VIETNAM NATIONAL UNIVERSITY HO CHI MINH CITY

HO CHI MINH UNIVERSITY OF TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

REPORT SOFTWARE ENGINEER

HCMUT Smart Food Court System

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TP. HCM, 07/2020

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Change log

No	Date	Change	Actor
1	10/07/2020	Add Use case Diagram and 4.2	Huynh Thi Uyen
2	10/07/2020	Add 4.1 and Introduction	Vo Hoang Hai Nam
3	11/07/2020	Add Architecture Design	Vo Hoang Hai Nam
4	12/07/2020	Add 4.4	Tran Trong Nghia
5	12/07/2020	Add 4.3	Dang Ngoc Tam
6	12/07/2020	Add Implementation View, UI Preview, Conclusion	Huynh Thi Uyen

Work assignment

Huynh Thi Uyen	Payment feature, Conclusion, UI Preview
Vo Hoang Hai Nam	Introduction, Architecture, Order feature
Nguyen Hoang Nhat	Account Service feature
Dang Ngoc Tam	Manager feature
Tran Trong Nghia	Notify Order feature

I. INTRODUCTION

This is a system for students / professors of Ho Chi Minh University of Technology to order food at BK Food Court. Customers can choose food at home and pick up, reduce the overload for Food court during rush hours and help Food court to prepare and serve better.

The dishes are clearly classified, reducing the time to wonder when choosing. There is also a display of new items that make it easier for customers to access than traditional ways.

E-payment completely, do not use cash helps owner to reduce the cost of managing the system of salespeople, money management staff, ...
Data collected on database helps analyze customer behavior to increase revenue for the Food Court in future

II. FUNCTIONAL REQUIREMENTS

1. Main features

- Order: customers choose dishes and add to cart
- Payment: make an online payment
- Manage: vendor owners edit, add, remove, update dishes
- Notify Order: chef sends notification to customer when the order is completed
- Account Service: customers login to the system or have their accounts for more privileges

