Remark
id	INTEGER(11)	Not Null	primary key
Refund_id	INTEGER(11)	Not Null	Refund belongs to
Order_item_id	INTEGER(11)	Not Null	Corresponding order item

Table 4

6.6.5. Table 5: Comments

Attribute	Data type	Null or not	Remark
id	INTEGER(11)	Not Null	primary key
Game_id	INTEGER(11)	Not Null	Game be commented
User_id	INTEGER(11)	Not Null	User make comments
body	TEXT	Not Null	Comment content
timestamp	DATETIME	Not Null	When the comment is made

Table 5

6.6.6. Table 6: Wishlist

Attribute	Data type	Null or not	Remark
User_id	INTEGER(11)	Not Null	Client ID (Foreign key)
ID	INTEGER(11)	Not Null	Primary key

Table 6

6.6.7. Table 7: Wishlist content

Attribute	Data type	Null or not	Remark
ID	INTEGER(11)	Not Null	Primary key
Game_id	INTEGER(11)	Not Null	Corresponding game

Table 7

6.6.8. Table 8: Cart

Attribute	Data type	Null or not	Remark
id	INTEGER(11)	Not Null	primary key
User_id	INTEGER(11)	Not Null	User belongs to

Table 8

6.6.9. Table 9: Cart item

Attribute	Data type	Null or not	Remark
Cart_id	INTEGER(11)	Not Null	foreign key
Game_id	INTEGER(11)	Not Null	foreign key

Table 9

6.6.10. Table 10: Game

Attribute	Data type	Null or not	Remark
ID	INTEGER(11)	Not Null	ID(primary key)
title	VARCHAR(100)	Not Null	Name of the game
Issued Date	DATE	Not Null	Issued Date
Publisher	VARCHAR(100)	Not Null	Game publisher
Price	FLOAT	Not Null	The price of the game
Developer	VARCHAR(100)	Not Null	Game maker
Brief_introduction	TEXT	Not Null	Some information

Rating_total	*INTEGER(11)*	*Not Null*	*Cumulative rating*
Rating_count	*INTEGER(11)*	*Not Null*	*No of cumulative rating*
Version	*VARCHAR(100)*	*Not Null*	*The game version*
Cover_path	*VARCHAR(256)*	*Null*	*The file path of cover*
enabled	*TINYINT(1)*	*Not Null*	*Available or not*
Is_recommended	*TINYINT(1)*	*Not Null*	*Whether on the home page*
Is_editor_picked	*TINYINT(1)*	*Not Null*	*Whether picked*

Table 10

6.6.11. Table 11 : User

Attribute	*Data type*	*Null or not*	*Remark*
id	*INTEGER(11)*	*Not Null*	*primary key*
Name	*VARCHAR(100)*	*Not Null*	*User Name*
Gender	*VARCHAR(1)*	*Not Null*	*F or M*
Bill_Address	*VARCHAR(200)*	*Null*	*The address of the users*
Personal_Introduction	*TEXT*	*Null*	*Introduction*
Profile_Picture	*VARCHAR(256)*	*Not Null*	*File path*
Password	*VARCHAR(128)*	*Not Null*	*password*
Email_Address	*VARCHAR(100)*	*Not Null*	*The address of email*
Phone_No	*VARCHAR(50)*	*Not Null*	*Phone Number*
Confirmed	*TINYINT(1)*	*Not Null*	*Whether confirmed via email*
Is_admin	*TINYINT(1)*	*Not Null*	*Is administrator or not*

Table 11

6.6.12. Table 12: User_games

Attribute	*Data type*	*Null or not*	*Remark*
User_id	*INTEGER(11)*	*Not Null*	*Foreign Key*
Game_id	*INTEGER(11)*	*Not Null*	*Foreign Key*

Table 12

6.6.13. Table 13: Game_images

Attribute	*Data type*	*Null or not*	*Remark*
id	*INTEGER(11)*	*Not Null*	*primary key*
Game_id	*INTEGER(11)*	*Not Null*	*Foreign key*
Photo path	*VARCHAR(256)*	*Not Null*	*The file path of photo*

Table 13

6.6.14. Table 14: Game_images

Attribute	*Data type*	*Null or not*	*Remark*
id	*INTEGER(11)*	*Not Null*	*primary key*
name	*VARCHAR(100)*	*Not Null*	*The name of genre*

Table 14

6.6.15. Table 15: Game_genres

Attribute	*Data type*	*Null or not*	*Remark*
Game_id	*INTEGER(11)*	*Not Null*	*Foreign key*
Genre_id	*INTEGER(11)*	*Not Null*	*Foreign key*

Table 15

6.6.16. Table 16: Game_ratings

Attribute	*Data type*	*Null or not*	*Remarks*
Id	*INTEGER(11)*	*Not Null*	*Primary key*
Game_id	*INTEGER(11)*	*Not Null*	*Foreign key*
User_id	*INTEGER(11)*	*Not Null*	*Foreign key*
Rating	*INTEGER(11)*	*Not Null*	*Value of rating*

Table 16

6.7. Schema

6.7.1. User

User (id, name, email, gender, bill_address, phone_no, password_hash, confirmed, photo_path, is_admin)

User represents the real user in GAMEHUB system.

