FIT5192 Assignment One - Design Report
Hyperspace Digital Commodity Trading System

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Declaration

I declare that this Design Report is my individual work. I have not copied from any other student’s work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part of this submission been written for me by another person.

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1 Goal Overview

1.1 System Goal introduction

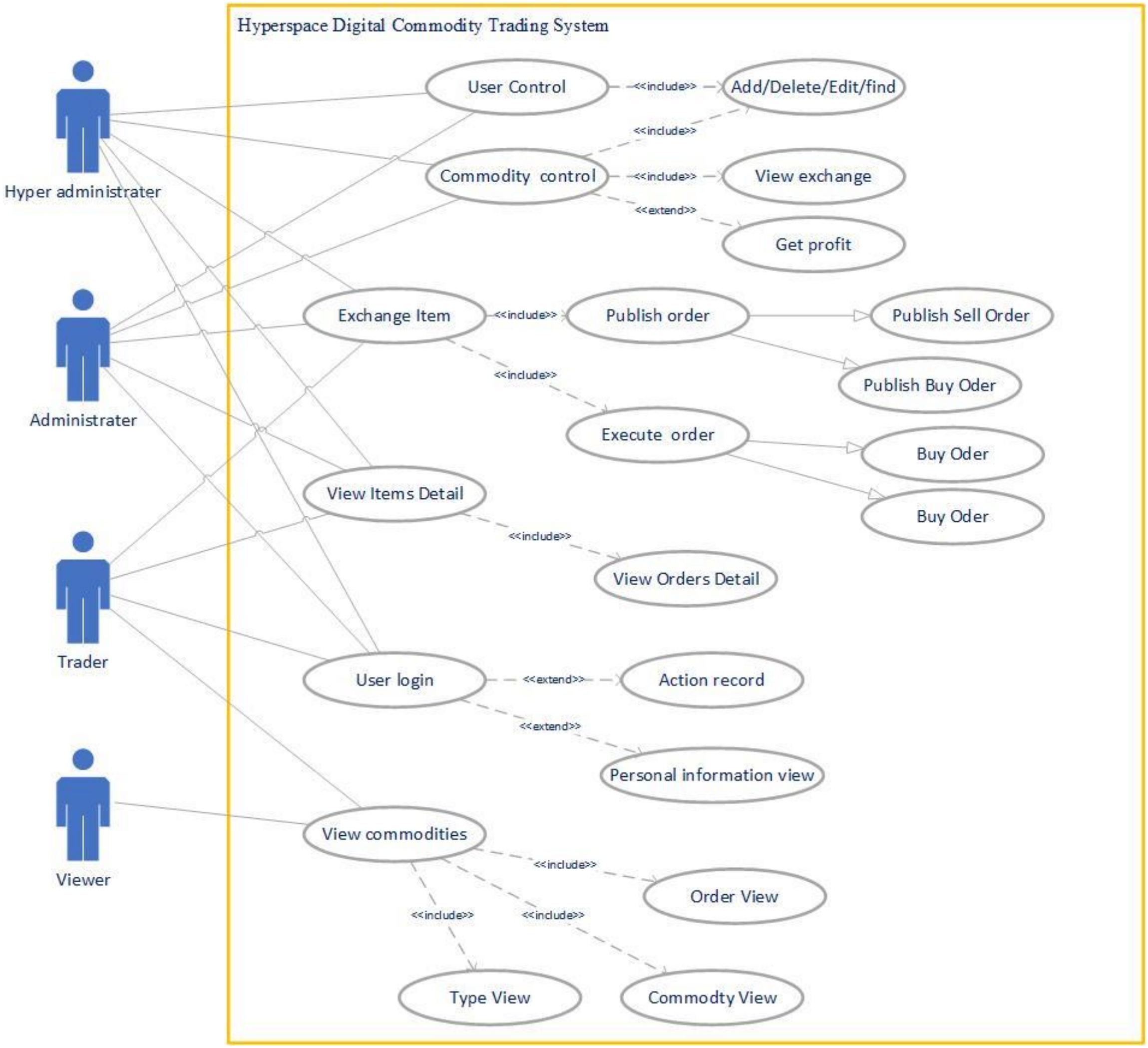
This Collectible Items Exchange project (after referred to as CIX) is different from other ordinary CIX. Ordinary CIX requires a unified super administrator to buy and sell. Therefore, ordinary CIX single fixed-price user trading is extremely unfriendly to users, insensitive to market changes, and requires frequent management by administrators. In this case, if the price is not well positioned, users will not be inclined to use it.

So I'd like to build a system that allows everyone to publish an order at the price and quantity of the items they need and let other users execute the order. This order can be a purchase order and a sale order. The whole system is rewarded by adding a tax rate between order execution. For example, User A releases an order for him to sell five bitcoins (digital products) for $30, which is multiplied by the tax rate and posted on the CIX system. User B feels the price is reasonable and uses his credit to execute the order, which is to buy the five bitcoins for $33 each. In fact, the new CIX can do all the functions of traditional CIX, and super administrators can buy and sell commodities.

It's like a futures market or a stock market. There is a restriction that orders cannot be executed according to the user's choice of orders. Only the best order can be selected. For example, User A and User B have issued sales orders for the same commodity. User A is cheaper, so User C can only choose the order of User A, which is cheaper.

Therefore, the CIX system allows each user to complete transactions with other users, and administrators can directly profit by making a price difference from it without having to work hard to control the volume of transactions. The items to be traded are chosen by the administrator. The items to be traded should not fade and there is no difference between the same items. The system focuses on trading digital goods, such as equipment in video games. So the whole system full name is Hyperspace Digital Commodity Trading System.

1.2 User Case



User case diagram

2 System Architecture Illustration

2.1 Fundamental technique

This project use these Tools:

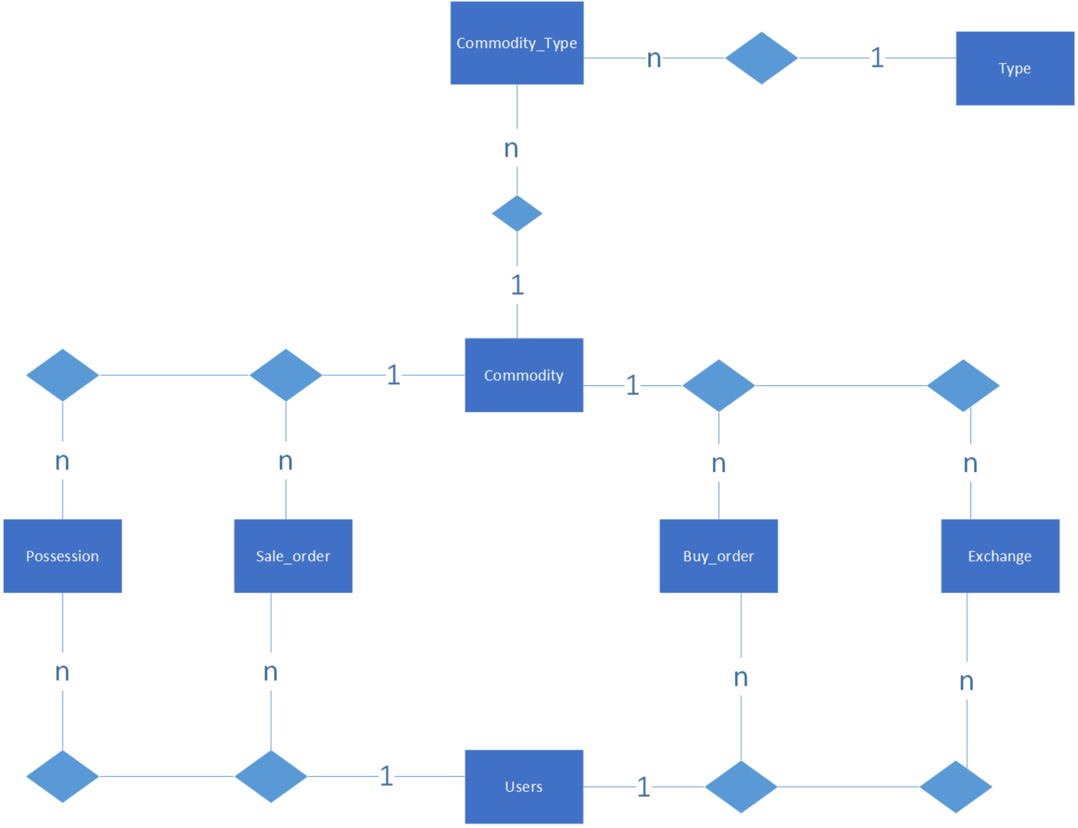
Netbean8.1 IDE
JAVA JDK 1.8
Glassfish 5.0
Derby Database(Java DB)
bootstrap

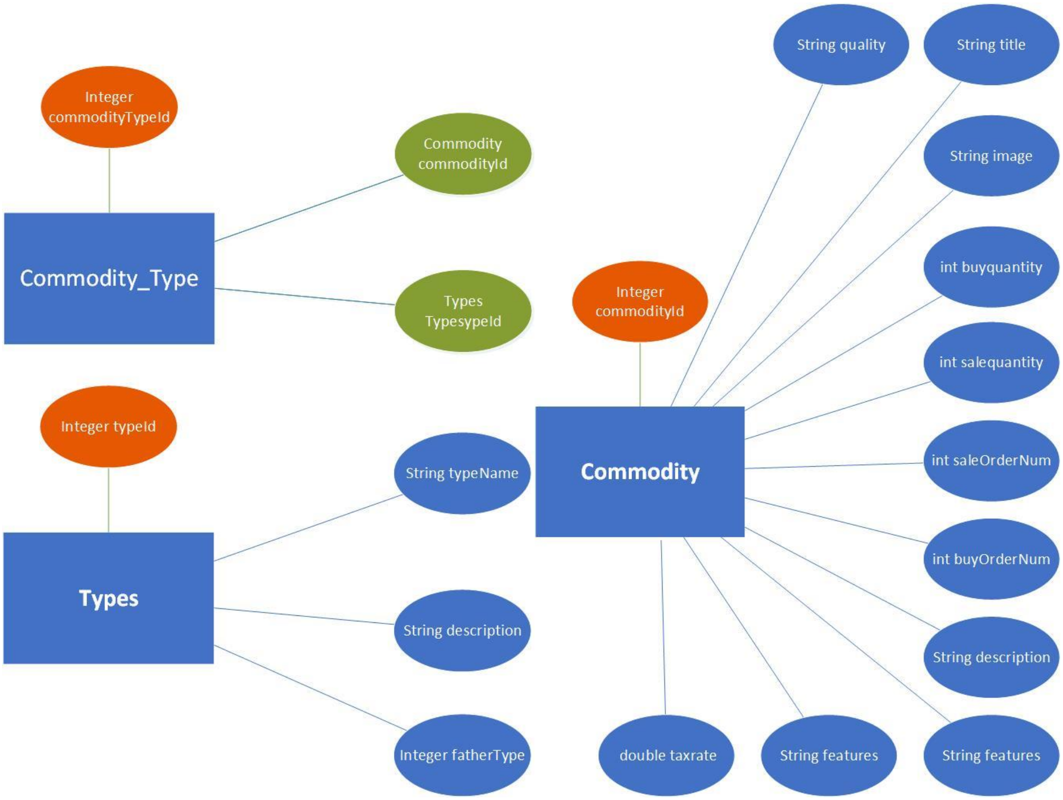
This project use these main techniques:

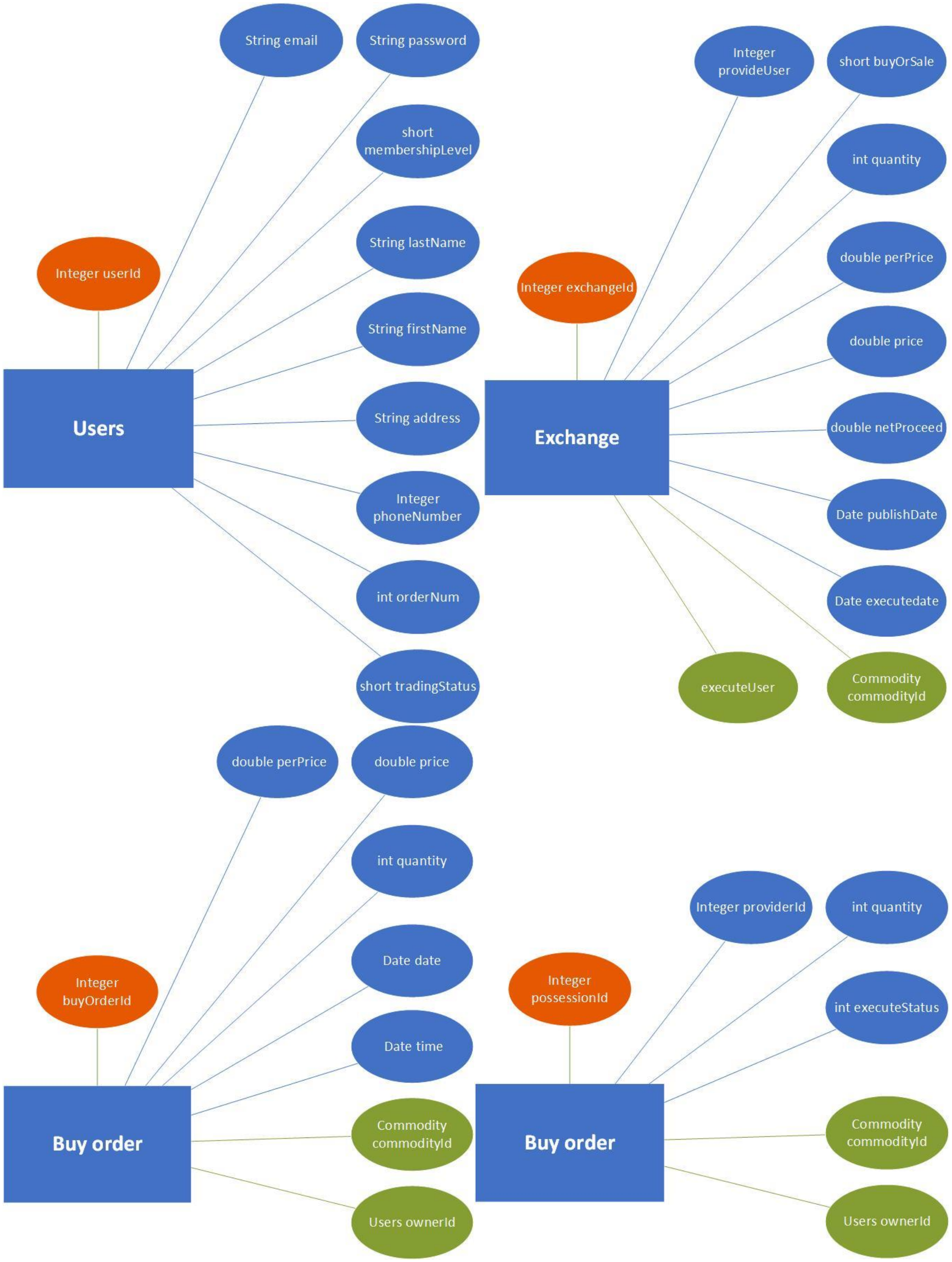
JavaServer Faces
Java Persistence API
EJB
Java Script

2.2 Entity Structure

There are 8 entities. They are commodity, Commodity Type, Type, Exchange, Shale Order, Buy Order, User, Possession.



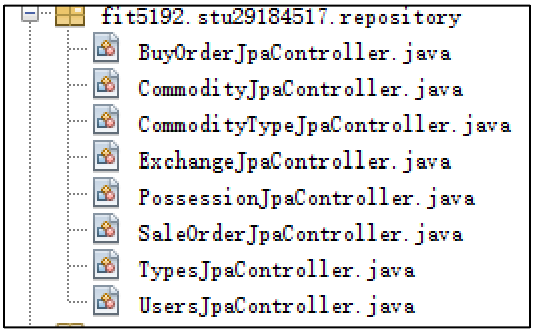




E-R diagram

Sale order attributes are similar to the buy order. The reason I use separate buy and sale order is for describing more clear logic and being easy to operate.

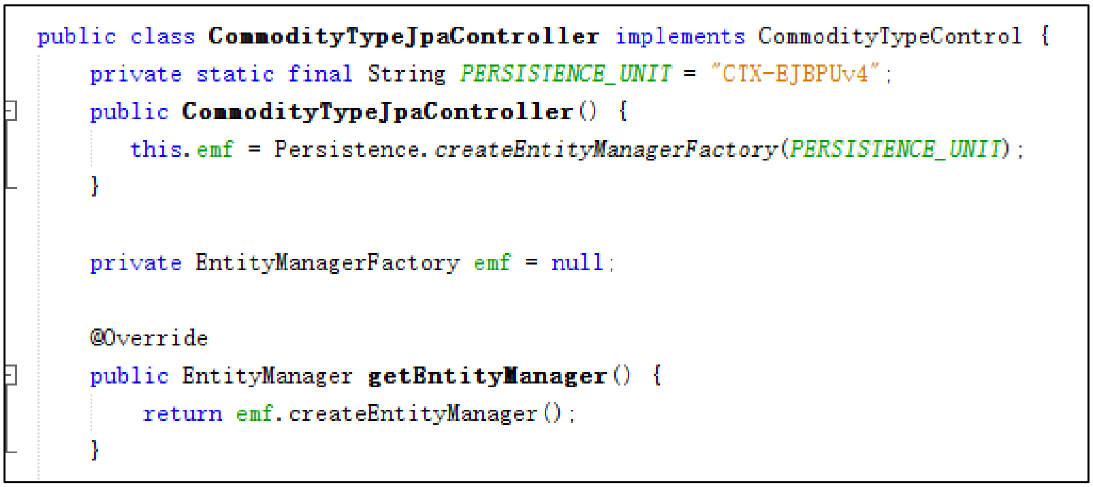
2.3 EJB-JPAControler



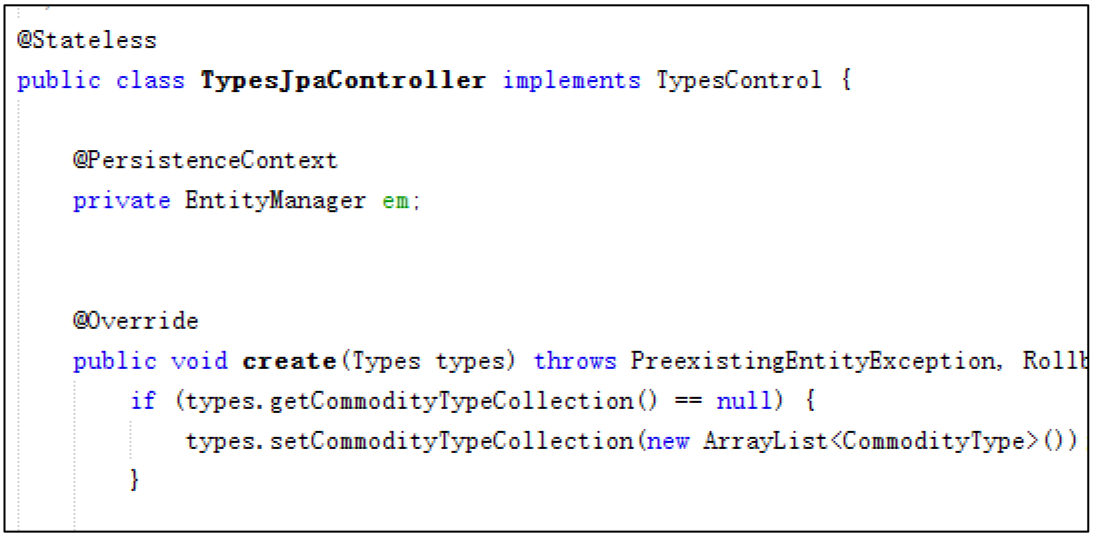
```
fit5192.stu29184517.repository
    BuyOrderJpaController.java
    CommodityJpaController.java
    CommodityTypeJpaController.java
    ExchangeJpaController.java
    PossessionJpaController.java
    SaleOrderJpaController.java
    TypesJpaController.java
    UsersJpaController.java
```

For each entity, I use independent JPA controller, to handle different table operation, including adding, delete, update, find and special operation SQL sentence.