2. Use case Diagram

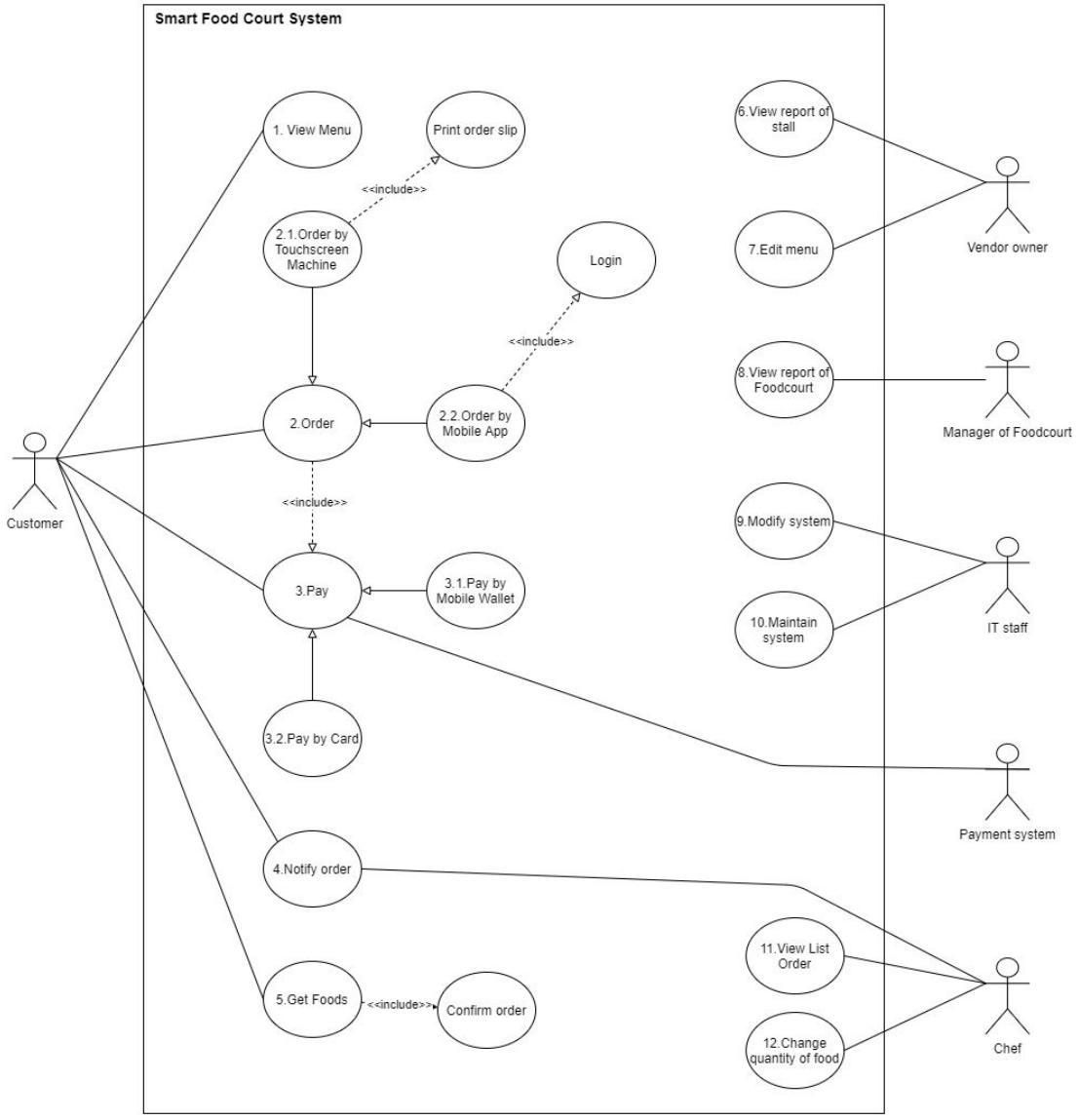


Figure I.1 Use case Diagram for Smart Food Court

3. Methods of implementation

- Platform: Website
- Front-end: HTML/CSS/JavaScript
- Back-end: C# ASP.NET base on Framework 4.8
- Database: NoSQL with Firebase