Id: Primary Key of user, used to distinguish each student.
Name: The registration name of each user.
Email: The email address user used for registration.
Gender: The gender of the user.
Bill_address: The mailing address of physical bills.
Phone_no: The telephone number of each user.
Password_hash: The password of the user account.
Confirmed: One user account can only operate normally after user clicking the confirming link in the email address he used for registration. Confirmed represents the status whether user has confirmed or not.
Photo_path: The file path of user's profile.
Is_admin: The status indicates whether user is an administrator or not.

6.7.2. Games

Game (id, title, issued_date, publisher, developer, price, brief_introduction, rating_total, rating_count, version, cover_path, enabled, is_recommended, is_editor_picked)

Games represents the games sold in the GAMEHUB store.

Id: Primary Key of game, used to distinguish each game in the system.
Title: The name of the game.
Issued_date: The date when the game is issued.
Publisher: The publisher of the game.
Developer: The developer of the game.

Price: The price of the game.
Brief_introduction: Introduction to the content and characteristics of the game.
Rating_total: The cumulative ratings the game has received.
Rating_count: The number of ratings the game has received.
Version: The current version of the game.
Cover_path: The file path of the cover of the game.
Enabled: The status of whether the game can be searched and sold in the store.
Is_recommended: The status of whether the game is recommended to the home page.
Is_editor_picked: The status of whether the game is picked by editor to the home page.

6.7.3. Game_ratings

Game_ratings (id, game_id, user_id, rating)

Game_ratings represents the ratings user made for particular games.

Id: Primary Key of game_ratings. Id of game_ratings used to distinguish each rating.
Game_id: Foreign Key referencing Games. The id of the game be rated.
User_id: Foreign Key referencing User. The id of the user makes the rating.
Rating: The value of the rating.

6.7.4. Game_images

Game_images (id, game_id, photo_path)

Game_images represents the images of the particular games.

Id: Primary Key of game_images. The id is used to distinguish each image from each other.
Game_id: Foreign Key referencing Game. The id of the game the image belongs to.
Photo_path: The file path of the game image.

6.7.5. Belong_to_genres

Belong_to_genres (genre_id, game_id)

The n to n relationship set represents that one game can belong to many genres and one genre can have many games.

Genre_id and game_id: Primary Key.
Genre_id: Foreign Key referencing Genre. The id used to distinguish each genre.
Game_id: Foreign Key referencing Game. The id of the game.

6.7.6. Genres

Genres (id, name)

Genres represents the types of games in the system.

Id: Primary Key of Genres. The id used to distinguish each genre.
Name: The name of the genre corresponding to each genre id.

6.7.7. Orders

Orders (id, user_id, total_cost, date)

Orders represents the orders users make when they buy games.

Id: Primary Key of Orders. The id used to distinguish each order.

User_id: Foreign Key referencing User. The id of the user makes the order.

Total_cost: The total cost of the items in particular order.

Date: The particular date the order is made.

6.7.8. Order_items

Order_items (id, order_id, game_id, status)

Order_items represents the particular products one user has purchased in one particular order.

Id: Primary Key of Order_items. This id is used to distinguish each item of the order.

Order_id: Foreign Key referencing Order. The order_id represents the id of the order the item belongs to.

Game_id: Foreign Key referencing Game. The id of the game the item actually is.

Status: The status indicates whether the order item is available. (if admin accept the refund request, the game will be no more available for the user to play)

6.7.9. Refunds

Refunds (id, order_id, date, status, msg)

Refunds represents the refund requests user made.

Id: Primary Key of Refunds. This id is used to distinguish each refund record.

Order_id: Foreign Key referencing Order. This represents the corresponding order of the refund request. (One order can correspond to many refunds since that there may be many order items).

Date: The specific date the refund is requested.

Status: The process status of the refund request.

Msg: The message administrator sent to the user when process the refund request.

6.7.10. Refund_items

Refund_items (id, refund_id, order_item_id)

Refund_items represents the particular products one user has request a refund in one particular order.

Id: Primary Key of Refund_items. This id is used to distinguish each refund item.

Refund_id: Foreign Key referencing Refund. The id of the refund the refund item belongs to.

Order_item_id: Foreign Key referencing Order_items. The id of the order item(game) the refund item actually is.

6.7.11. User_games

User_games (user_id, game_id)

User_games models the relationship set between entity user and entity games.

User_id and game_id: Primary Key.

User_id: Foreign Key referencing User. The id of the user.

Game_id: Foreign Key referencing Game. The id of the game.

6.7.12. Comments

Comments (id, game_id, user_id, timestamp, body)

Comments represents the comments user made for the particular games.

Id: Primary Key of Comments. This id is used to distinguish each comment.

Game_id: Foreign Key referencing Game. The id of the game be commented.

User_id: Foreign Key referencing User. The id of the user made the comment.

Timestamp: The specific time when user made the comment.

