Report of SMS Website(DBI CW2)

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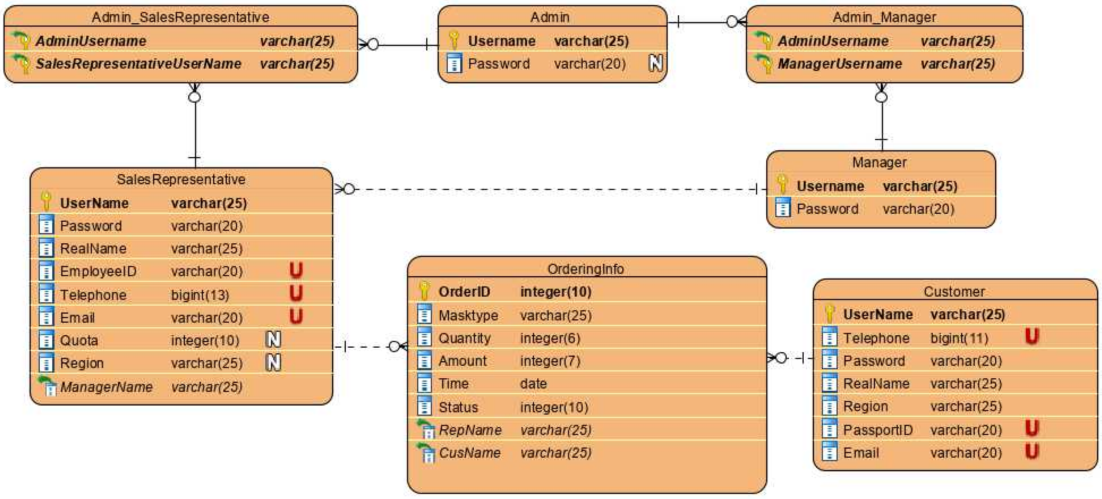
1 ER Diagram



This is my Entity-Relationship Diagram. After analysis, I decided to use five entities for the requirements which are Customer,Manager,Admin, Sales Representative and OrderingInfo. The other two tables between Admin and Manager, between Admin and Representative are generated because of the many-to-many relationship between these two entities. Region and quota feature of **Sales Representative** can be null because one new representative may not be assigned immediately. It may take some time for new representatives to be trained and after that they should be allowed to begin the actual work. The relationships between each entities are clearly showed in the diagram.

2 SQL statements

```
CREATE TABLE Manager(
  Username varchar(25) primary key,
    Password varchar(25)
);
CREATE TABLE Customer(
  UserName varchar(25) primary key,
    Telephone bigint unique,
    Password  varchar(20),
    RealName varchar(25),
    Region varchar(25),
    PassportID varchar(20) unique,
    Email  varchar(20) unique
 );
  CREATE TABLE SalesRepresentative(
  UserName varchar(25) primary key,
    Password  varchar(20),
    RealName varchar(25),
    EmployeeID varchar(20) unique,
    Telephone bigint unique,
    Email  varchar(20) unique,
    Quota int(10) null,
    Region varchar(25) null,
    ManagerName  varchar(25),
    constraint managerNameref
    foreign key (ManagerName)
        REFERENCES Manager (UserName)
      ON DELETE SET NULL
            ON UPDATE CASCADE
```

```
);
CREATE TABLE OrderingInfo(
 OrderID integer(10) primary key,
   Masktype varchar(25),
   Quantity integer(6),
   Amount integer(7),
   Time date,
   Status integer(10),
   RepName varchar(25),
   CusName varchar(25),
   constraint repNameref
   foreign key (RepName)
       REFERENCES SalesRepresentative (UserName)
     ON DELETE SET NULL
           ON UPDATE CASCADE,
 constraint cusNameref
   foreign key (CusName)
       REFERENCES Customer (UserName)
     ON DELETE SET NULL
           ON UPDATE CASCADE
);
CREATE TABLE Admin(
 Username varchar(25) primary key,
   Password varchar(25)
);
CREATE TABLE Admin_SalesRepresentative(
 AdminUsername  varchar(25),
   SalesRepresentativeUserName varchar(25),
    constraint adNameref
   foreign key (AdminUsername)
       REFERENCES Admin (UserName)
     ON DELETE SET NULL
           ON UPDATE CASCADE,
  constraint salesrepNameref
   foreign key (SalesRepresentativeUserName)
       REFERENCES SalesRepresentative (UserName)
     ON DELETE SET NULL
           ON UPDATE CASCADE
);
 CREATE TABLE Admin_Manager(
 AdminUsername  varchar(25),
   ManagerUserName varchar(25),
    constraint admNameref
   foreign key (AdminUsername)
       REFERENCES Admin (UserName)
     ON DELETE SET NULL
           ON UPDATE CASCADE,
  constraint managNameref
   foreign key (ManagerUserName)
       REFERENCES Manager (UserName)
     ON DELETE SET NULL
           ON UPDATE CASCADE
);
```

Listing 1: create-table statements

3 Walk-through in the system

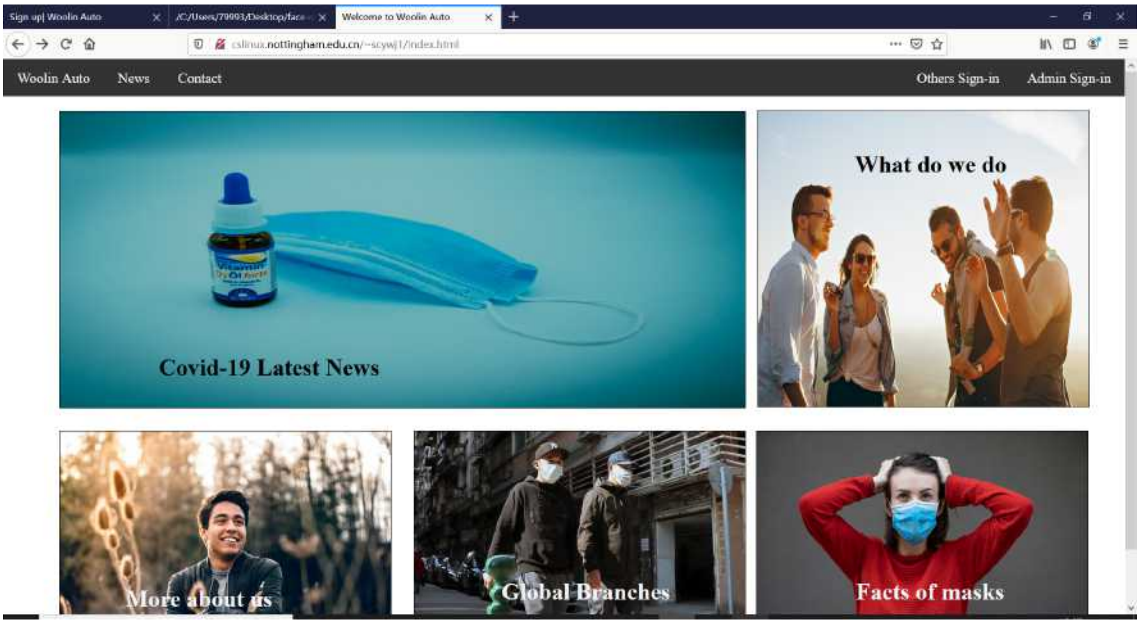


Figure 1: register page

This is the home page of Woolin Auto company. It displays several sections that shows different functions such as Covid-19 news, Global branches introduction etc. Administrator could sign in using the *Admin Sign-in* channel and other users(customers, representatives and manager) could sign into the system by using *Others sign-in* channel.

Figure 2: log-in page

this is the log-in page of the system. There are three lines for user to choose/fill in this page. In the *sign in* row, user should choose the role they are going to sign in, which are *Customer,Sales Representative, Manager* respectively.After entering the username and password, the website will jump into three different pages with different functionalities for these three roles.

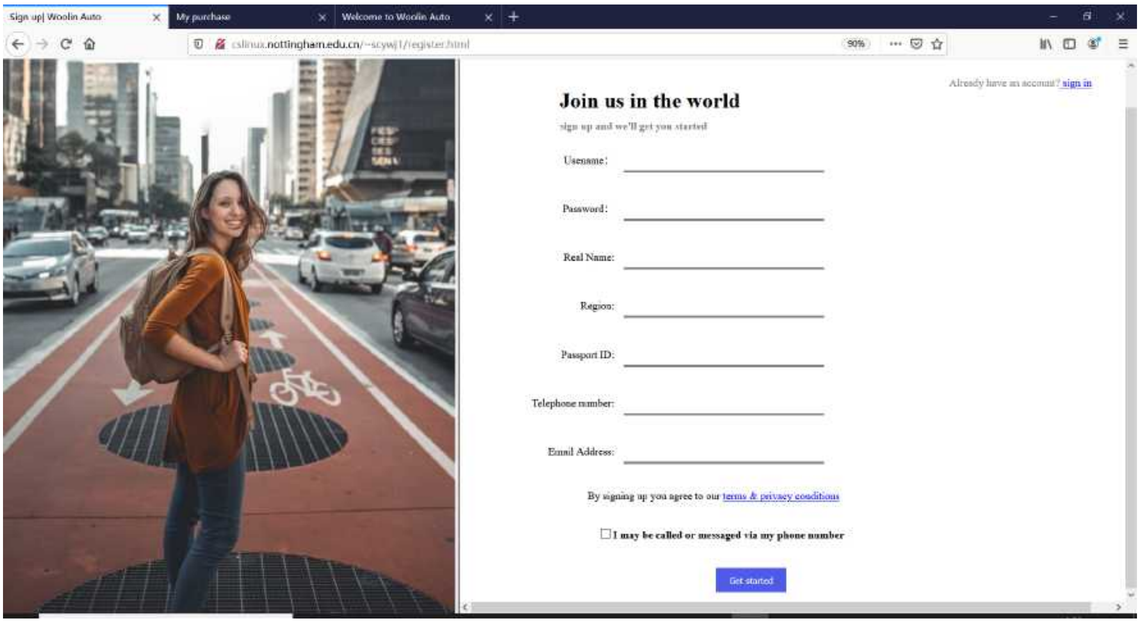


Figure 3: register page

This is the register page for customers, the register form implements javascript validation skills and all the data will be posted to php and insert into database.

3.1 Customer

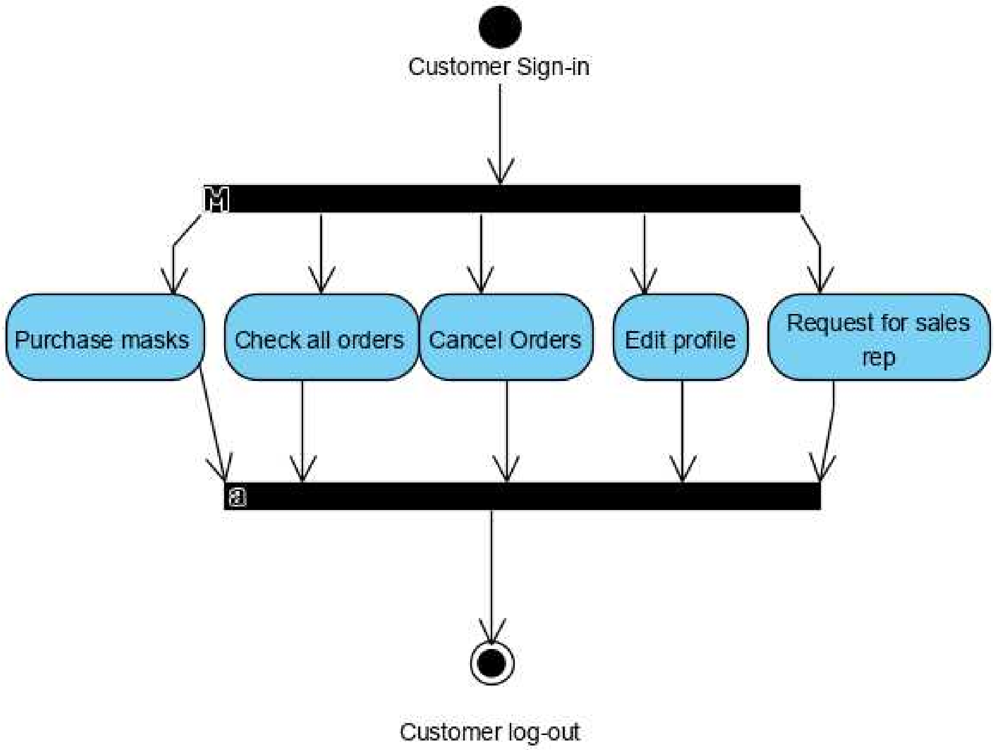


Figure 4: What Customer can do

The above activity diagram briefly demonstrates what customer can do in this system. The detailed procedure will be explained in the following part of the section.

Figure 5: select type and quantity

Figure 6: select representative

First I will show you the functionalities of customer. After logging, the purchase interface will be displayed directly for customer. Customer can select mask type(by clicking the drop-down list), enter number of masks he/she is willing to purchase and select a representative with sufficient quota.