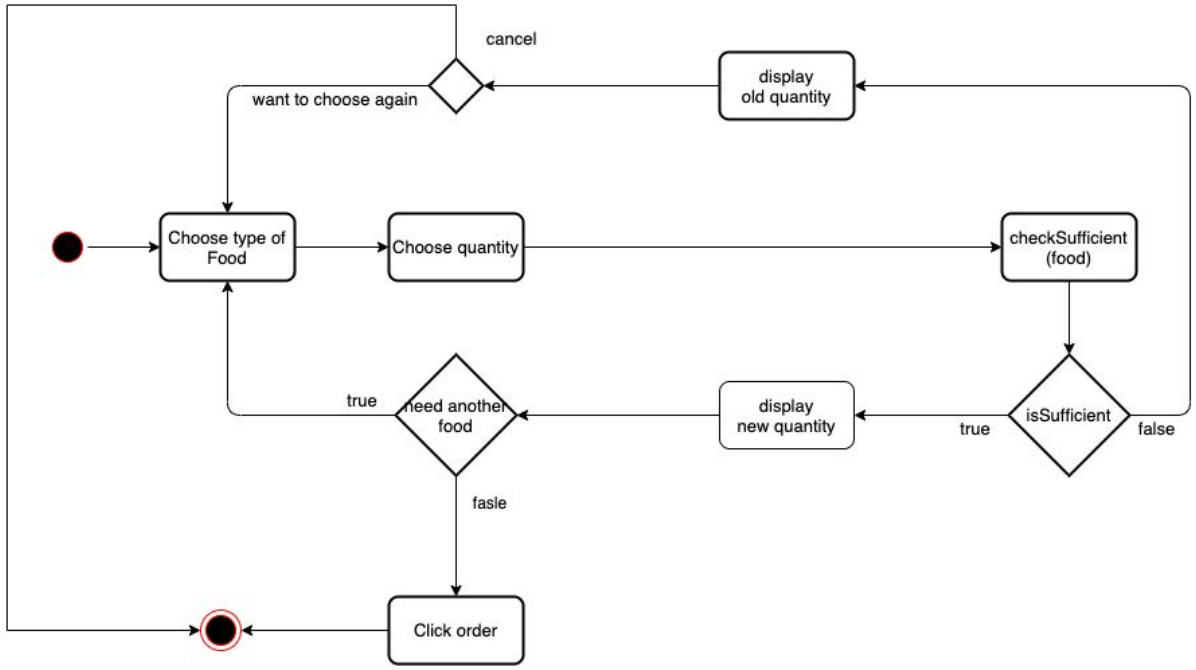
4. Feature Details

4.1 Order

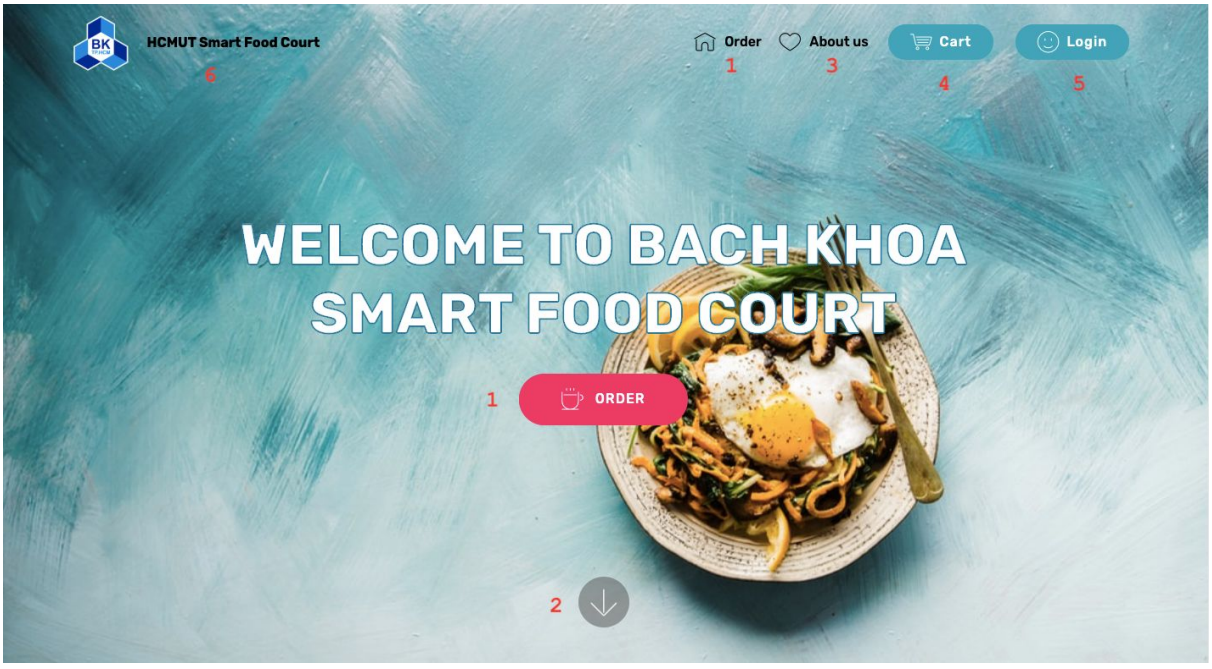
4.1.1 Use case Description

Use Case ID:	02
Use Case Name:	Order Foods
Created By: Hai Nam	**Last Updated By:** Hai Nam
Date Created: 20/4/2020	**Date Last Updated:** 10/7/2020
Actors:	Customer
Description:	Customer wants to order from foodcourt to get foods
Trigger:	Press order button on Touch screen machine or Mobile app
Preconditions:	1. Touch screen machines are available or Mobile app is installed and is logged in 2. Customer is in View menu mode
Postconditions:	1. Customer orders successfully 2. Orders are sent to suitable vendors
Normal flow:	1. Customer chooses type and quantity of food in stock 2. Customer clicks the order button 3. Customer click to Cart button to view all items chosen 4. Customer click Purchase
Alternative flow:	**Alternative 1** at step 3 6a: Customer choose more products
	Alternative 2 at step 4 4.a: Customer edit quantity of food they need
Exceptions flow:	**Exception 1** at step 1 1a. Customers choose the number of foods greater than the remaining number 1a1. The system will notify the number of remaining foods and return step 1 or customer cancels the order.