They were implemented by using of both application managed entity manager and container managed entity manager.



```
public class CommodityTypeJpaController implements CommodityTypeControl {
    private static final String PERSISTENCE_UNIT = "CTX-EJBPUv4";
    public CommodityTypeJpaController() {
        this.emf = Persistence.createEntityManagerFactory(PERSISTENCE_UNIT);
    }

    private EntityManagerFactory emf = null;

    @Override
    public EntityManager getEntityManager() {
        return emf.createEntityManager();
    }
```

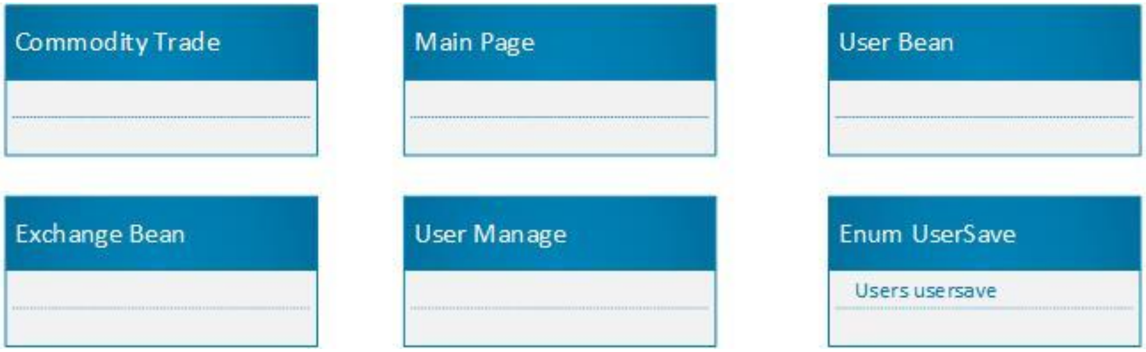


```
@Stateless
public class TypesJpaController implements TypesControl {

    @PersistenceContext
    private EntityManager em;


    @Override
    public void create(Types types) throws PreexistingEntityException, Rollb
        if (types.getCommodityTypeCollection() == null) {
            types.setCommodityTypeCollection(new ArrayList<CommodityType>())
        }
```

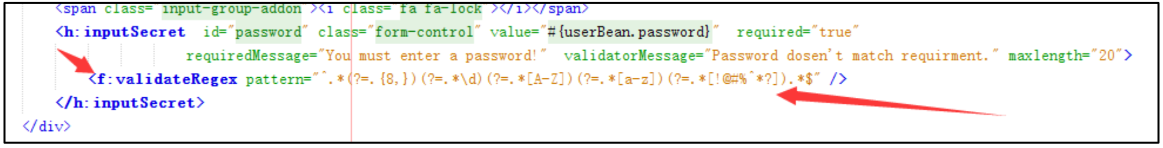
Implement method

2.4 JSf Bean and Xhtml

For webs front end, it uses 5 JavaServer Faces Bean to manage front end logic. Usersave is a enum static class. when user log in successfully, this user's information will save in it for waiting used.



For validate the right format of inputs. It use JSF validator assembly, and use regulation formula to check input content.



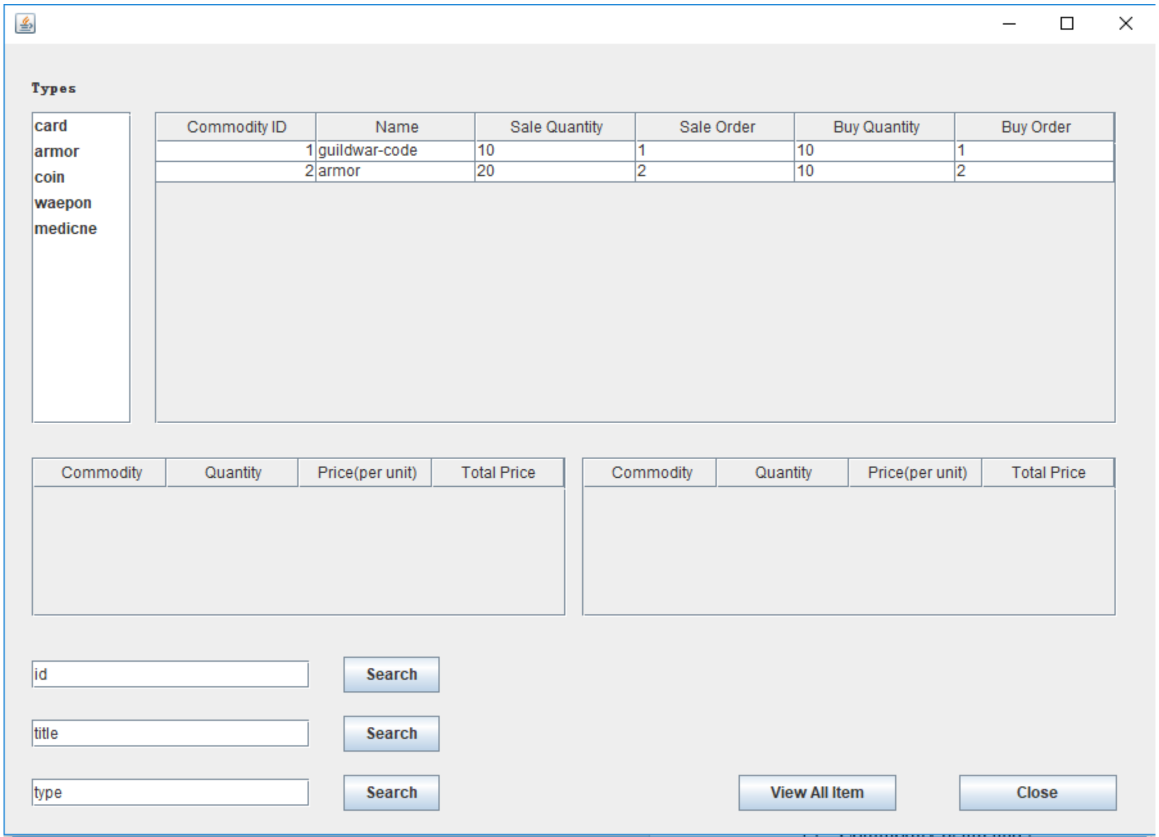
```
    <span class="input-group-addon"><i class="fa fa-lock"></i></span>
    <h:inputSecret  id="password" class="form-control" value="#{userBean.password}"  required="true"
                requiredMessage="You must enter a password!"  validatorMessage="Password dosen't match requirment." maxlength="20">
      <f:validateRegex pattern="^.*(?=.{8,})(?=.*\d)(?=.*[A-Z])(?=.*[a-z])(?=.*[!@#%^*?]).*$" />
    </h:inputSecret>
</div>
```