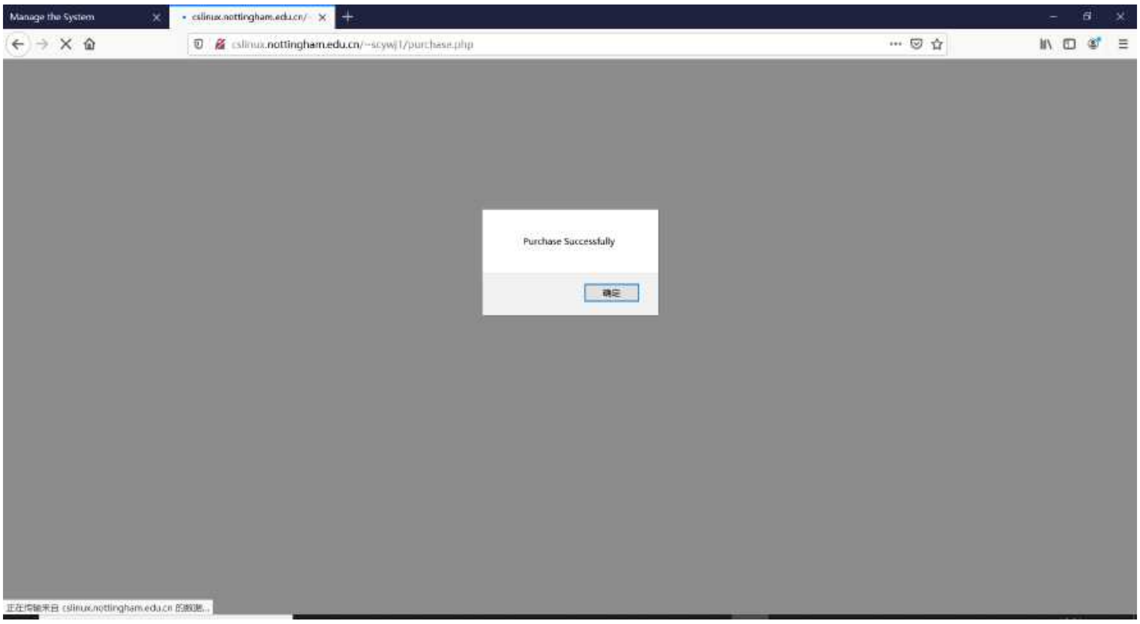


Figure 7: Purchase successfully

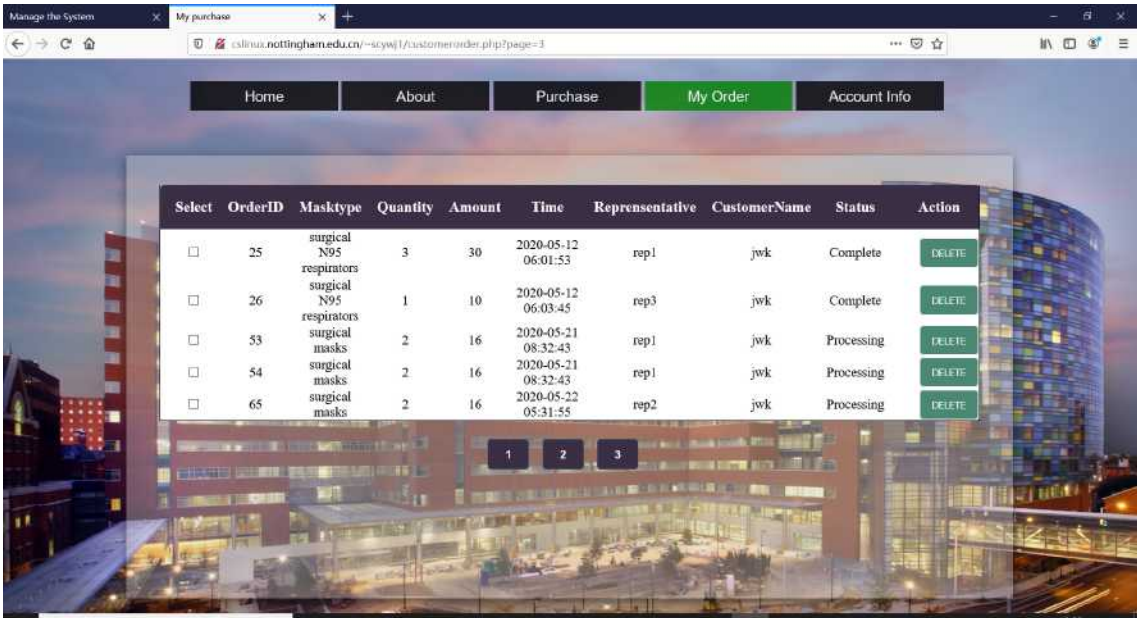


Figure 8: Purchase successfully

The system will prompt a message if the purchase is processed without anomaly and the website will jump to the **order page** where you can monitor all your orders(status in complete,processing and anomaly)

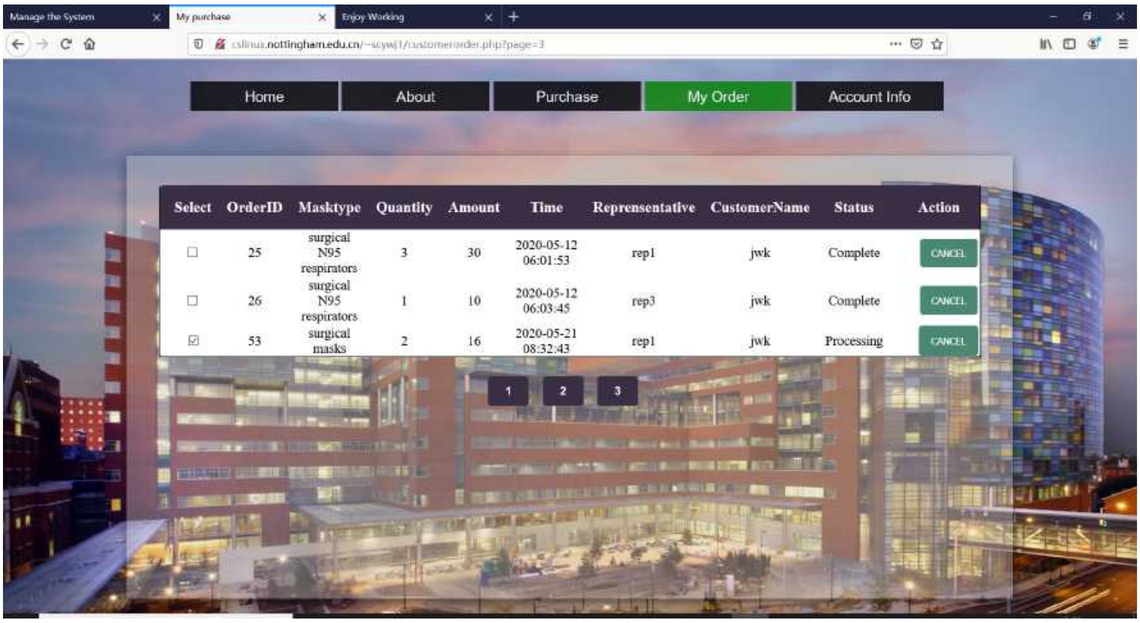


Figure 9: Cancel orders

Every user is able to cancel orders within 24h. If the time exceeds 24 hours, the order is treated as complete and sold therefore the status of these orders will turn into complete. For canceling orders, user should **tick** the checkbox in the first column and then press the **cancel** button. By doing so, the order will be canceled and deleted in the table.

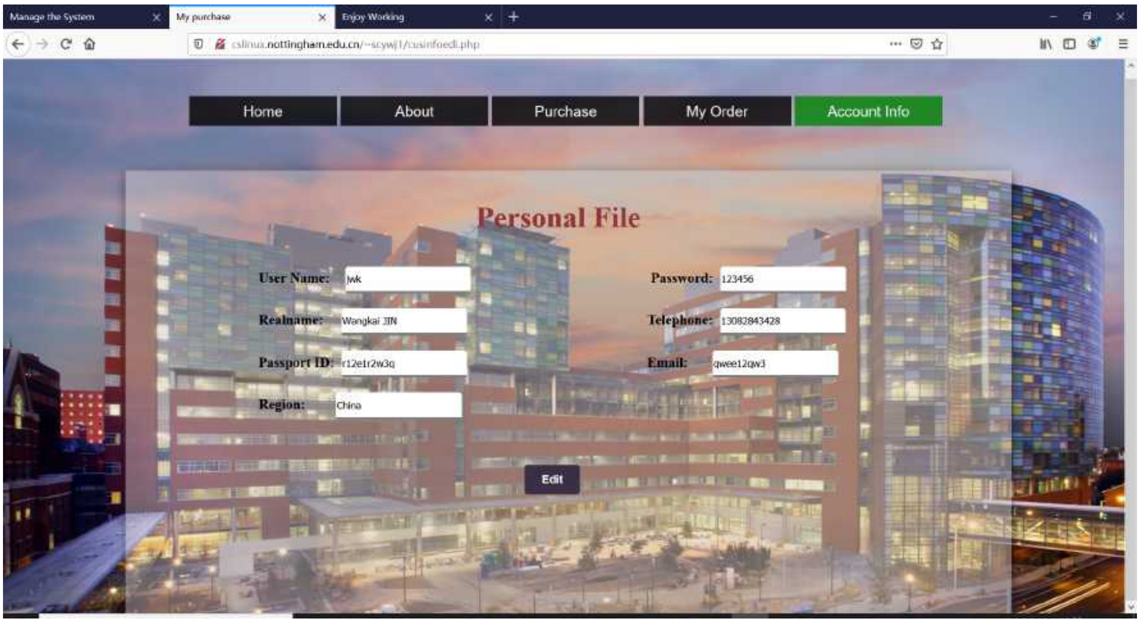


Figure 10: Modify personal file

Customers are also allowed to edit their personal files by clicking **Account Info** in the rightmost column in the navigation bar. They are allowed to modify the personal information multiple times but only limited to *password,telephone, email and region*. Other information should be filled correctly when registering.

That's all the basic functionalities for customers. In the next section, I will show you the what sales representatives can do in the system.

3.2 Sales Representative

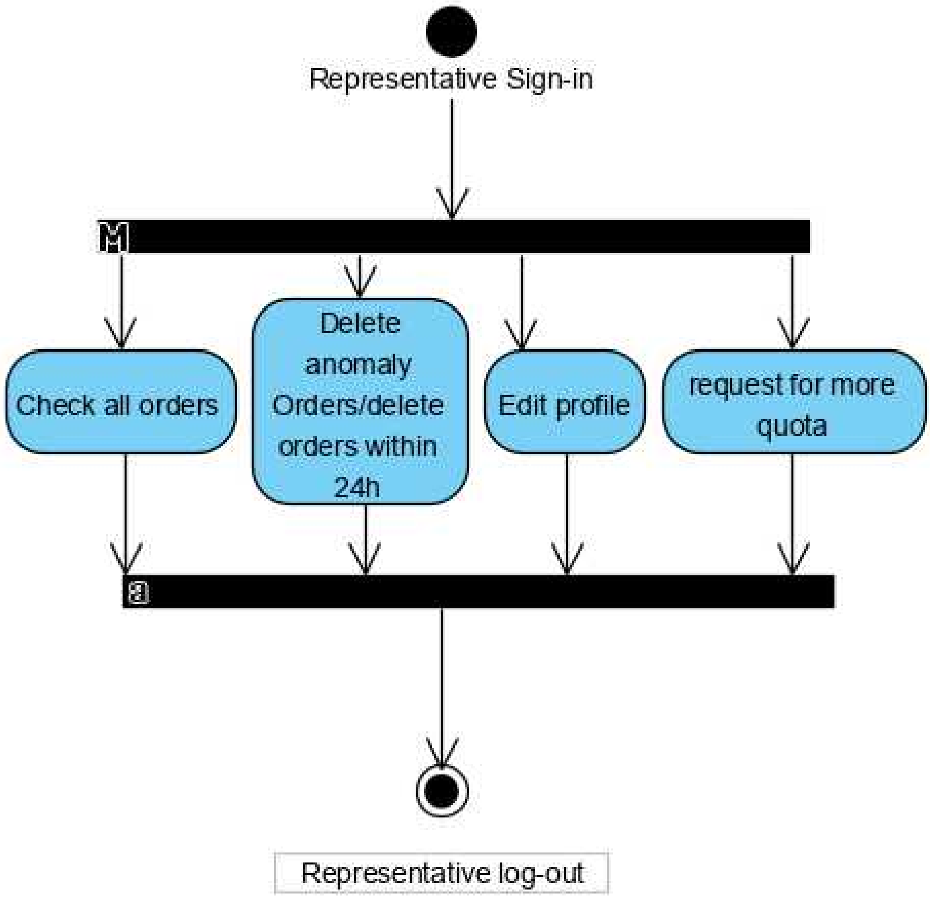


Figure 11: What Sales Representatives can do

The above activity diagram briefly demonstrates what sales representatives can do in this system. The detailed procedure will be explained in the following part of the section.