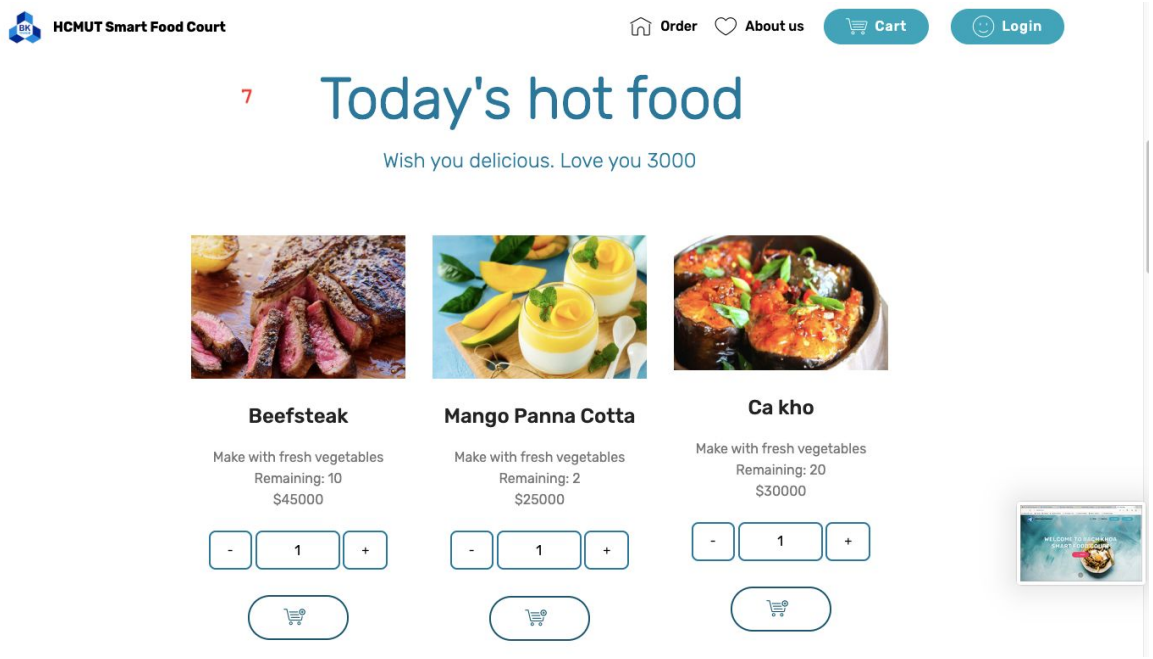
Main Flow



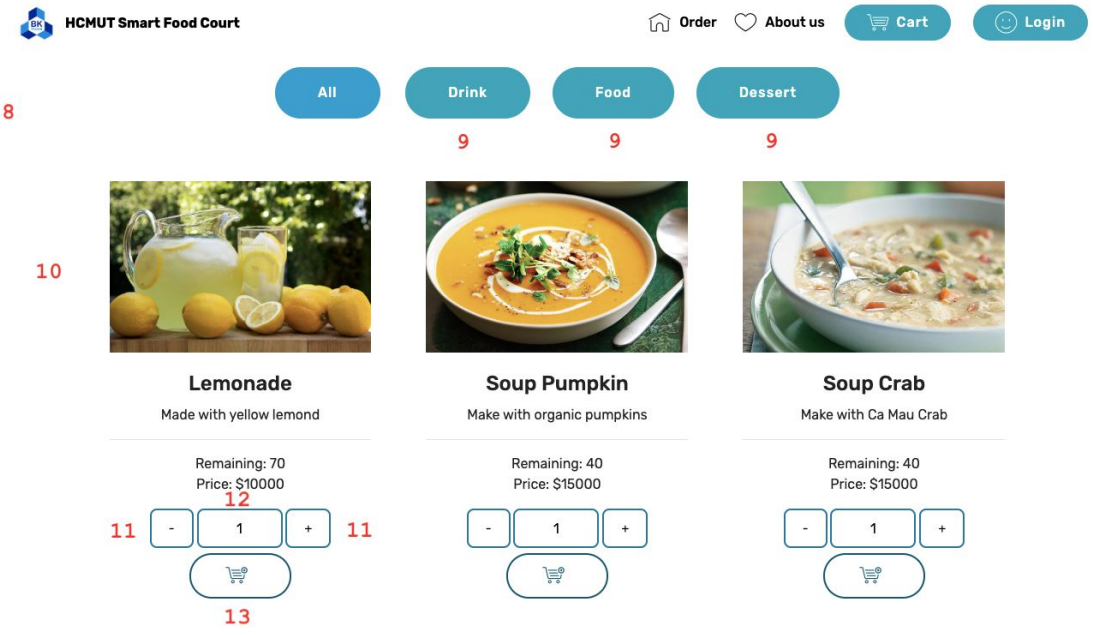
4.1.2 Mock-up



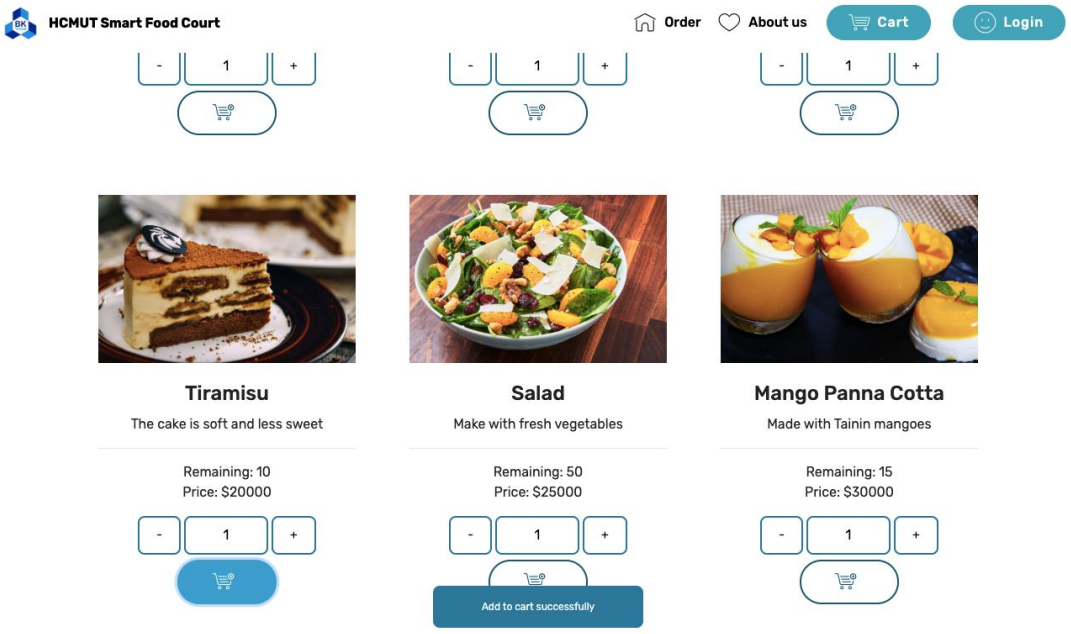