3 Description of core application functionality

There are some core applications will show in this simply.

a) GUI

It can use three queries, or you can click View all to display all products. It also displays the details of the goods and all types, and when there is only one item in the list, the corresponding purchase and sale orders are displayed.



Commodity ID	Name	Sale Quantity	Sale Order	Buy Quantity	Buy Order
1	guildwar-code	10	1	10	1
2	armor	20	2	10	2

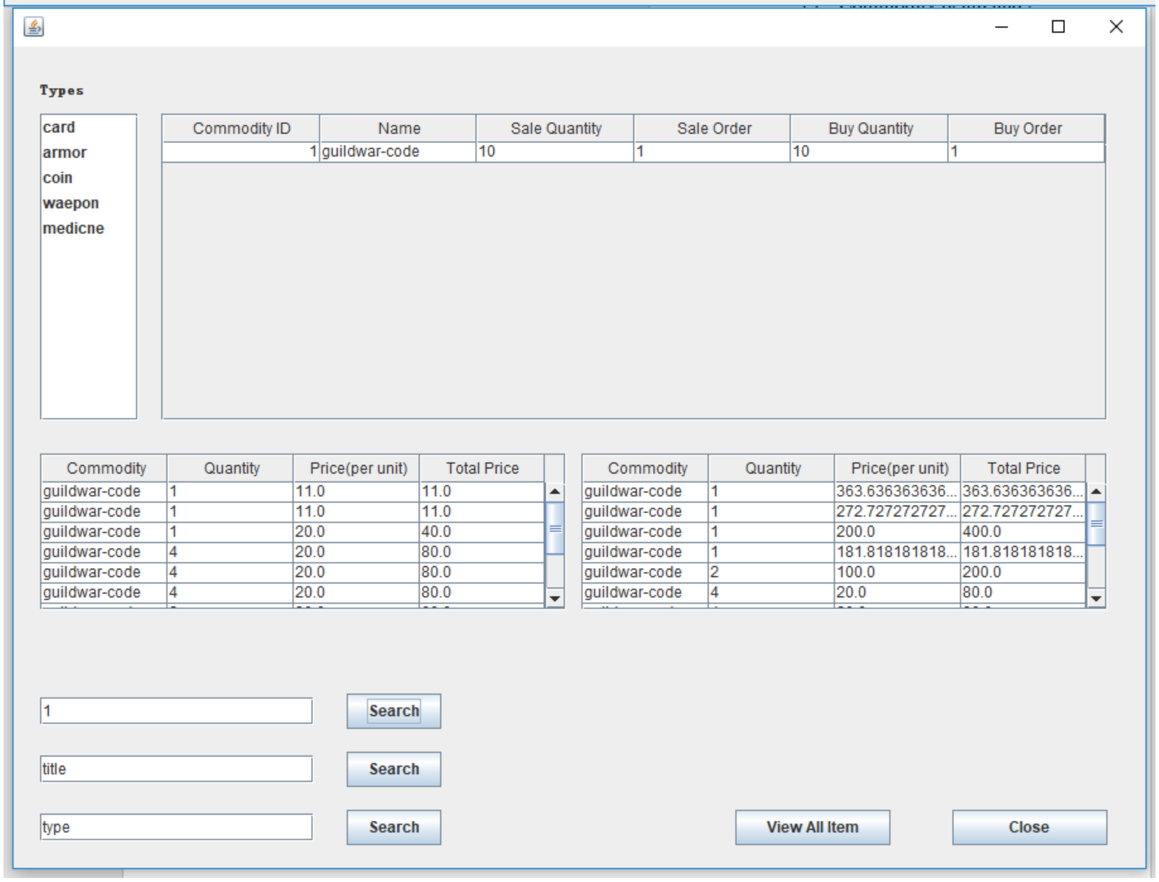
Commodity	Quantity	Price(per unit)	Total Price

Commodity	Quantity	Price(per unit)	Total Price

id

title

type



Commodity ID	Name	Sale Quantity	Sale Order	Buy Quantity	Buy Order
1	guildwar-code	10	1	10	1

Commodity	Quantity	Price(per unit)	Total Price
guildwar-code	1	11.0	11.0
guildwar-code	1	11.0	11.0
guildwar-code	1	20.0	40.0
guildwar-code	4	20.0	80.0
guildwar-code	4	20.0	80.0
guildwar-code	4	20.0	80.0

Commodity	Quantity	Price(per unit)	Total Price
guildwar-code	1	363.636363636...	363.636363636...
guildwar-code	1	272.727272727...	272.727272727...
guildwar-code	1	200.0	400.0
guildwar-code	1	181.818181818...	181.818181818...
guildwar-code	2	100.0	200.0
guildwar-code	4	20.0	80.0