Body: The content of the comment.

6.7.13. Cart

Cart (id, user_id)

Cart represents the cart which can store the items which users plan to buy.

Id: Primary Key of Cart. This id is used to distinguish each cart.

User_id: Foreign Key referencing User. The user_id represents the particular user the cart belongs to.

6.7.14. Cart_items

Cart_items (cart_id, game_id)

Cart_items represents the game product included in a particular cart.

Cart_id and game_id: Primary Key of Cart_items.

Cart_id: Foreign Key referencing Cart. The id of the cart the item should belongs to.

Game_id: Foreign Key referencing Game. The id of the game product in the cart which the item actually is.

6.7.15. Wishlist

Wishlist (id, user_id)

Wishlist represents the wish list which can store the items which users wish to buy.

Id: Primary Key of Wishlist. This id is used to distinguish each wish list.

User_id: Foreign Key referencing User. The user_id represents the particular user the cart belongs to.

6.7.16. Wishlist_item

Wishlist_item (wishlist_id, game_id)

Wishlist_item represents the game product included in a particular wish list.

Wishlist_id and game_id: Primary Key of Wishlist_item.
Wishlist_id: Foreign Key referencing Wishlist. The id of the wish list the item should belongs to.
Game_id: Foreign Key referencing Game. The id of the game product in the wish list which the item actually is.

6.8. Functional dependency

6.8.1.

User_id -> name, email, gender, bill_address, phone_no, password_hash, confirmed, photo_path, is_admin

6.8.2.

Game_id -> title, issued_date, publisher, developer, price, brief_introduction, rating_total, rating_count, version, cover_path, enabled, is_recommended, is_editor_picked

6.8.3.

Rating_id -> game_id, user_id, rating

6.8.4.

Image_id -> game_id, photo_path

6.8.5.

Genre_id -> name

6.8.6.

Order_id -> user_id, total_cost, order_date

6.8.7.

Order_item_id -> order_id, game_id, status

6.8.8.

Refund_id -> order_id, refund_date, status, msg

6.8.9.

Refund_item_id -> refund_id, order_item_id

6.8.10.

Comment_id -> game_id, user_id, timestamp, body

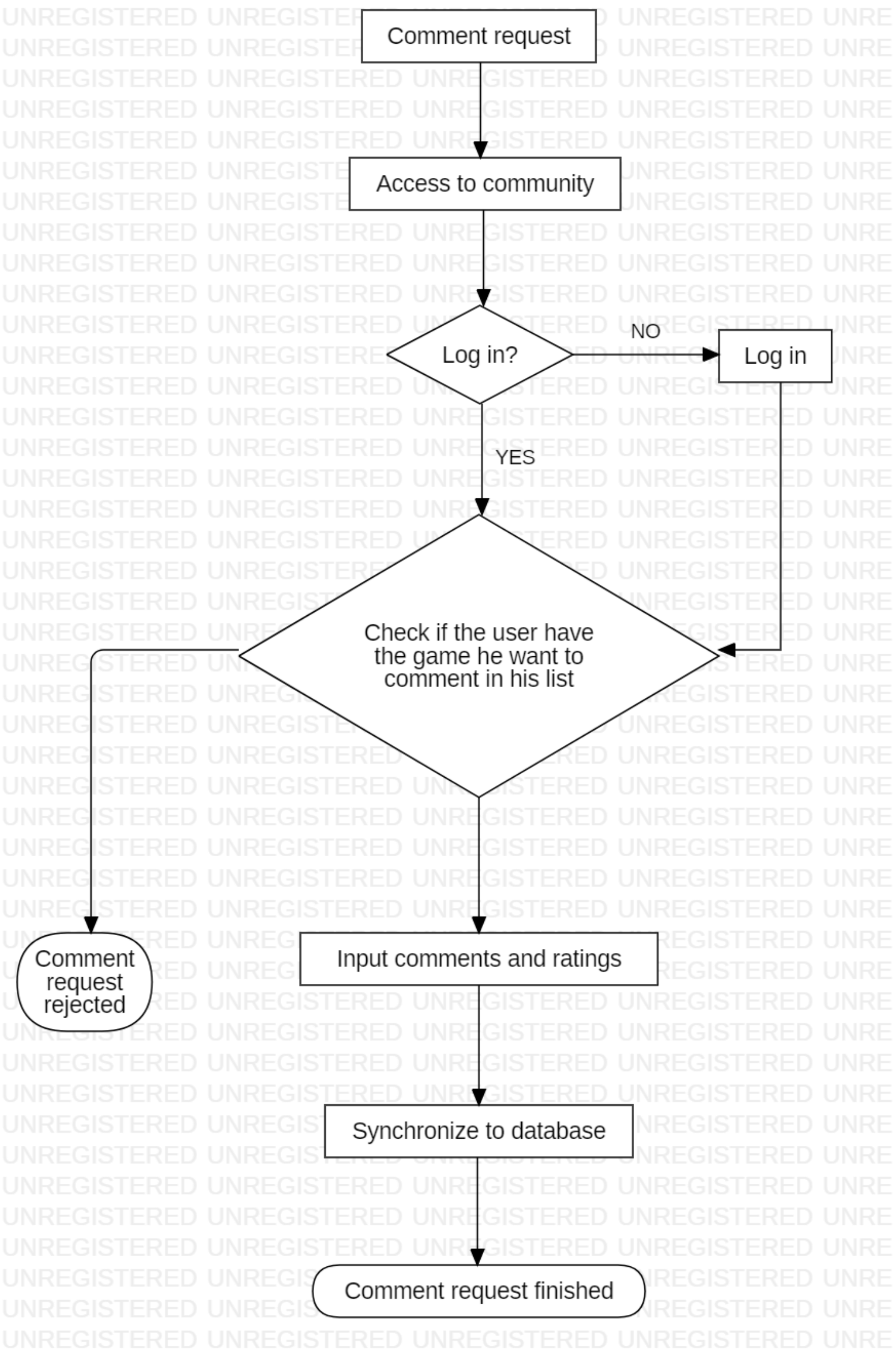
6.8.11.