Homepage UI



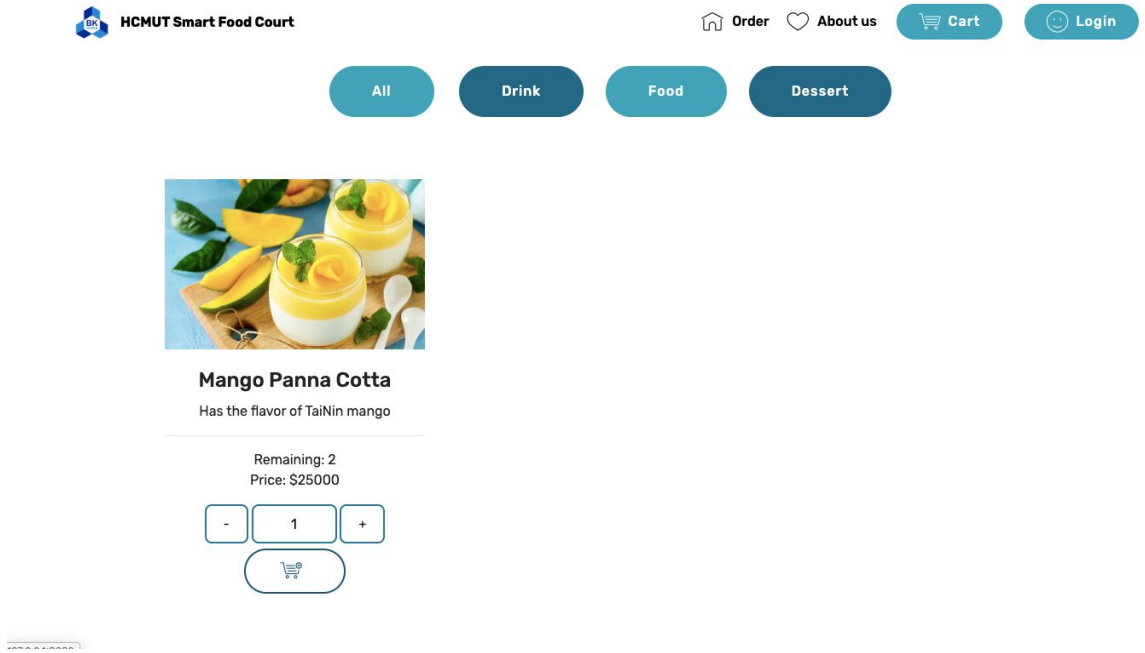
When click button Order or scrolling down, customer will see Today's hot food