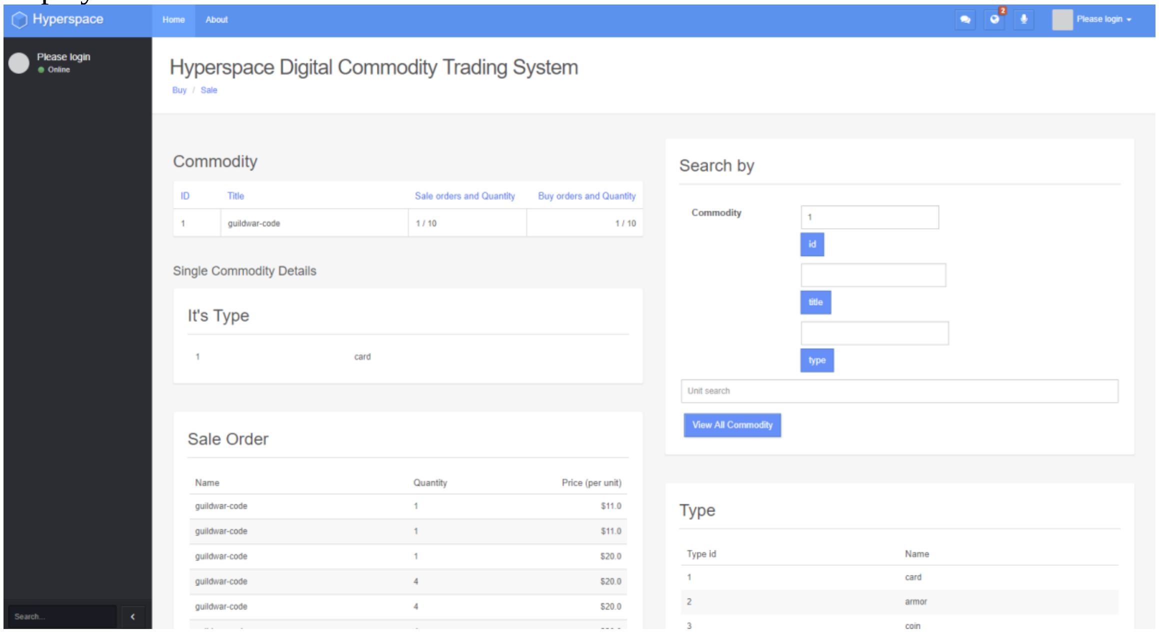
1

title

type

b) Web Viewer

It can browse the list and information of goods and can find corresponding products through ID Title type. If there is only one item left in the list, the corresponding purchase and sale order will be displayed. The corresponding types of commodities will also be displayed.



Hyperspace Digital Commodity Trading System

Buy / Sale

Commodity

ID	Title	Sale orders and Quantity	Buy orders and Quantity
1	guildwar-code	1 / 10	1 / 10

Single Commodity Details

It's Type

1	card

Sale Order

Name	Quantity	Price (per unit)
guildwar-code	1	$11.0
guildwar-code	1	$11.0
guildwar-code	1	$20.0
guildwar-code	4	$20.0
guildwar-code	4	$20.0

Search by

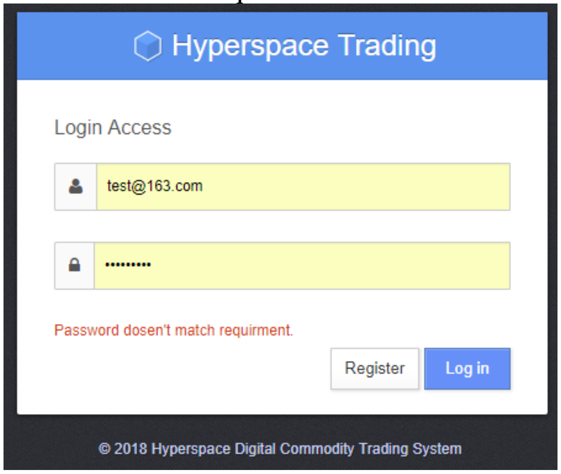
Commodity: 1

Type

Type id	Name
1	card
2	armor
3	coin

c) Login

Login will validate the input, and the mailbox and password will be incorrect if the format is incorrect. If the input format is correct, but the mailbox password is incorrect, there should be another pop-up. If login is successful, user information will be recorded to facilitate subsequent calls.



Login Access

test@163.com

•••••••••

Password dosen't match requirment.

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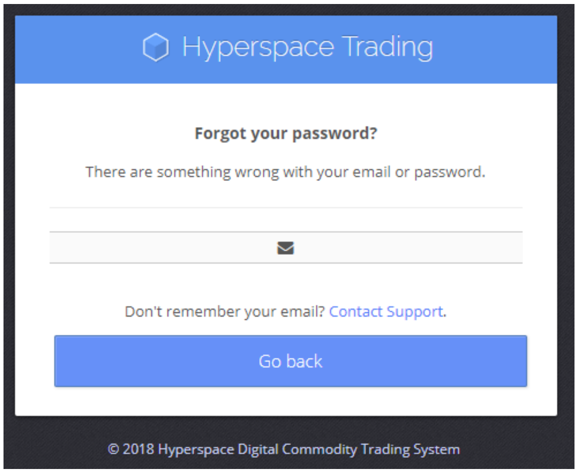

Forgot your password?

There are something wrong with your email or password.

Don't remember your email? Contact Support.

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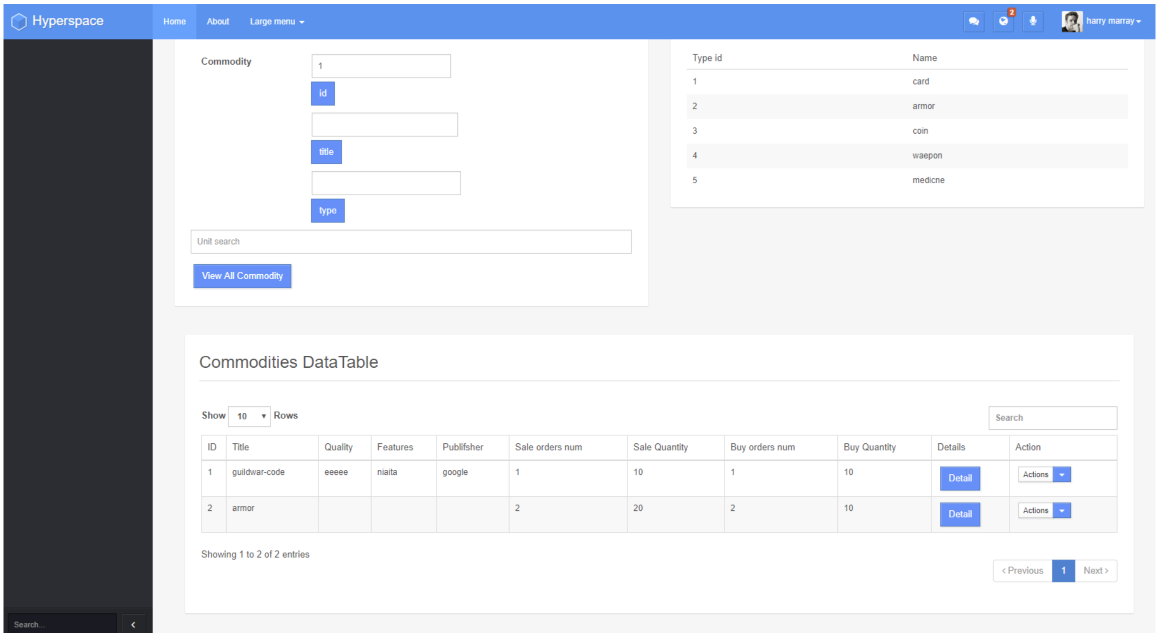
d) Commodity list

After landing, the details list will be displayed and more details will be displayed. If you click the corresponding details button, you can display all the information of the corresponding merchandise. Administrators can modify and delete products.