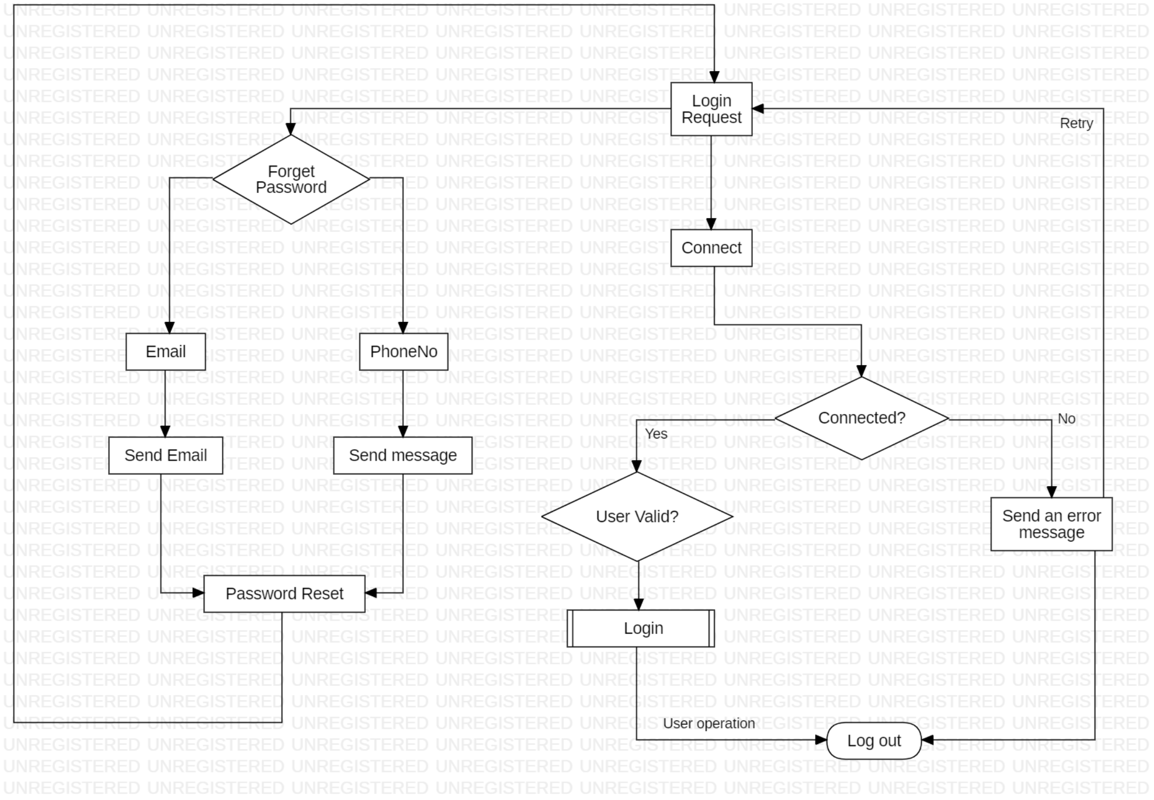
Cart_id -> user_id