When customers scroll down, they will see the Menu UI. Each food is in 1 box with pictures and information



If they click button with icon Cart, small snackbar will pop-up



When they click the button Drink/Food/Dessert/... Only food with this tag will display

4.1.3 Description

No	Field Name	Description	Control Type	Data Type	Mandatory	Default Value
1	Order	Redirect to “Today’s hot food” section	Button	N/A	Yes	N/A
2	Down arrow	Redirect to “Today’s hot food” section	Button	N/A	Yes	N/A
3	About us	Redirect to “About us” page	Button	N/A	Yes	N/A
4	Cart	Redirect to “Cart” page	Button	N/A	Yes	N/A
5	Login	Redirect to “Login” page	Button	N/A	Yes	N/A
6	Label	Redirect to Home page	Label	Text	Yes	N/A
7	Hot food section	Display food assigned with “hot” tag	Display	Image Text	Yes	N/A
8	Menu section	Display all food serviced by Food court	Display	Image Text	Yes	N/A
9	Classification button	Select the label to filter food	Button	N/A	Yes	N/A
10	Food information	Display information of food (Image, description, remaining quantity, price)	Display	Image Text	Yes	N/A
11	Numeric button	Adjust the number of foods	Button	N/A	Yes	N/A
12	Quantity box	Display number of food chosen	Text input	Text	Yes	N/A
13	Add cart	Add food chosen to cart	Button	N/A	Yes	N/A