Commodity: 1

Unit search

Type id	Name
1	card
2	armor
3	coin
4	waepon
5	medicne

Commodities DataTable

Show 10 Rows

Search

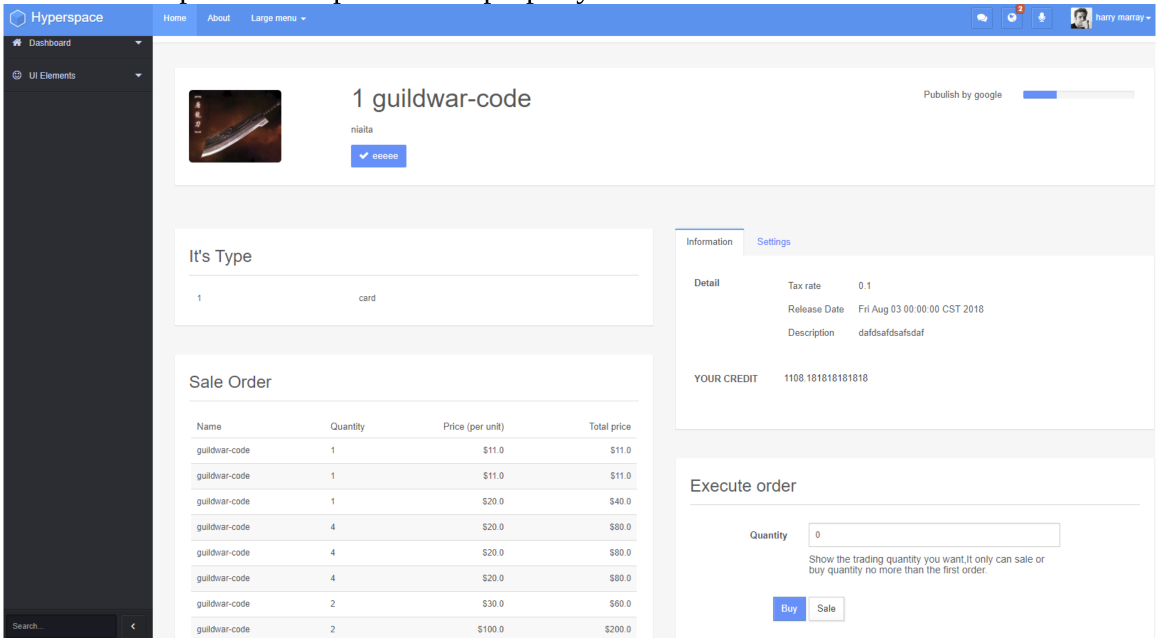
ID	Title	Quality	Features	Publifsher	Sale orders num	Sale Quantity	Buy orders num	Buy Quantity	Details	Action
1	guildwar-code	eeeee	niaita	google	1	10	1	10	Detail	Actions
2	armor				2	20	2	10	Detail	Actions

Showing 1 to 2 of 2 entries

‹ Previous 1 Next ›

e) Commodity detail and Orders

This will display specific product information and orders for each release. Here, traders and administrators can issue orders or execute orders. When the order is executed, the individual credit is judged to be sufficient, and if so, the corresponding goods are executed and put into the purchaser's property.



1 guildwar-code

niaita

✓ eeeee

Pubulish by google

It's Type

1	card

Sale Order

Name	Quantity	Price (per unit)	Total price
guildwar-code	1	$11.0	$11.0
guildwar-code	1	$11.0	$11.0
guildwar-code	1	$20.0	$40.0
guildwar-code	4	$20.0	$80.0
guildwar-code	4	$20.0	$80.0
guildwar-code	4	$20.0	$80.0
guildwar-code	2	$30.0	$60.0
guildwar-code	2	$100.0	$200.0

Detail

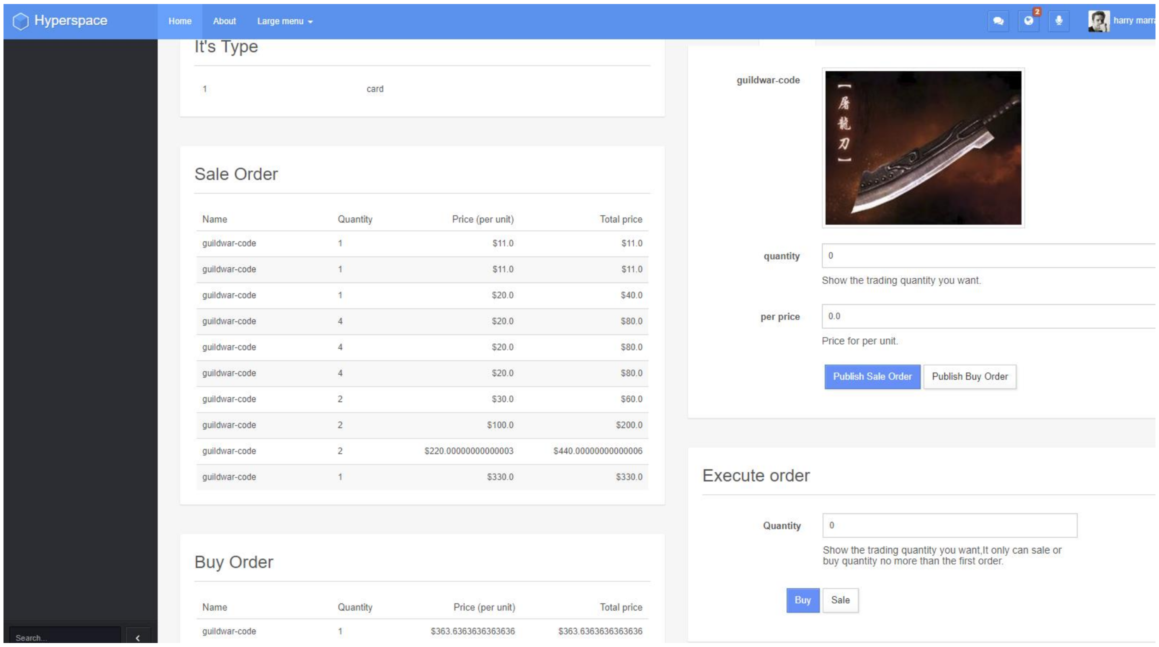
Tax rate	0.1
Release Date	Fri Aug 03 00:00:00 CST 2018
Description	dafdsafdsafsdaf

YOUR CREDIT 1108.181818181818

Execute order

Quantity: 0

Show the trading quantity you want,It only can sale or buy quantity no more than the first order.