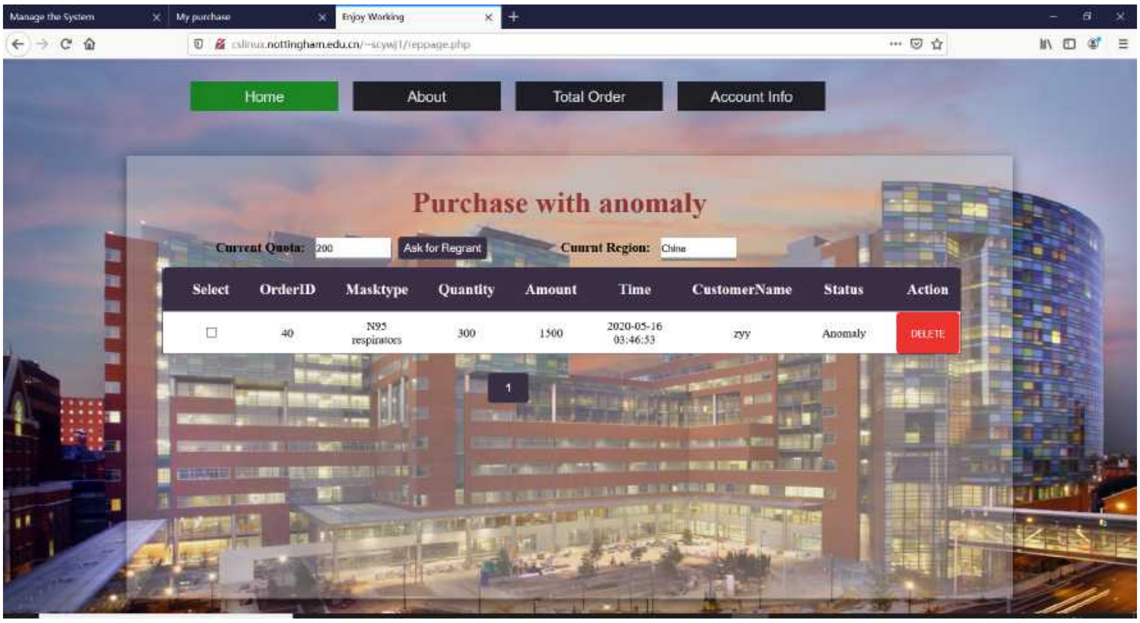


Figure 12: Representative home page

After signing in as a sales representatives,the home page of a sales representative is displayed above. In this page, representatives can receive all the anomaly orders and they are supposed to delete all the anomaly orders within 24 hours to prevent potential loss of the company. The deletion process is same as the deletion process in *customerorder page*, first you need to tick the check box and then press the **delete** button.

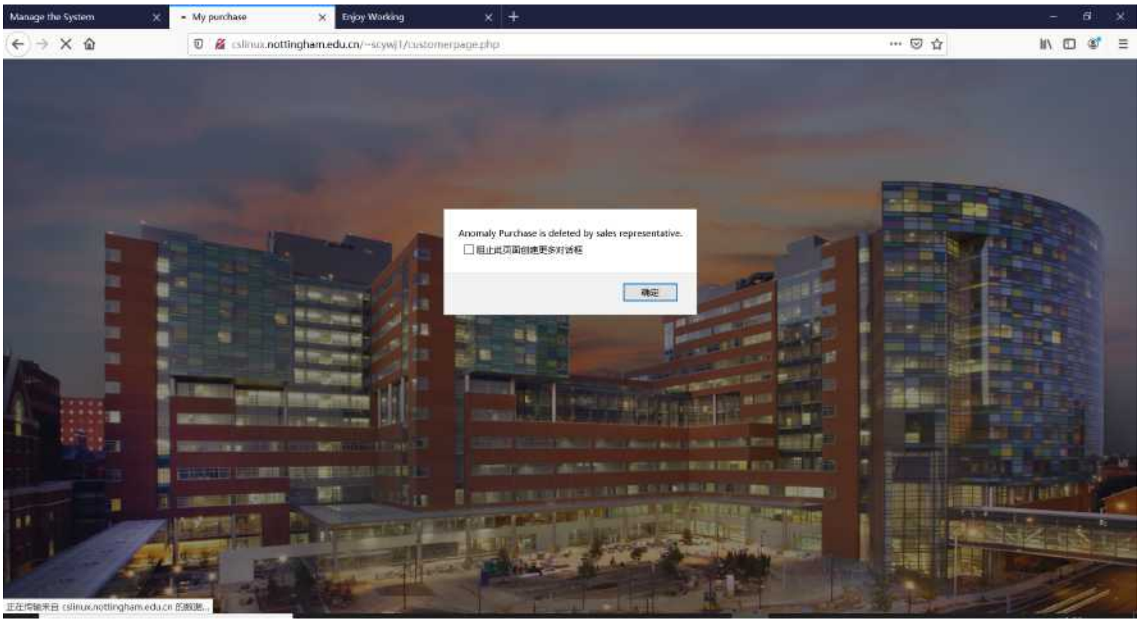


Figure 13: Message received by customer

After deletion, the customer who ordered the anomaly order will receive a message next time he/she logs in.

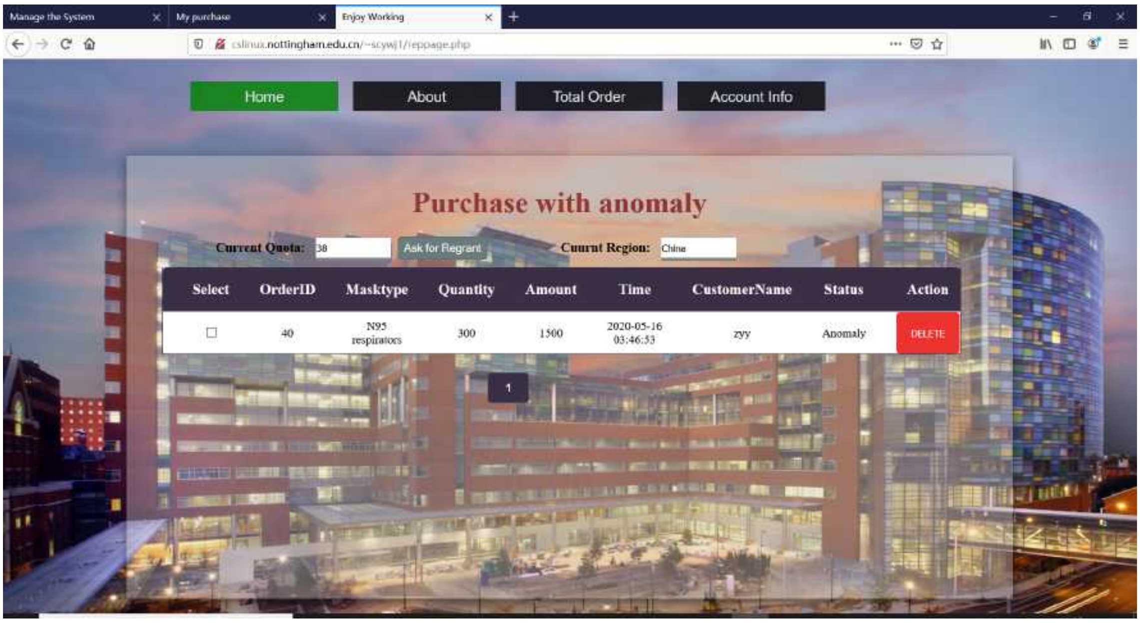


Figure 14: Request for re-grant

Other than displaying the anomaly order information. Sales Representatives can also check current quota/region and send request for more quota to manager by clicking on the *Ask for Regrant* button. After the message is sent to manager, the website will prompt a message saying the request is sent.

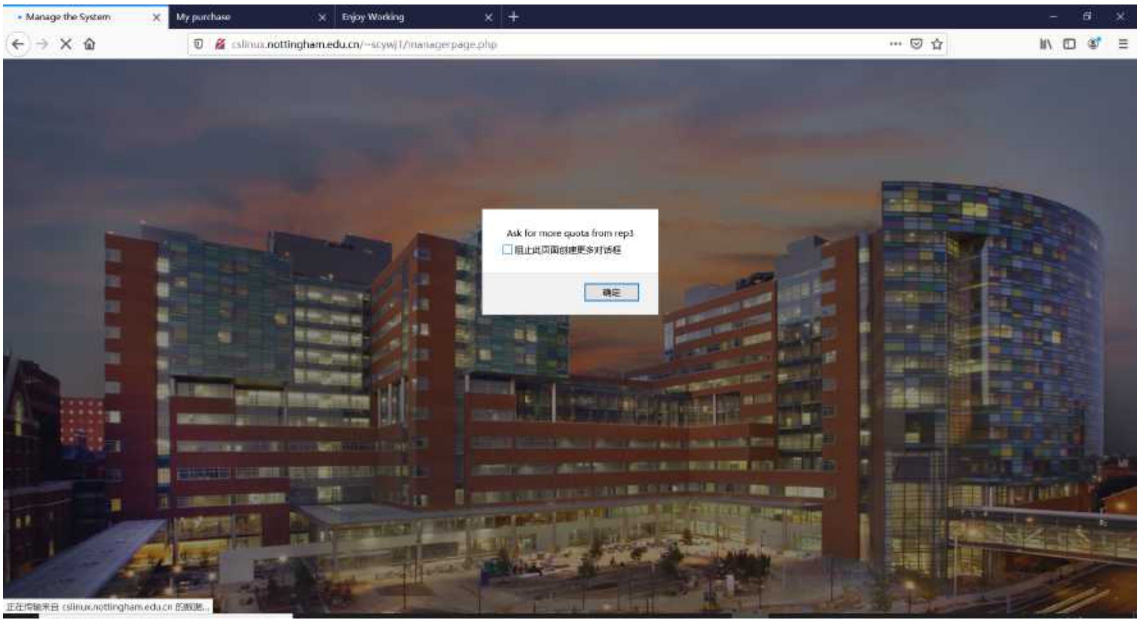


Figure 15: Request for re-grant

All that representatives can do is to wait for manager to assign a new quota to him/her so that customers can order masks.

Sales representatives can view all the orders that he/she is in charge of by clicking the *Total Order* button in navigation bar, all the orders, no matter they are anomaly or not, will be displayed and representatives can operate legal deletion on these records.

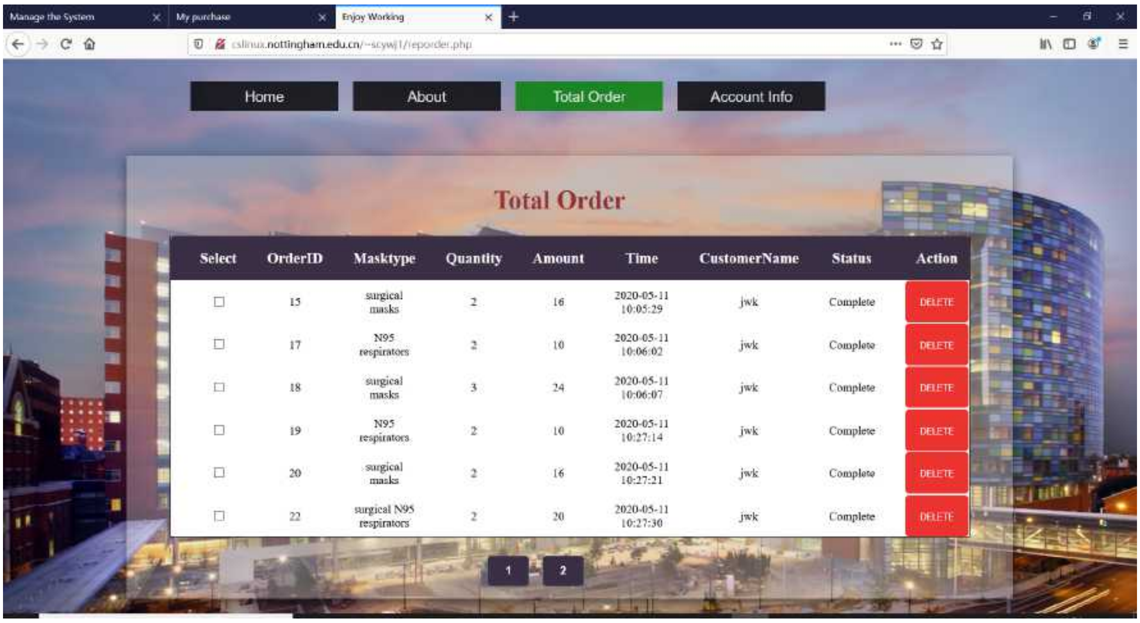


Figure 16: Total order

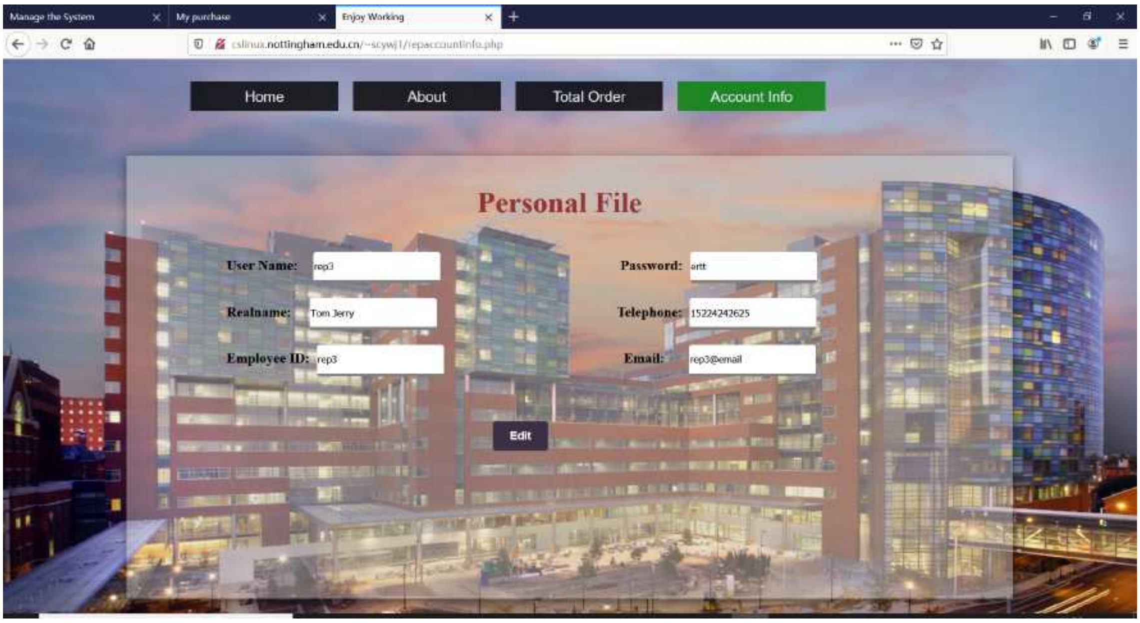


Figure 17: Profile Edition

Sales representatives are also allowed to modify their personal information. The procedure and limitations are same as customers'.