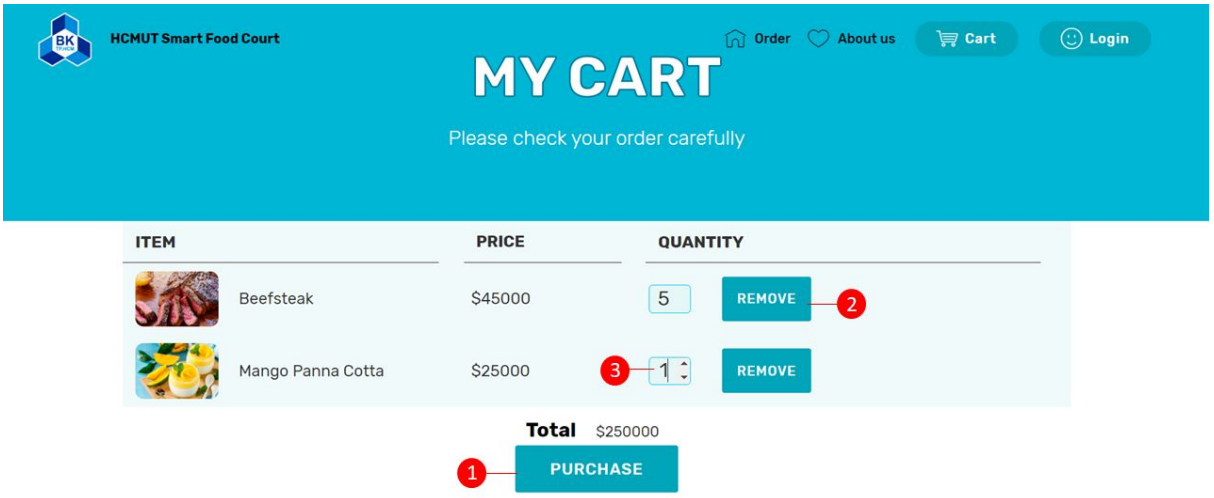
4.2 Online Payment

4.2.1 Use case Description

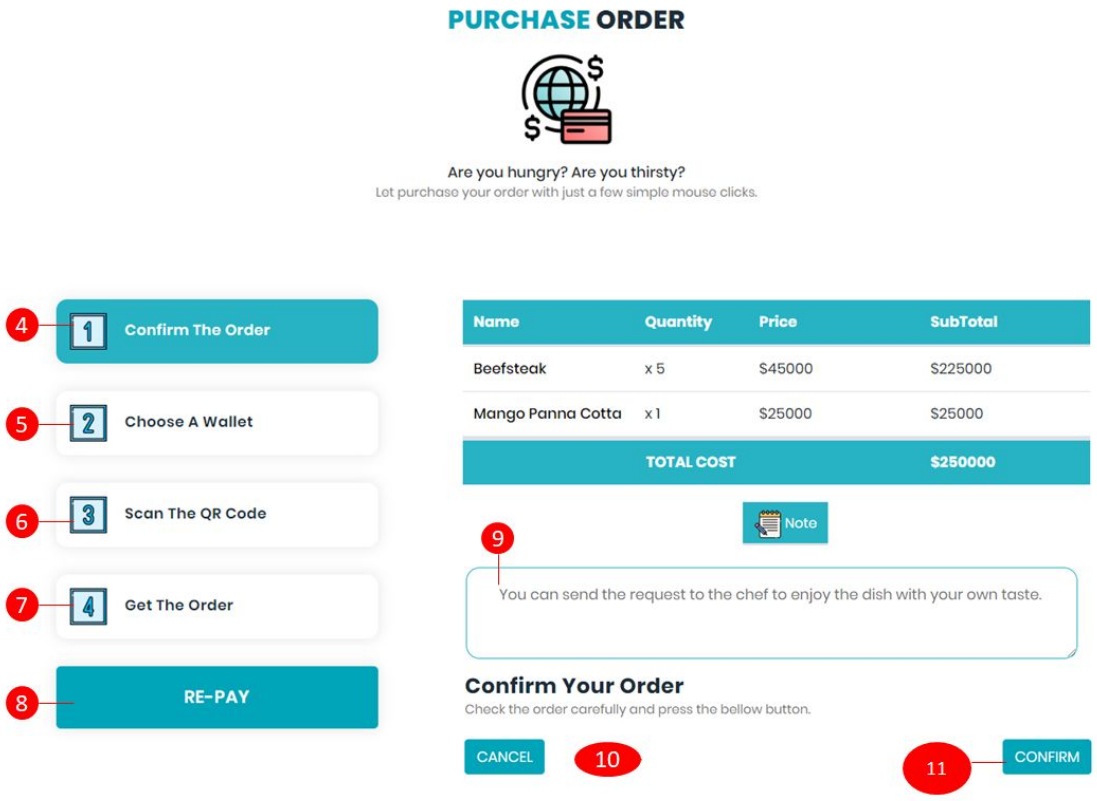
Use Case ID	3.1		
Use Case Name	Pay the order by mobile wallet		
Created By	Huynh Thi Uyen	Last Updated By:	Huynh Thi Uyen
Date Created	22/04/2020	Date Last Updated:	02/05/2020
Actor	Customer, payment service		
Description	Customer makes a payment for food ordering.		
Trigger	Customer pays the order.		
Preconditions	- Customer orders food. - Customer has at least an online payment service account.		
Postconditions	The ordering is confirmed.		
Normal Flow	1. Customer presses the button “Pay” on the screen. 2. The system displays bills with total cost on the screen. 3. Customer verifies payment for the bill. 4. Customer selects “Online payment” method. 5. The system presents a payment code and a QR code on the screen. 6. Customer logins into the “Pay the bill” feature on the Online payment service (Momo wallet, Zalo Pay, etc.) 7. Customer enters the given payment code. 8. The online payment service verifies code, presents the money need paid. 9. Customer accepts the payment. 10. The online payment service makes a transaction with the customer’s account. 11. The payment service notifies to the system and customer that payment is successful.		

Exceptions	**Exception 1**: at step 2 2a. If the bill is wrong, customer makes payment again or cancels. **Exception 2**: at step 8 8a. Customer enters incorrect code, the payment service requires the customer to enter again at most 3 times. At the 3rd, cancels payment. 8b. The bill is wrong, customer tries to enter code or cancels **Exception 3:** at step 9 9a. Customer doesn't accept, cancels they payment. **Exception 4:** at step 11 11a If the transaction fails and the online payment service doesn't send "successful payment" notification in 10 minutes, the system will cancel the bill.
Alternative Flows	**Alternative 1:** at step 7 7a. Customer scans QR code Continue step 8