It's Type

1 card

Sale Order

Name	Quantity	Price (per unit)	Total price
guildwar-code	1	$11.0	$11.0
guildwar-code	1	$11.0	$11.0
guildwar-code	1	$20.0	$40.0
guildwar-code	4	$20.0	$80.0
guildwar-code	4	$20.0	$80.0
guildwar-code	4	$20.0	$80.0
guildwar-code	2	$30.0	$60.0
guildwar-code	2	$100.0	$200.0
guildwar-code	2	$220.00000000000003	$440.00000000000006
guildwar-code	1	$330.0	$330.0

Buy Order

Name	Quantity	Price (per unit)	Total price
guildwar-code	1	$363.6363636363636	$363.6363636363636

guildwar-code

quantity: 0

Show the trading quantity you want.

per price: 0.0

Price for per unit.

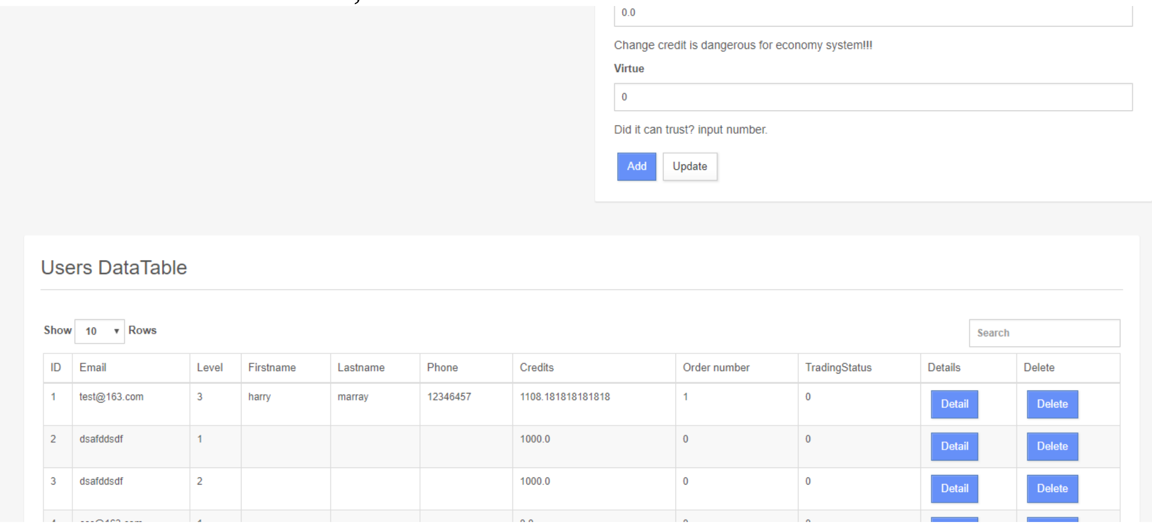
Execute order

Quantity: 0

Show the trading quantity you want,It only can sale or buy quantity no more than the first order.

f) User control

Administrators can enter this page, find users through a variety of methods, and modify user information. Of course, he can also increase users.


0.0

Change credit is dangerous for economy system!!!

Virtue

0

Did it can trust? input number.

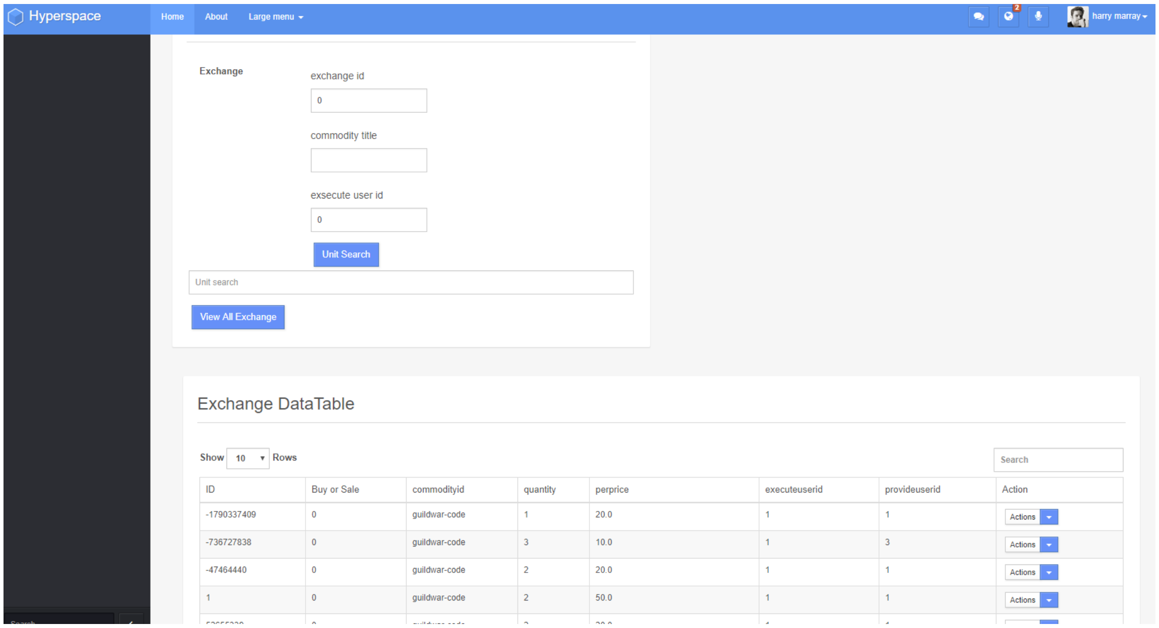
Users DataTable

Show 10 Rows

ID	Email	Level	Firstname	Lastname	Phone	Credits	Order number	TradingStatus	Details	Delete
1	test@163.com	3	harry	marray	12346457	1108.181818181818	1	0	Detail	Delete
2	dsafddsdf	1				1000.0	0	0	Detail	Delete
3	dsafddsdf	2				1000.0	0	0	Detail	Delete

g) Exchange search

Administrators can go to this page to view executed orders, multiple lookups for specific orders, and see the profits.



Exchange

exchange id: 0

commodity title:

exsecute user id: 0

Unit search

Exchange DataTable

Show 10 Rows

Search

ID	Buy or Sale	commodityid	quantity	perprice	executeuserid	provideuserid	Action
-1790337409	0	guildwar-code	1	20.0	1	1	Actions
-736727838	0	guildwar-code	3	10.0	1	3	Actions
-47464440	0	guildwar-code	2	20.0	1	1	Actions
1	0	guildwar-code	2	50.0	1	1	Actions