That's all the basic functionalities for Sales Representatives. The next sections will cover various functions of manager role.

3.3 Manager

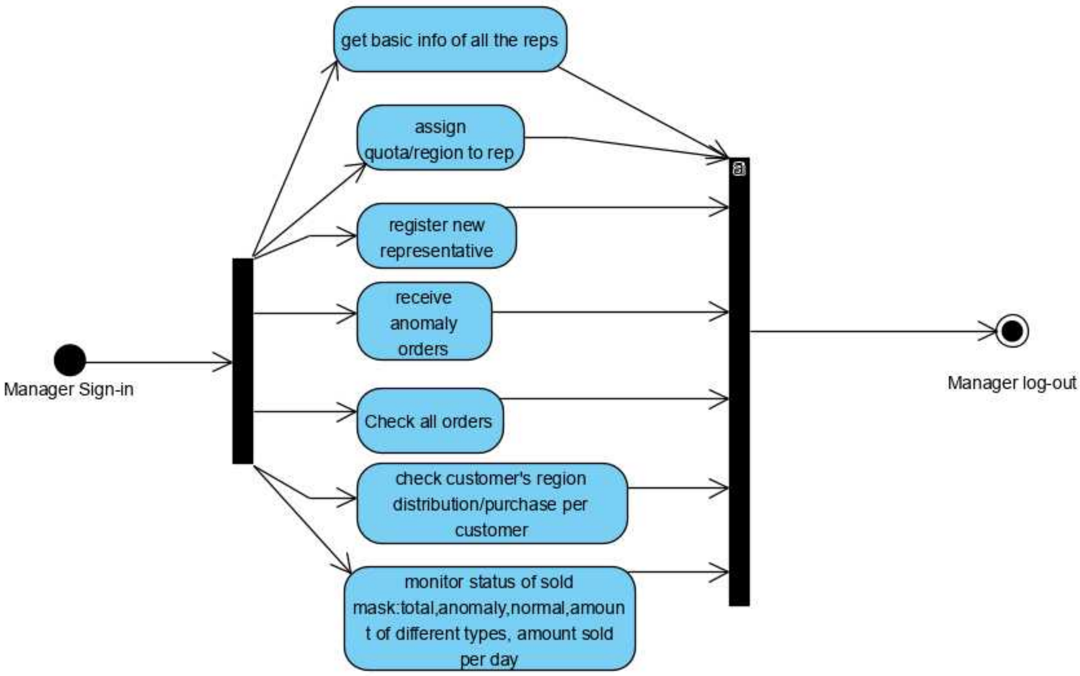


Figure 18: Total order

The above activity diagram briefly demonstrates what manager can do in this system. The detailed procedure will be explained in the following part of the section.

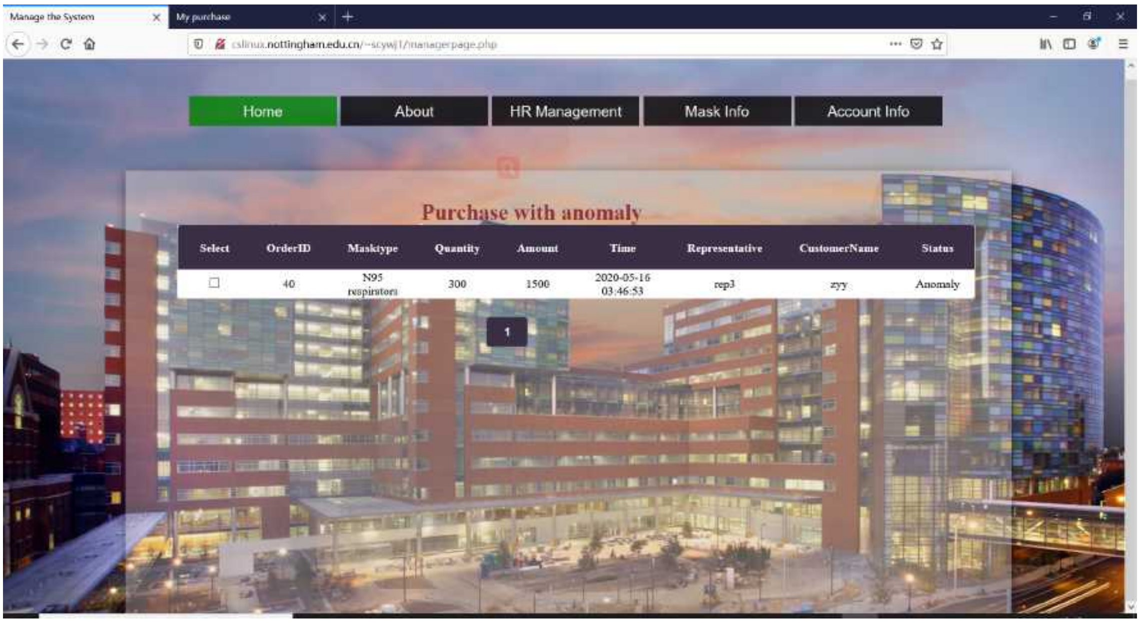


Figure 19: Total order

After signing in, manager is supposed to be notified of the anomaly orders which exceed 24 hours time limits at the first time. Therefore, the home page of manager is to display these anomaly orders.

In this system, I classified the functionalities of manager into two general aspects which are *HR Management* and *Mask Info* respectively. Further classification can be viewed when hovering the mouse on these two navigation bar block

HR Management

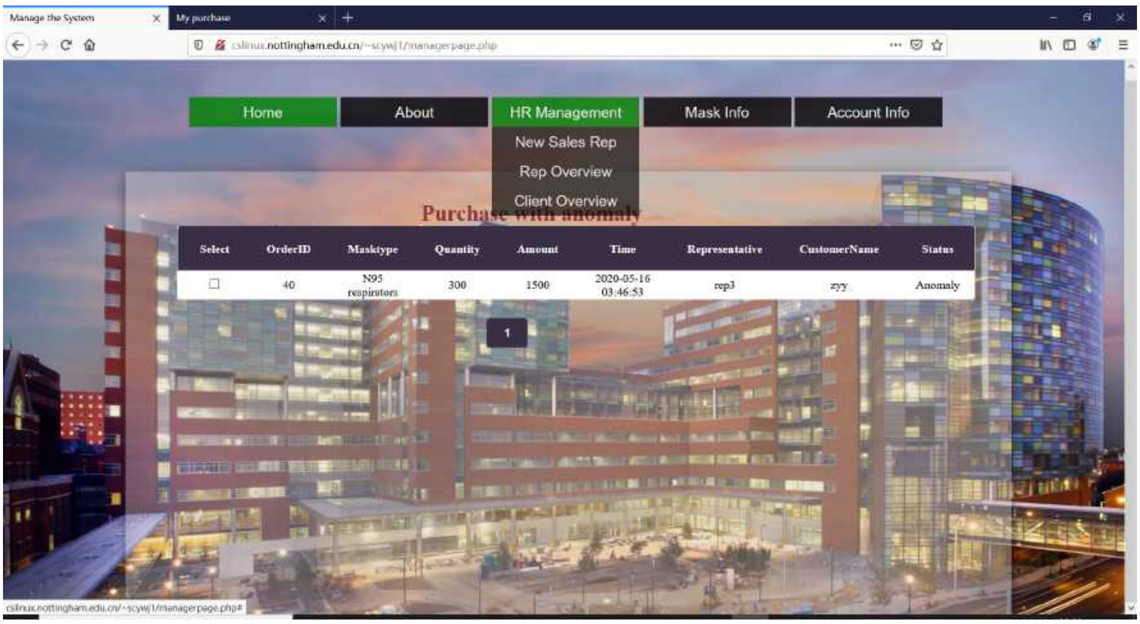


Figure 20: Functions in HR Management

In *HR Management* section, I conclude three functions which are **Registration for new representative, Overview of all representatives and Overview of all customers**

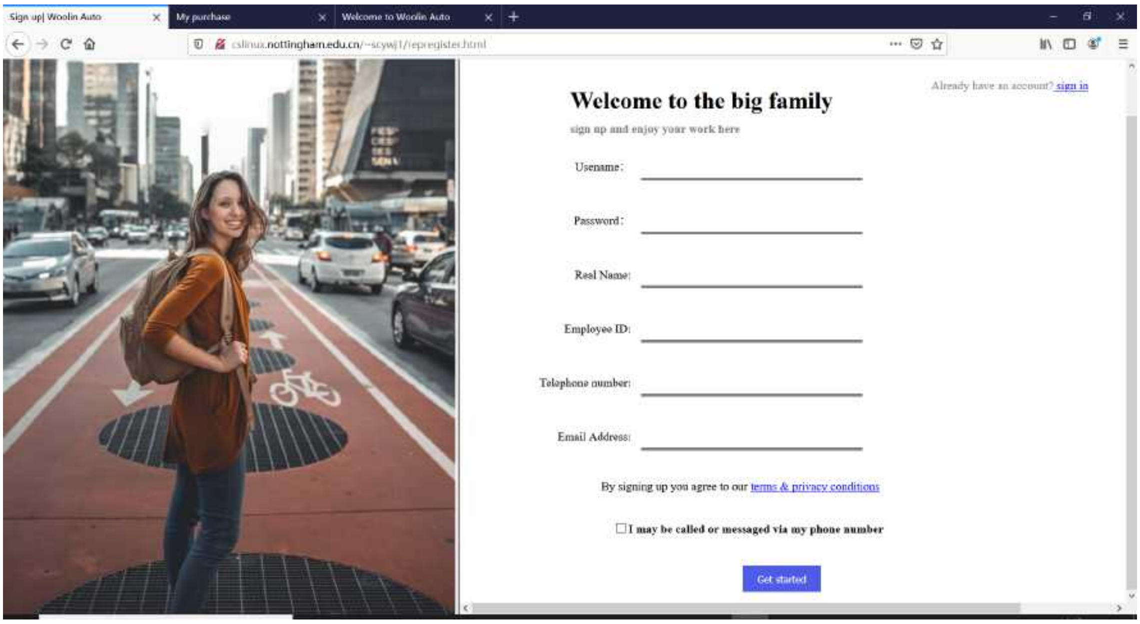


Figure 21: Representative Registration

After clicking *New Sales Rep*, the page will jump to the registration page of representatives. The page is slightly different with customer registration page with same format.