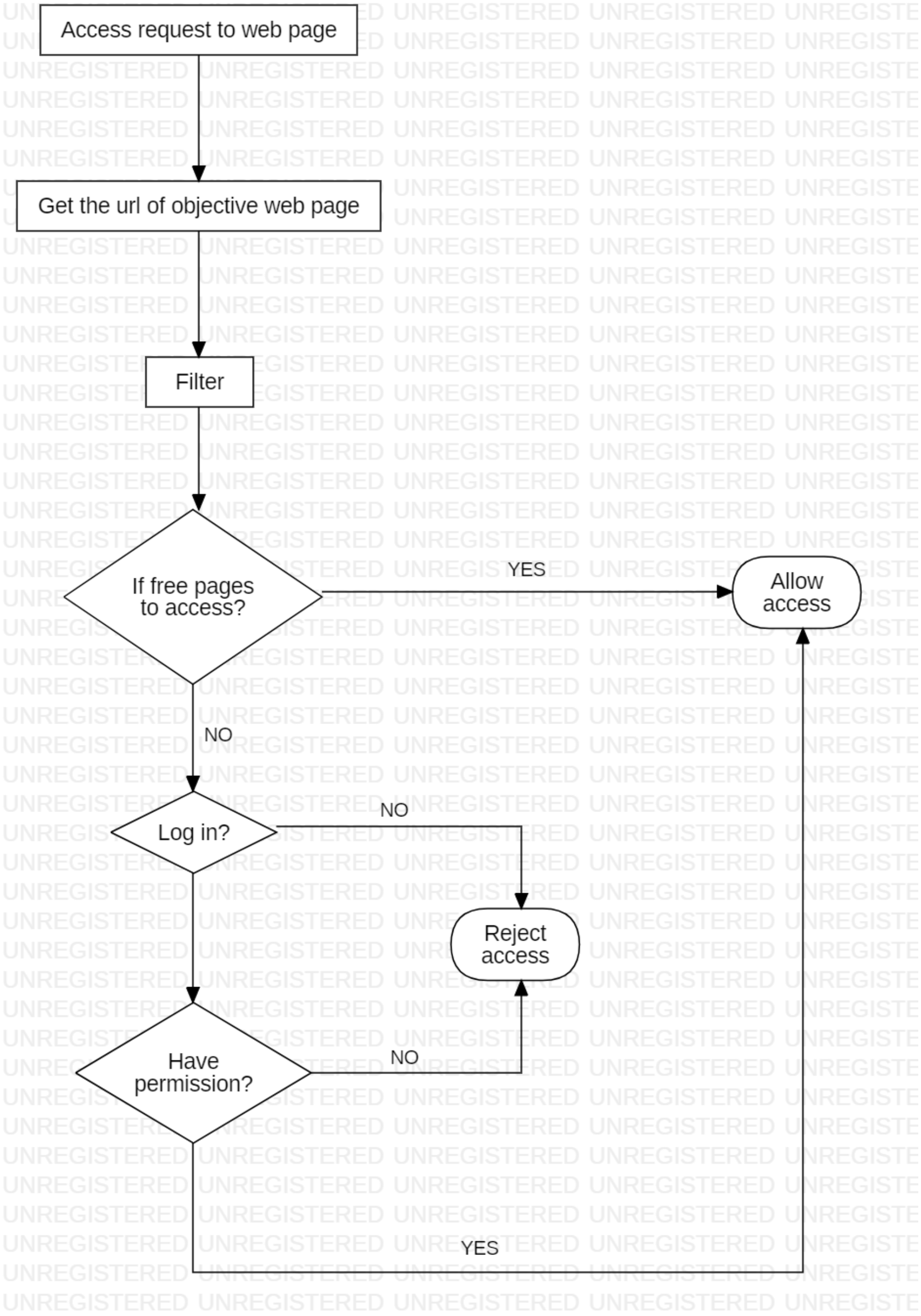
6.8.12.