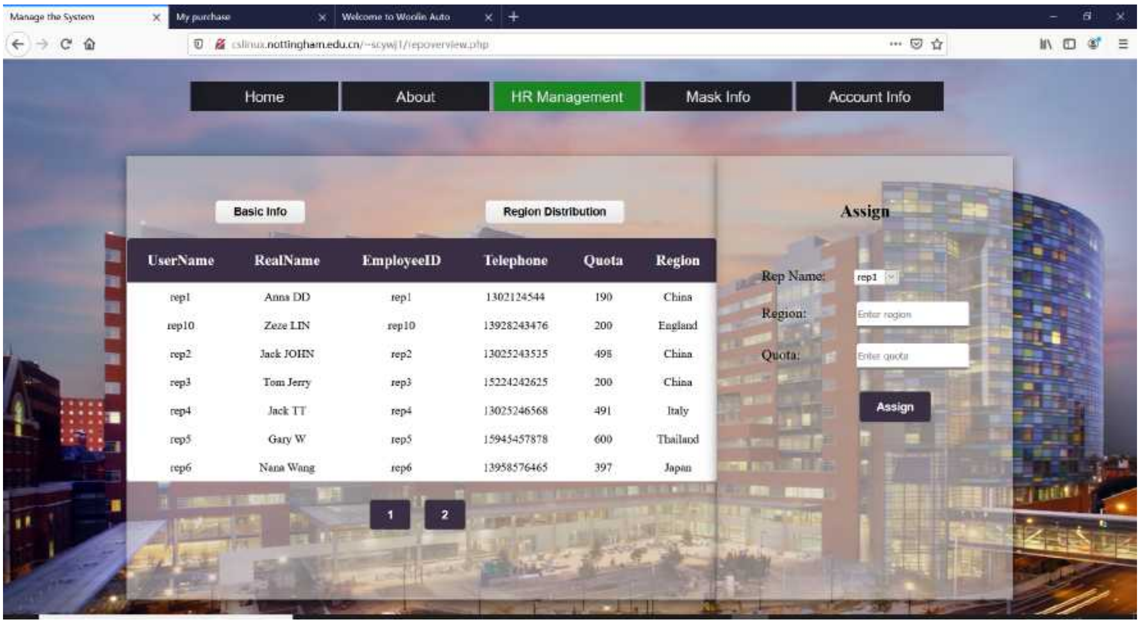


Figure 22: Basic Info about all representatives

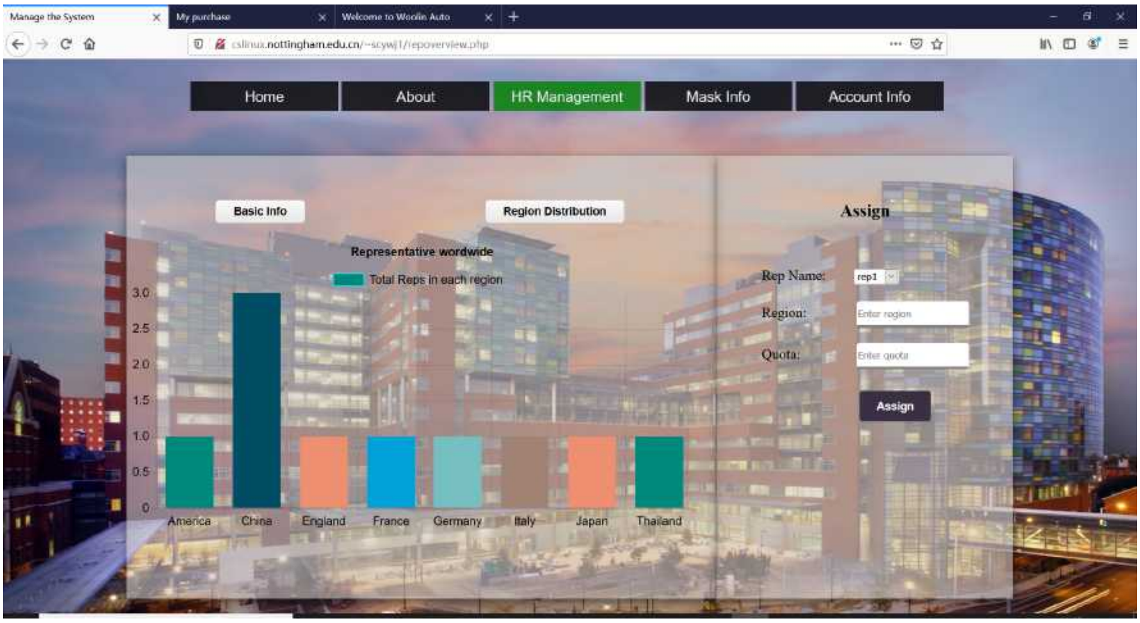


Figure 23: Region Distribution

After clicking *Rep Overview*, the website will jump to the above page. For this section, it has basic functions such as *display of all basic info about sales representatives, display of rep's region distribution and assignment of each reps*. By clicking the float button, you can switch from viewing the table of representatives' information and bar chart of representatives' region distribution.

The form placed in the right part is for assigning region and quota for a particular representative each time.

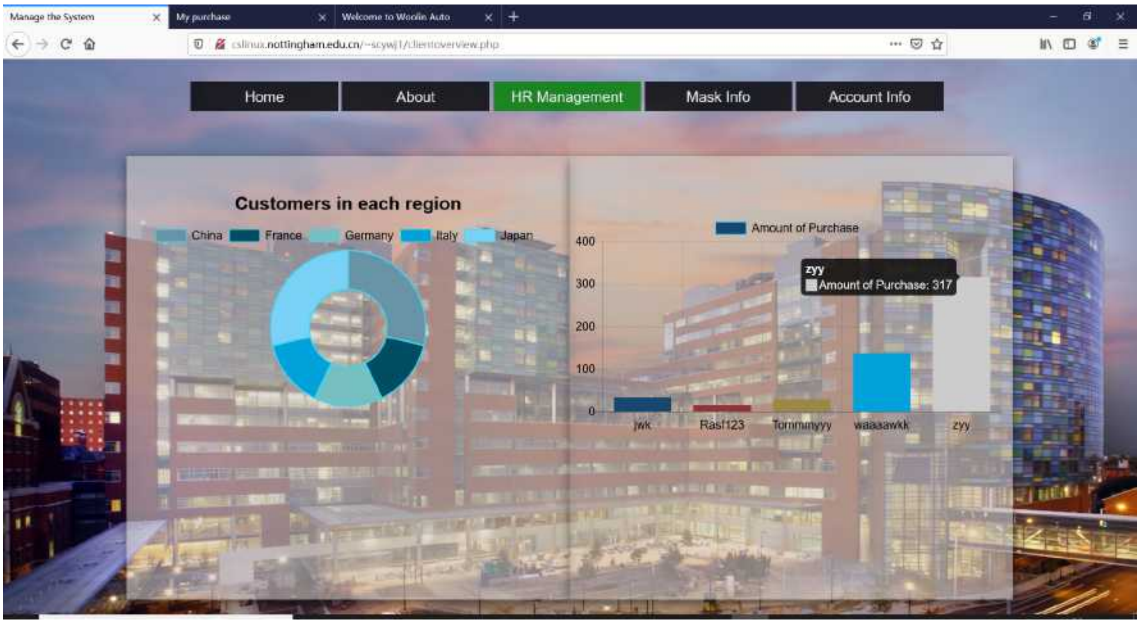


Figure 24: Customer Information Display

By clicking *Customer Overview*, you can access the page that show the statistics of Customers. Current service only allows the display of the total number of customers from same region and amount of purchases ordered by each customers.

Mask Information

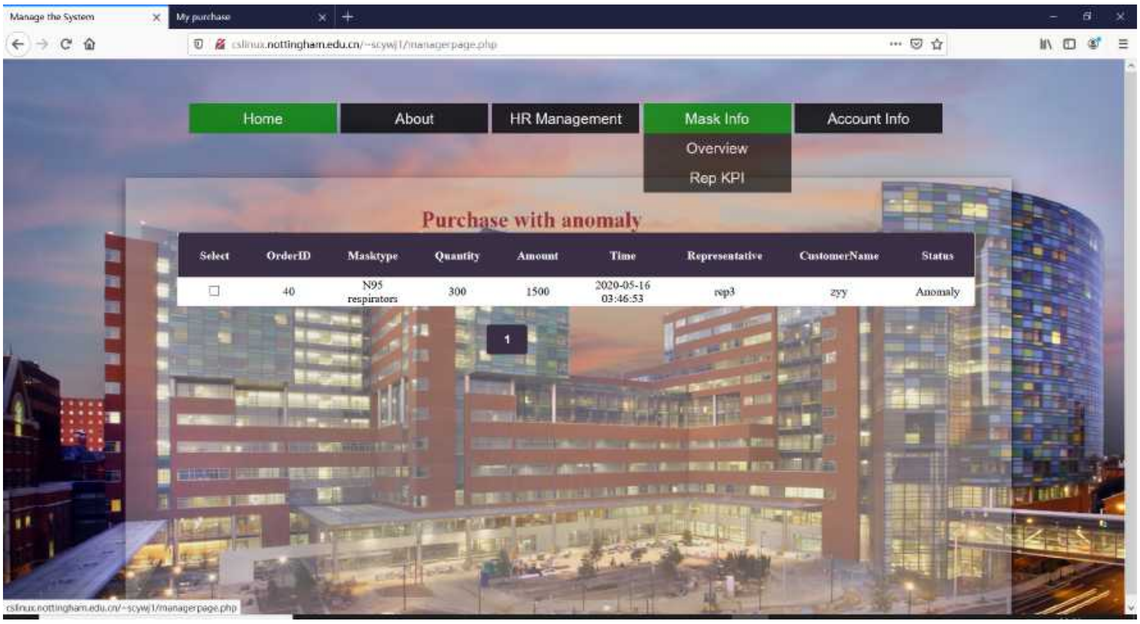


Figure 25: Functions in Mask Info

In *Mask Info*, I include two functions which are **Mask Overview** and **Representative KPI**. Both functions use charts to display data which make the data more readable and comprehensible.