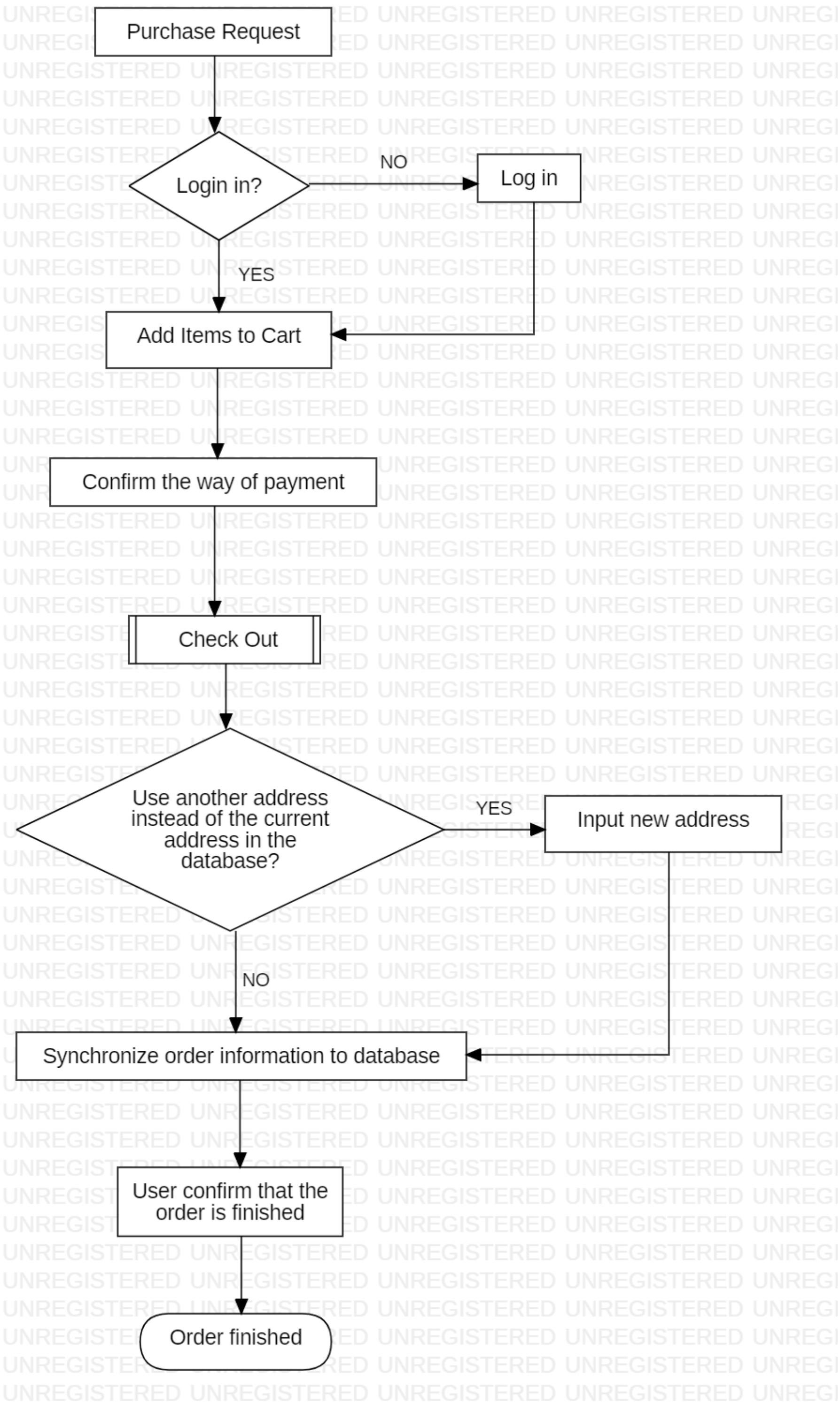
Wishlist_id -> user_id

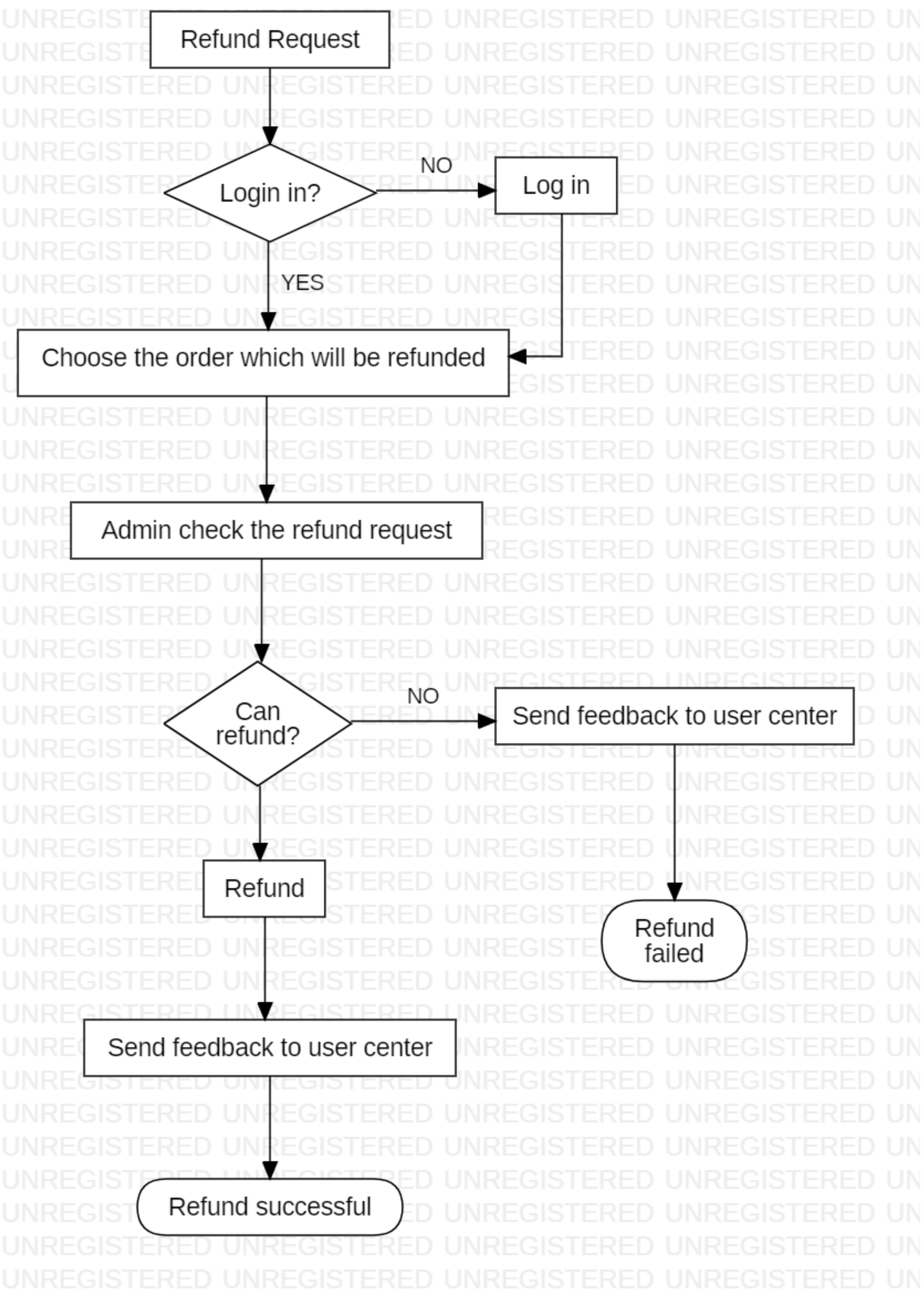
7. Diagrams

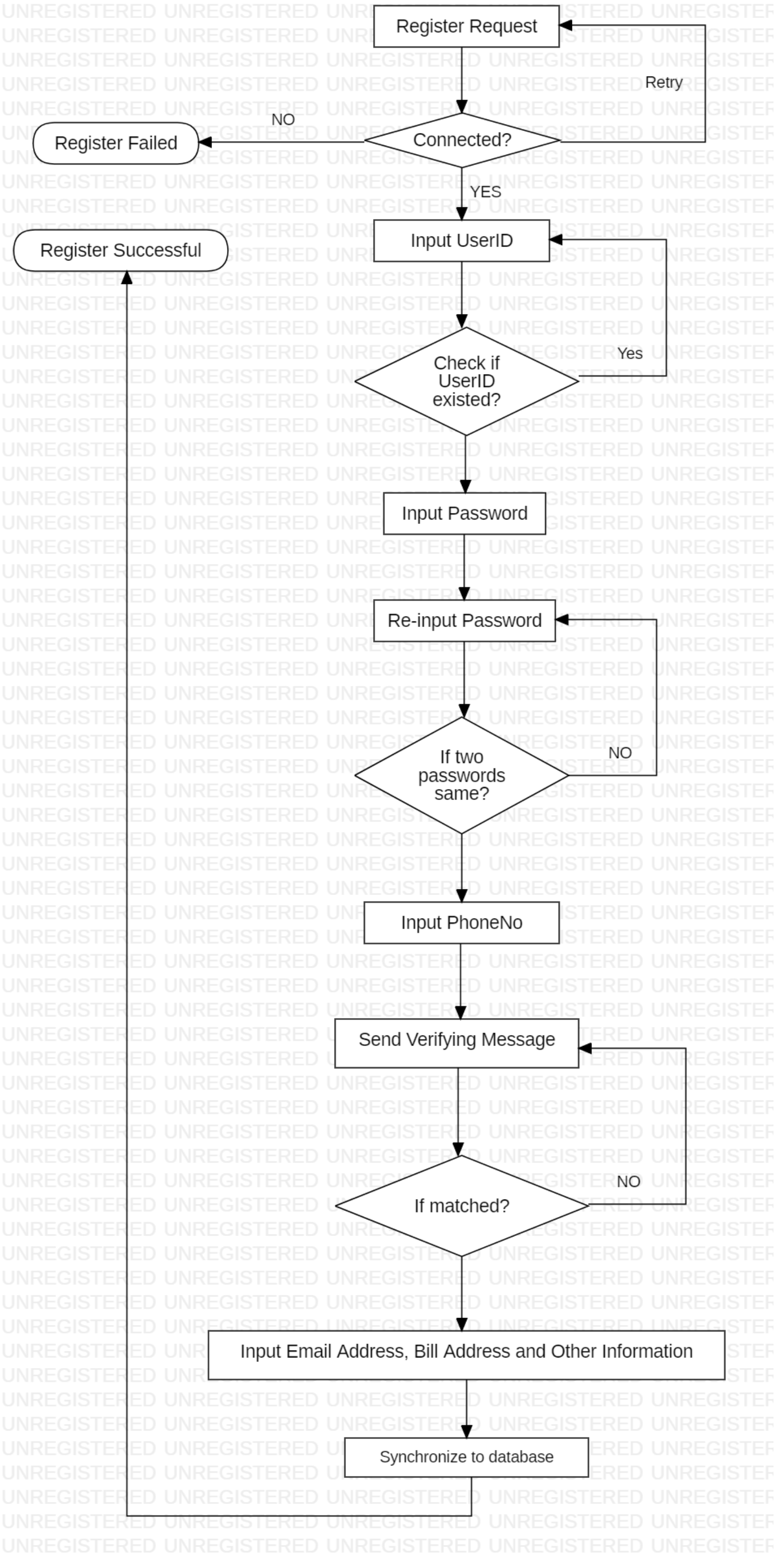

Comment request
Access to community
Log in?
NO
Log in
YES
Check if the user have the game he want to comment in his list
Comment request rejected
Input comments and ratings
Synchronize to database
Comment request finished

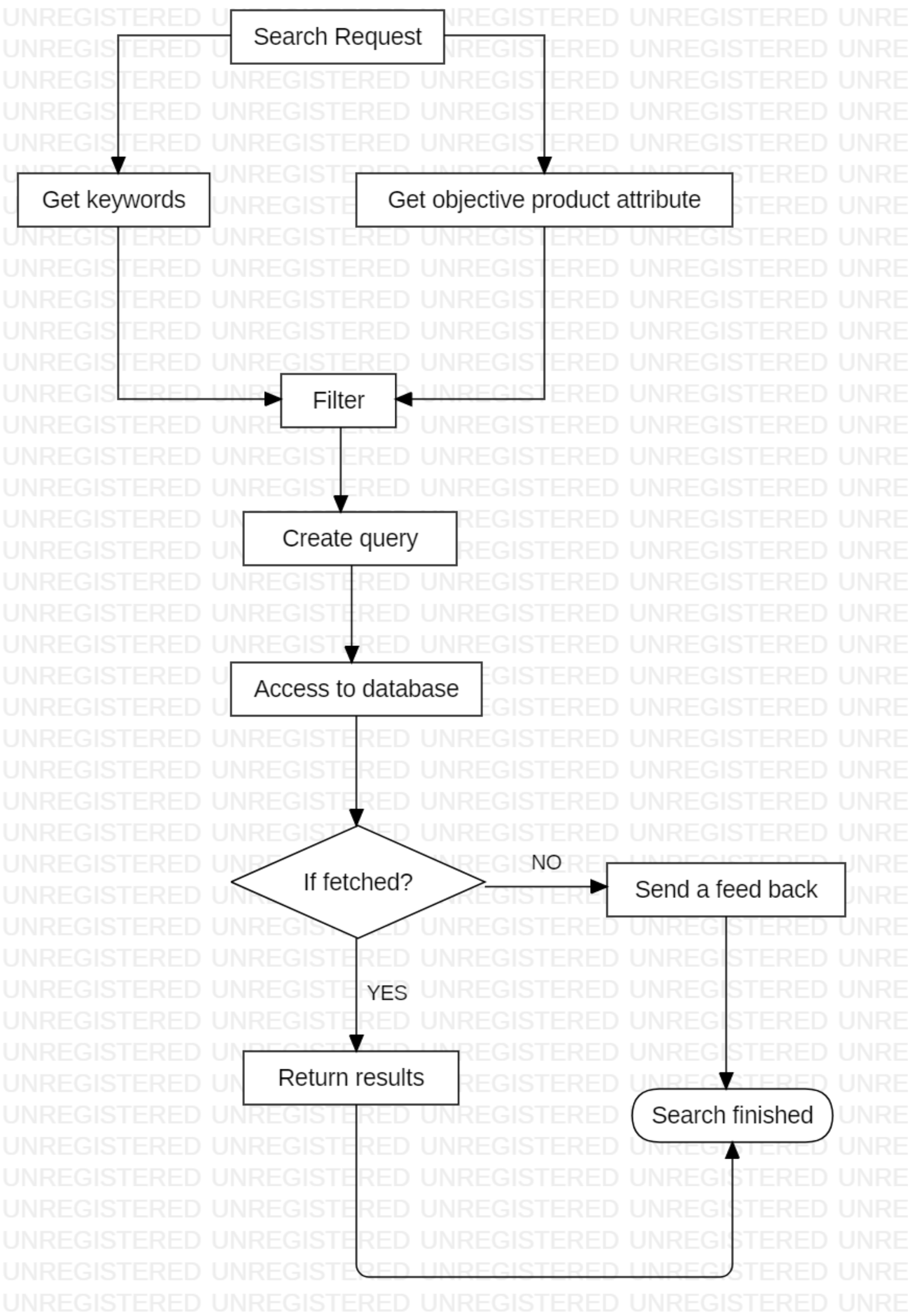

Login Request
Retry
Forget Password
Connect
Email
PhoneNo
Connected?
No
Yes
Send Email
Send message
User Valid?
Send an error message
Password Reset
Login
User operation
Log out


Access request to web page
Get the url of objective web page
Filter
If free pages to access?
YES
Allow access
NO
Log in?
NO
Reject access
Have permission?
NO
YES


Purchase Request
Login in?
NO
Log in
YES
Add Items to Cart
Confirm the way of payment
Check Out
Use another address instead of the current address in the database?
YES
Input new address
NO
Synchronize order information to database
User confirm that the order is finished
Order finished


Refund Request
Login in?
NO
Log in
YES
Choose the order which will be refunded
Admin check the refund request
Can refund?
NO
Send feedback to user center
Refund
Refund failed
Send feedback to user center
Refund successful


Register Request
Retry
NO
Register Failed
Connected?
YES
Input UserID
Register Successful
Check if UserID existed?
Yes
Input Password
Re-input Password
NO
If two passwords same?
Input PhoneNo
Send Verifying Message
NO
If matched?
Input Email Address, Bill Address and Other Information
Synchronize to database


Search Request
Get keywords
Get objective product attribute
Filter
Create query
Access to database
If fetched?
NO
Send a feed back
YES
Return results
Search finished