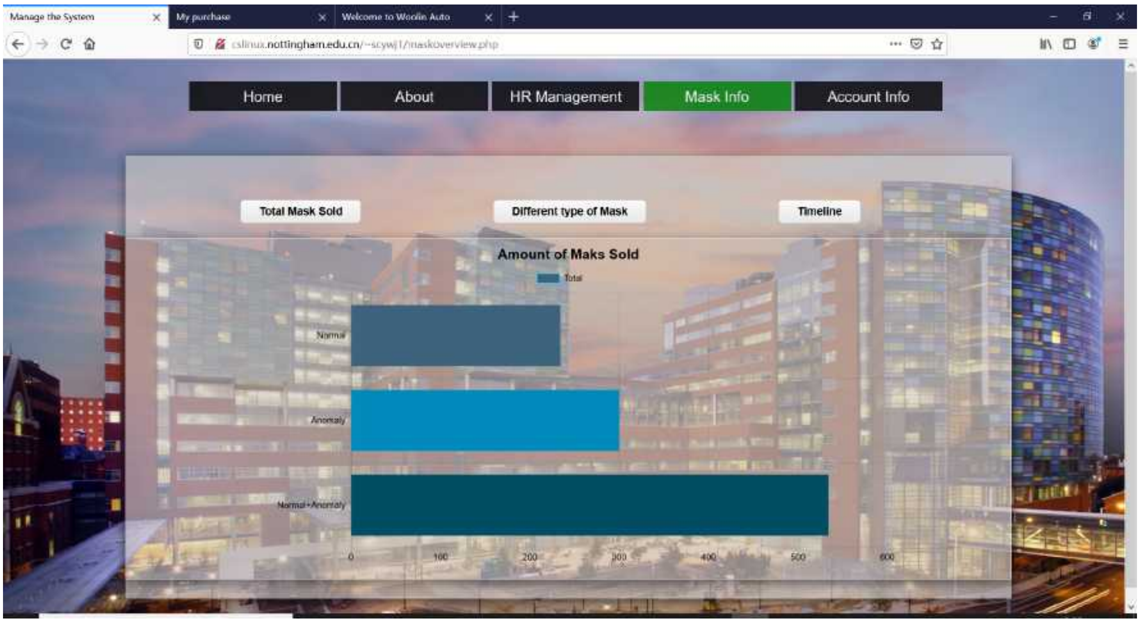


Figure 26: Functions in Mask Info

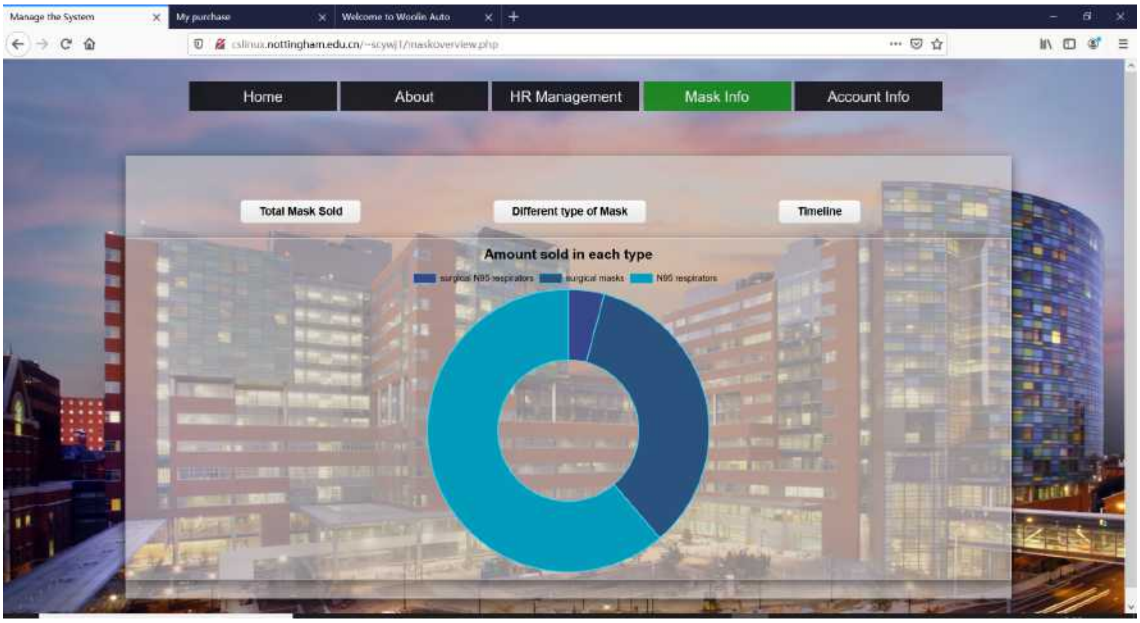


Figure 27: Functions in Mask Info

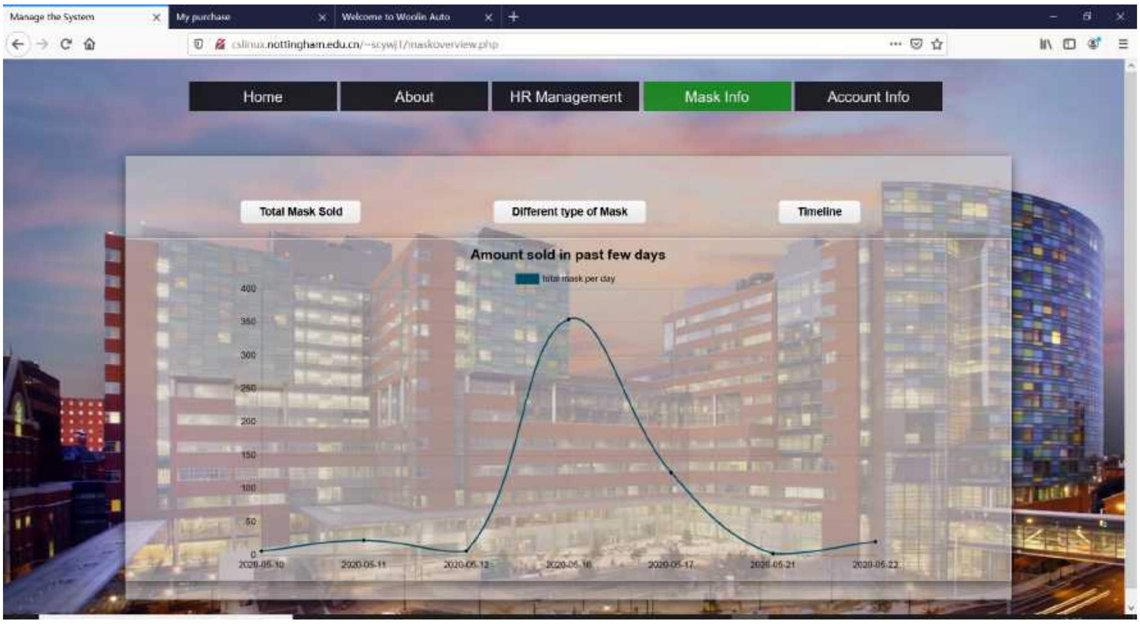


Figure 28: Functions in Mask Info

In the *Mask Overview* section,By clicking three floating buttons, manager can view the different charts that are showing the sold mask information in different conditions.

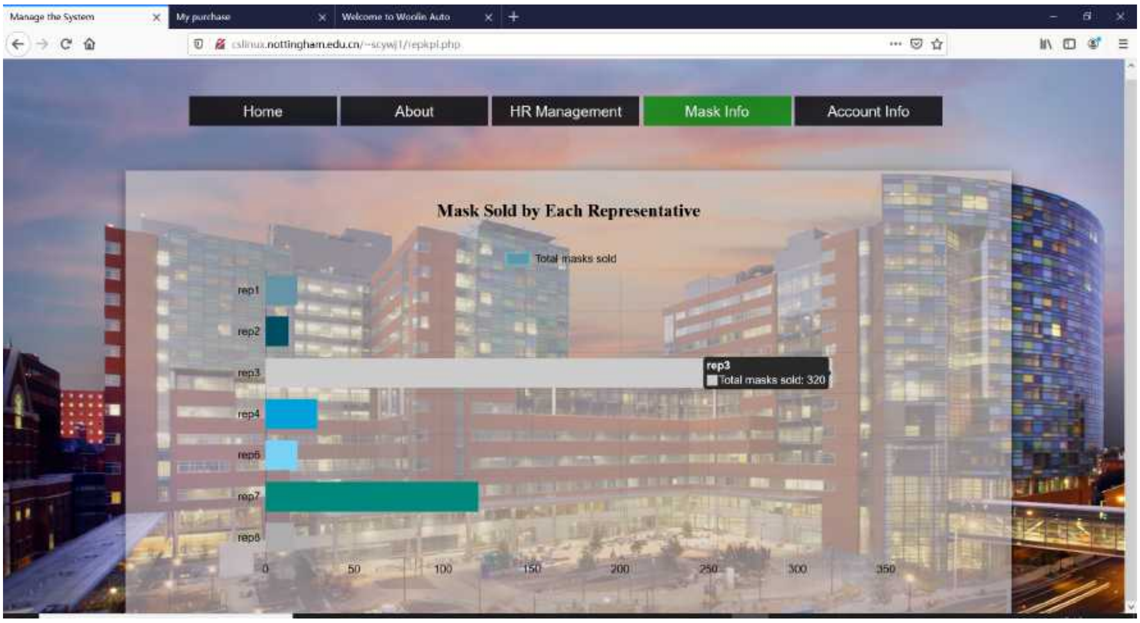


Figure 29: Functions in Mask Info

In the *Rep KPI* section, statistics about masks sold by each representatives is showed in a horizontal bar chart, we can tell from the chart that rep3 is performance is far better than all other colleagues.

The above sections are all the content for manager role. In the next section, I will introduce some interactive activities between these three roles in the system.

3.4 Admin

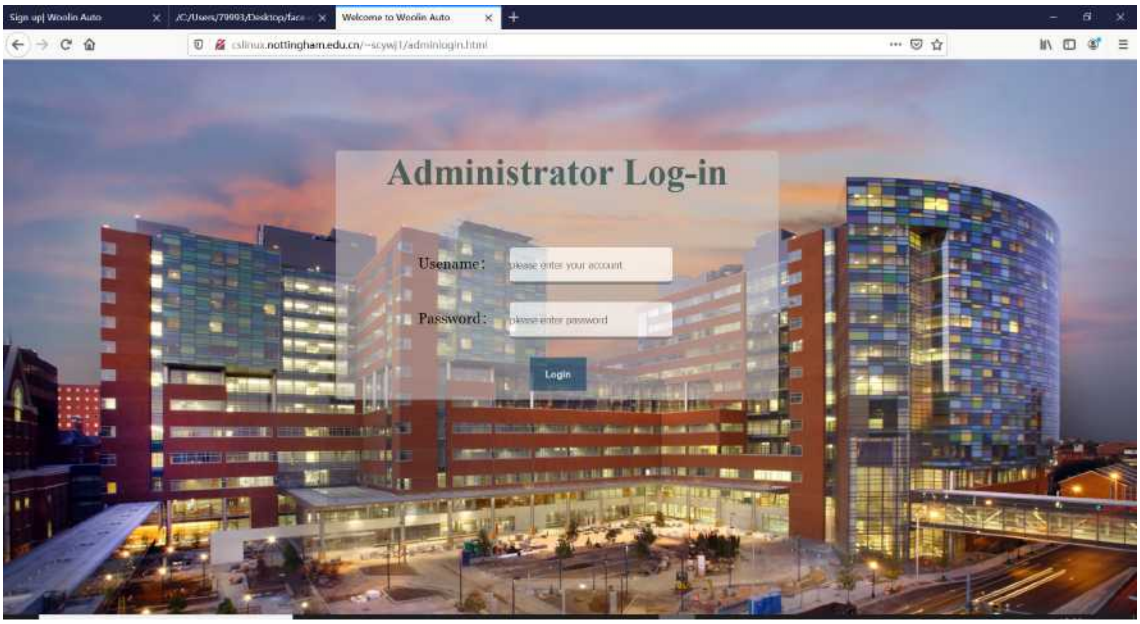


Figure 30: Admin log-in

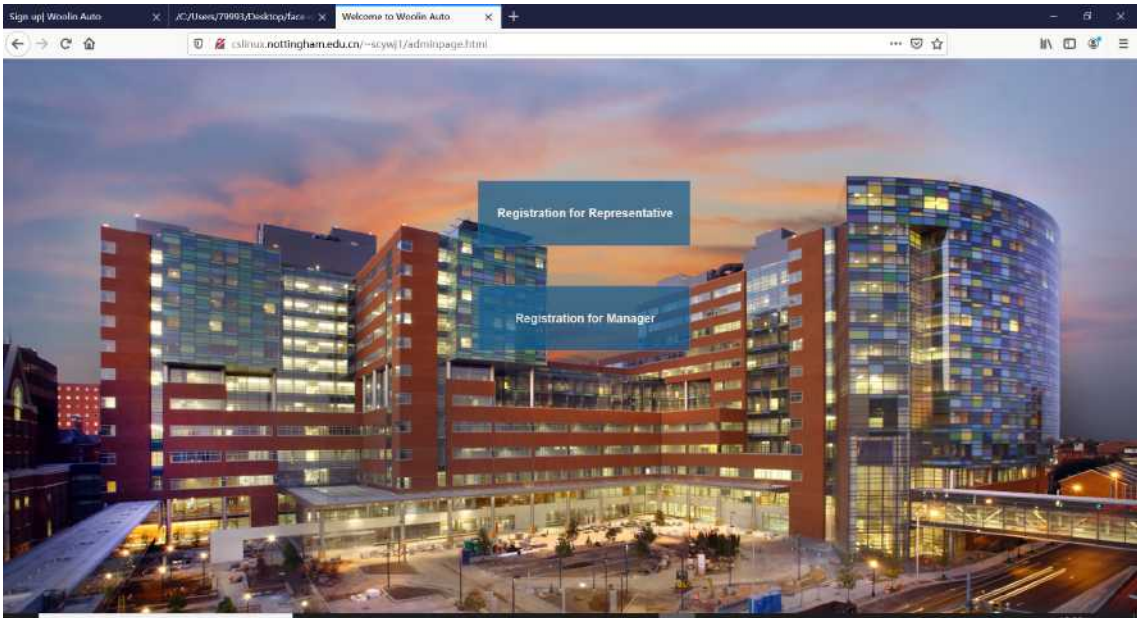


Figure 31: Admin page

Administrators in current system only have basic registration function for managers and sales representatives. By clicking these two buttons, admin can register new managers and sales representatives respectively.

3.5 Interactions between each role

This section will introduce some basic interactions between different users such as sending messages to sales representatives after assigning region/quota or sending messages to manager when user asking for more representatives in that region.

Ask for Sales Representatives From User

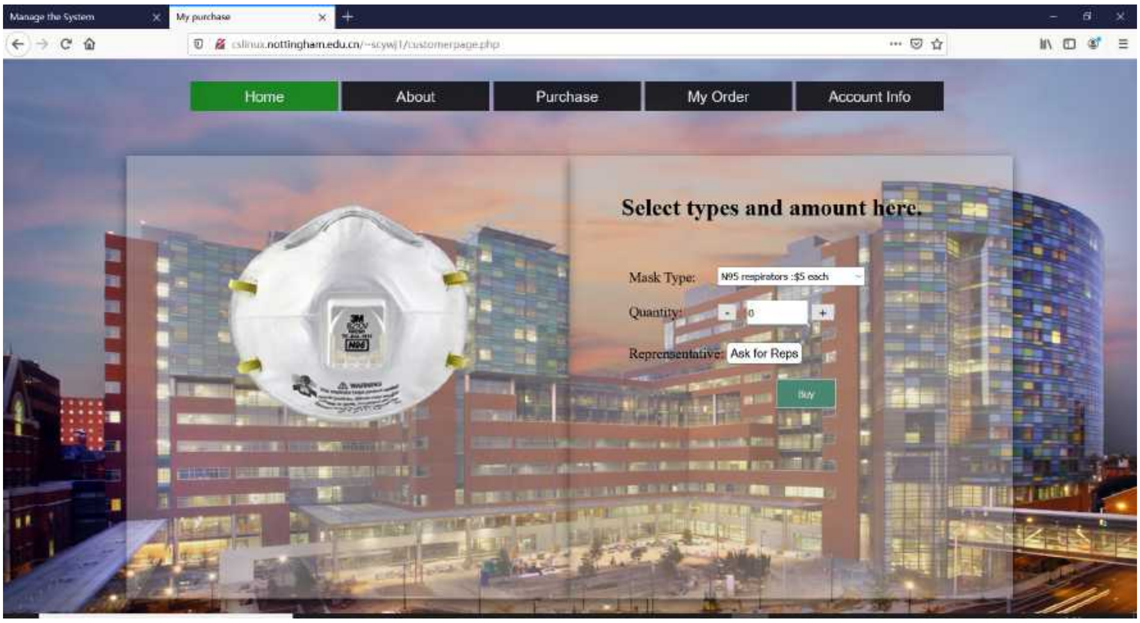


Figure 32: No representatives

In the above age, we can see that the place where a drop-down list for customers selecting representatives doesn't exist. Instead, a button takes up the place. In this situation, it is because there are zero representatives assigned to the region that is same to the customer's. If the customer wants a representative to deal with his/her purchase, the *Ask For Reps* button is expected to be pressed so that this request can be sent to manager for further assigning.

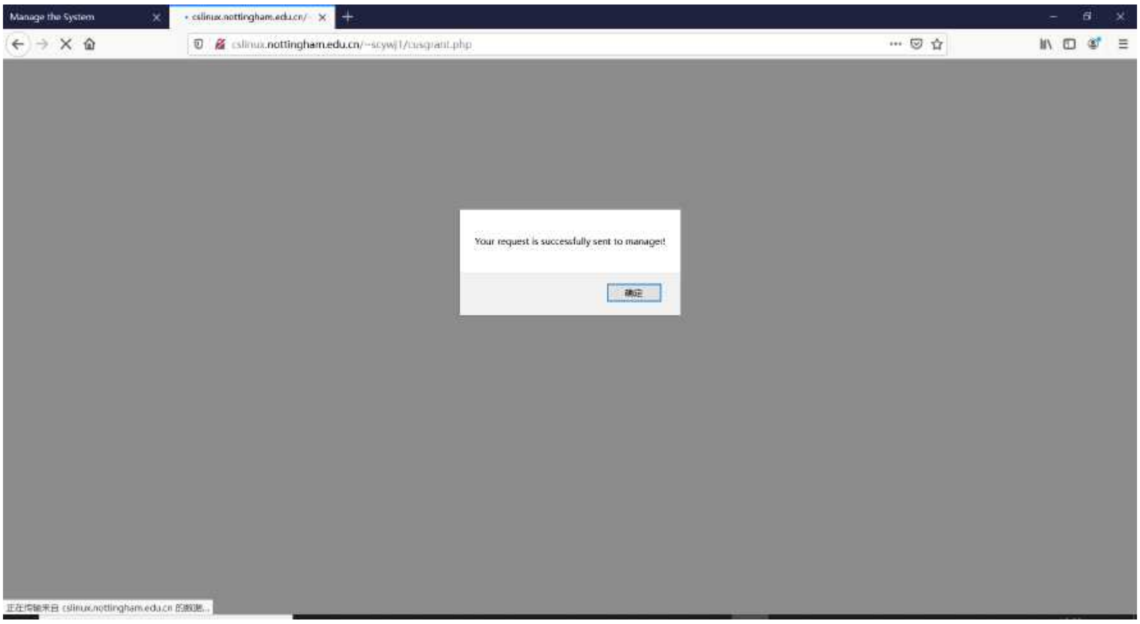


Figure 33: Functions in Mask Info

After clicking the button, the website will prompt a message showing that the request is successfully sent to manager.

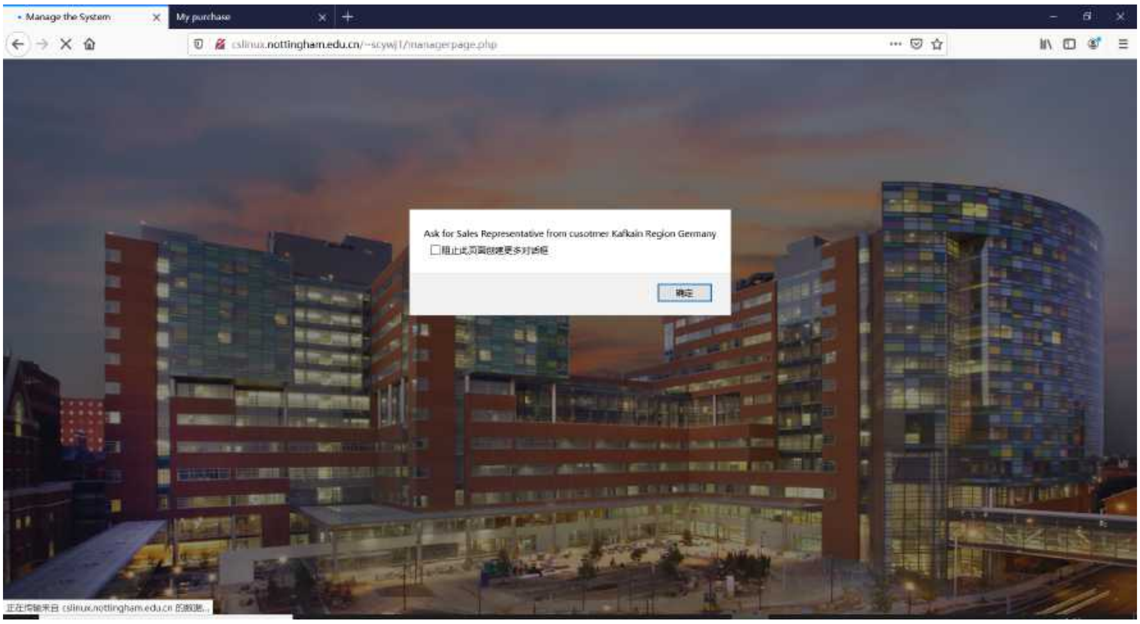


Figure 34: Functions in Mask Info

Next time when manager logs in the system, he/she will be notified of the request message so that they can assign a new representative to customer's region.

After assigning, the customer will see the list of representatives as usual.

Anomaly purchase by Customer

Figure 35: Anomaly Purchase

We can see from the picture that the quantity of this purchase is greater than the available quota of the selected representative. Therefore this purchase is considered as anomaly purchase.

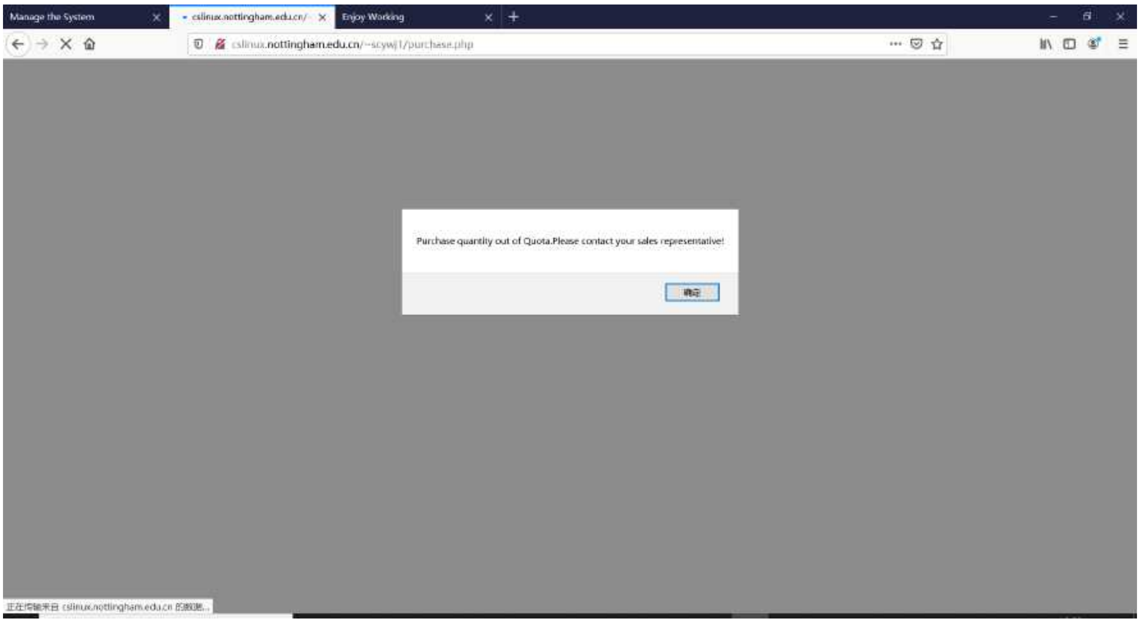


Figure 36: Anomaly Purchase

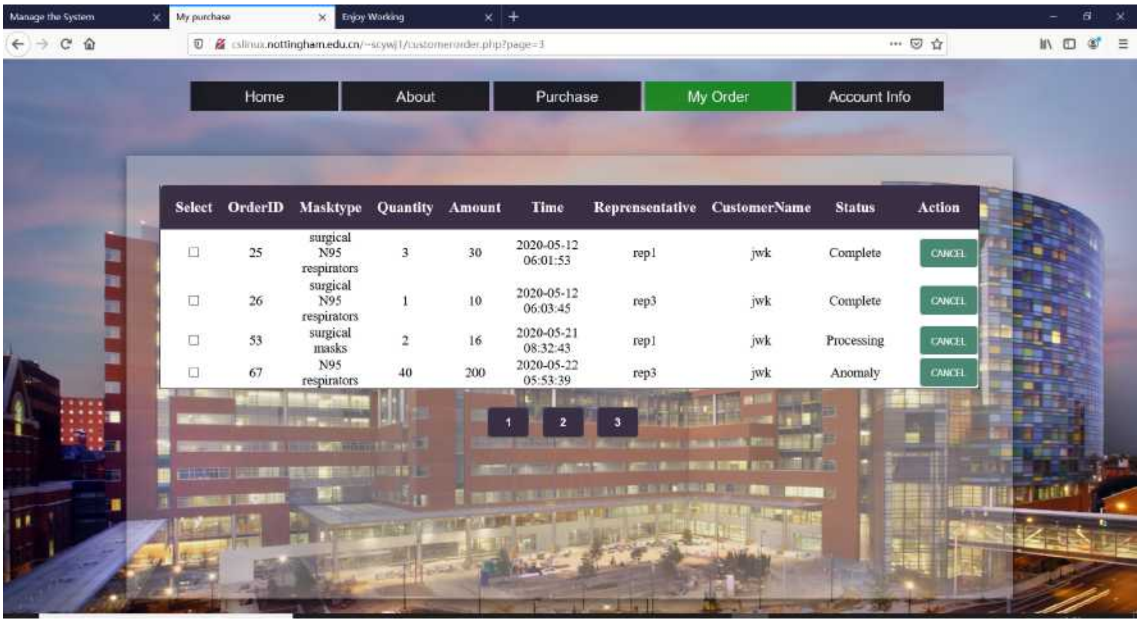


Figure 37: Anomaly Purchase

The customer will receive a warning message after clicking *buy* button if it is an anomaly purchase instead of a *"Purchase successfully"* message. Also in the total order page, the status of the order is anomaly. It is expected that customers contact their sales representatives once an anomaly purchase is generated also representatives are required to contact their customers who ordered anomaly orders immediately.

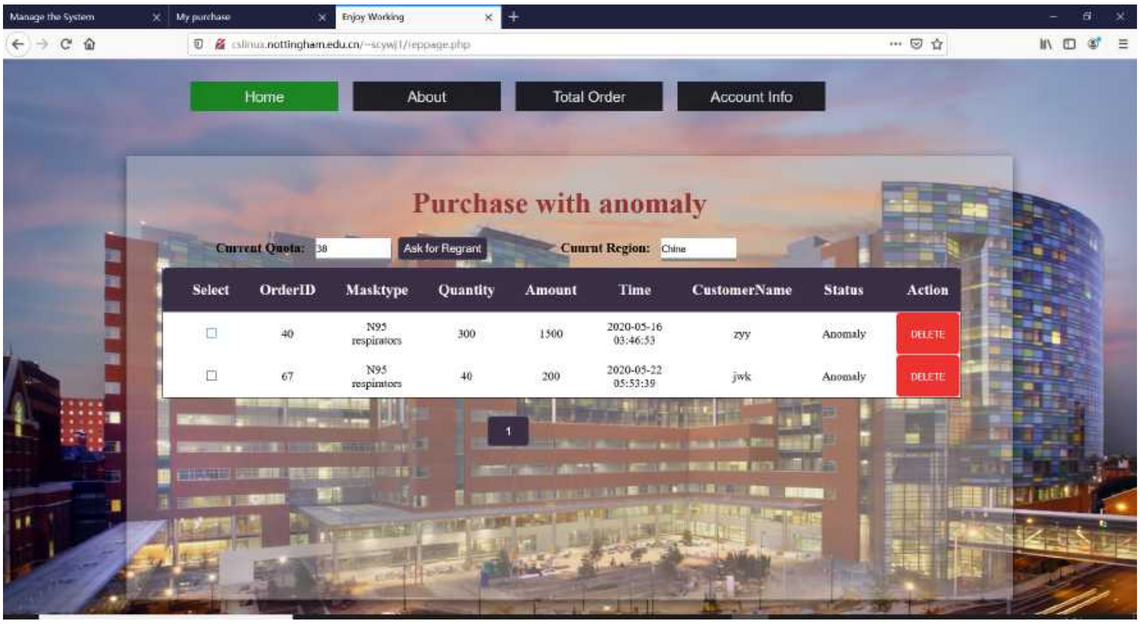


Figure 38: Anomaly Purchase

The above page shows what representatives will receive after customers order anomaly purchase. After contacting customers to clarify the situation and inform them that it is not allowed to purchase beyond representatives' quota,representative are supposed to delete these orders or manager will be notified of these anomaly orders.

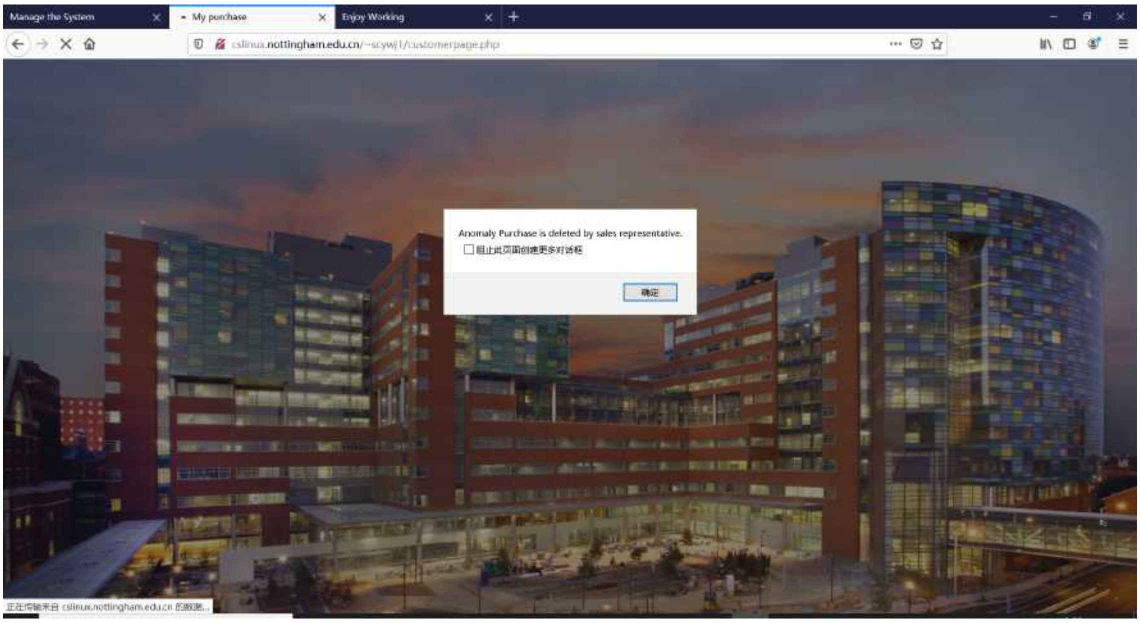


Figure 39: Anomaly Purchase

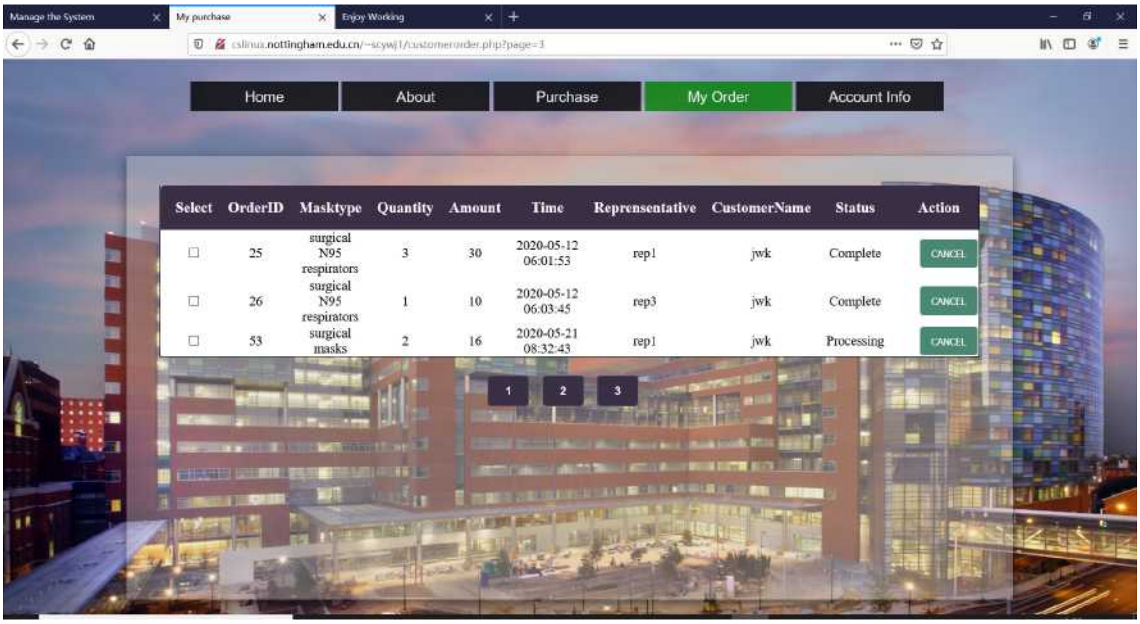


Figure 40: Anomaly Purchase

If the anomaly orders are successfully deleted by the reps, customers will receive a message once they log in. One example is showed in the above pictures. And we can see that the anomaly order is gone in the total order table.

Ask for More Quota From Representative

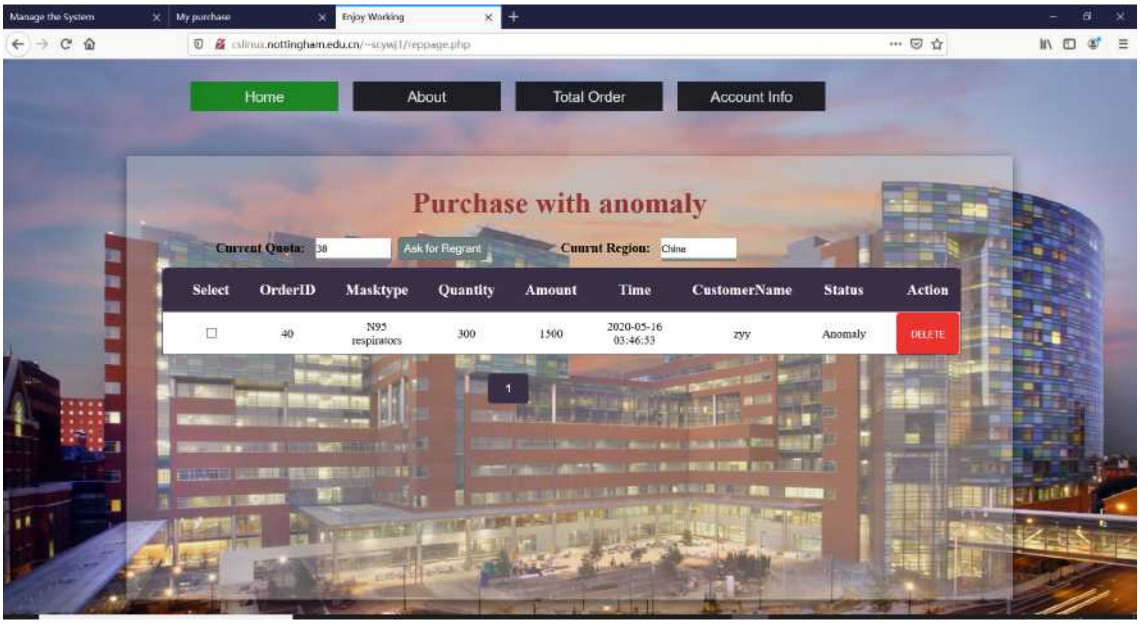


Figure 41: Quota Regrant

This section will introduce the interactive working mode between representatives and manager. Reps can ask manager to assign more quota by clicking the button.

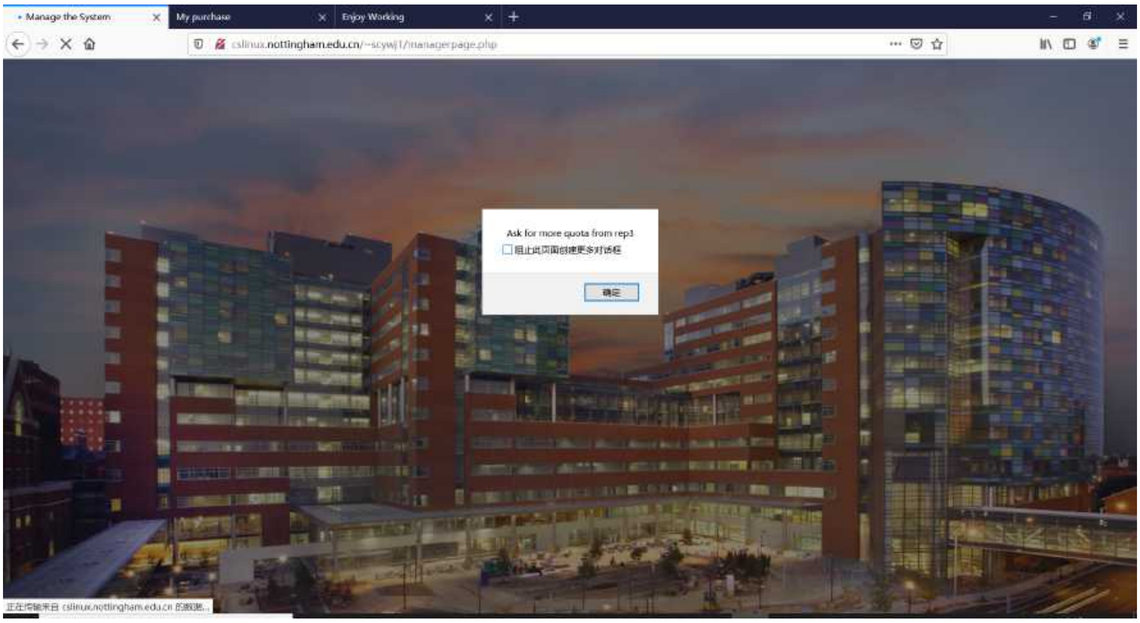


Figure 42: Quota Regrant

After the message is sent, manager will receive a message same as the above message.

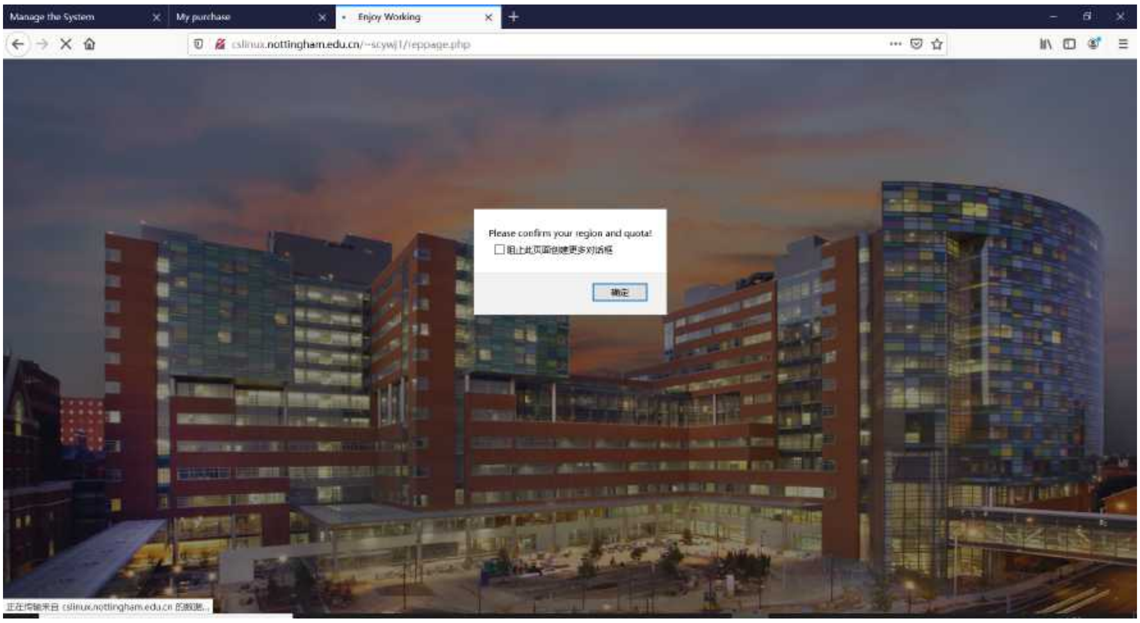


Figure 43: confirm quota and region

After assigning, reps will receive a message to confirm current quota and region. We can see from the window that the quota is already granted to 100.

4 Discussion

4.1 Why/How it works

This face mask management system is located in the cslinux server of University of Nottingham,Ningbo, China. Languages used in this system covers html,css,js,sql and php with both in-class knowledge and some additional tricks searched online.This system achieve all the basic requirements, details of different implementations will be showed in later sections with screenshots and demonstration.

4.2 Technical Details

All the technical skills implemented in this system are listed below.

- Javascript and PHP for form validation
- Using PHP to connect database and extract data
- Regular expression used in form validation
- JQuery to draw charts
- Pagination for every table

4.3 Limitations

Current system design is only built based on the requirements of coursework, there is still a huge gap between current work to real-world application. Features that could be developed in future work including but not limited to: payment system, privacy protection,mobile device page design etc.A better version of SMS could be developed in the future with more knowledge of this kind of e-commerce web system design.

5 External Library

In my system, I used a library called *charjs* for data visualization. It is an open source library under MIT license, user can freely use all the functions without purchasing any commercial licence. The github link of this library is https://github.com/chartjs/Chart.js and the link of documentation is https://charjs.org/docs/latest/. The brief working principle of this third party file is to use JQuery technique to read the data(encoded into json format) extracted from database by php and it allows user to set different chart patterns manually based on the extracted data. All the charts displayed in the Manager system use this library.