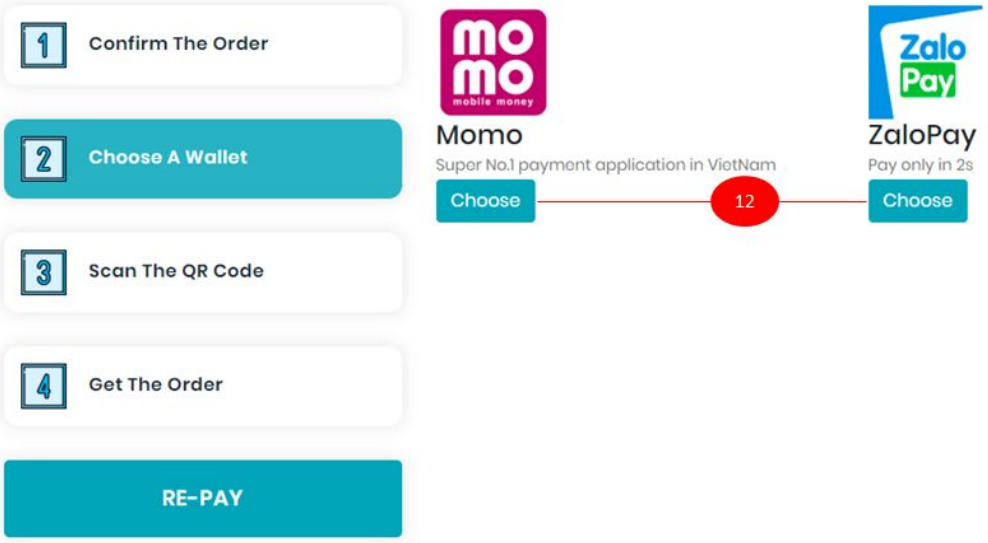
4.2.2 Mock-up



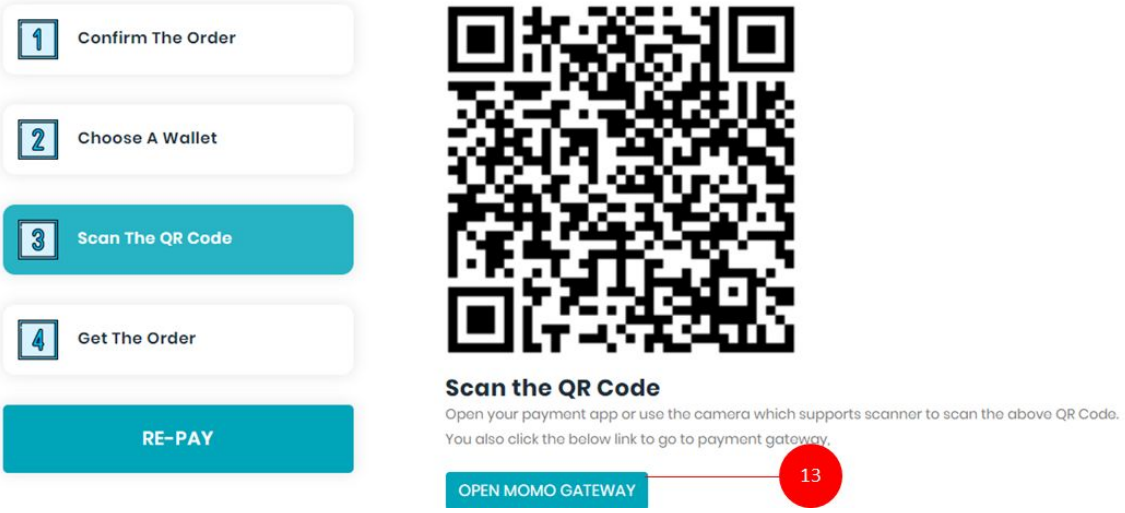
View Cart



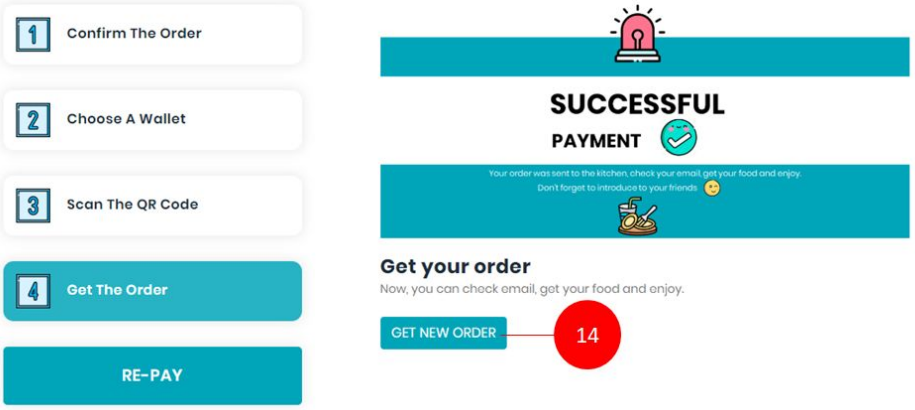
Purchase Page after clicking purchase button in cart view



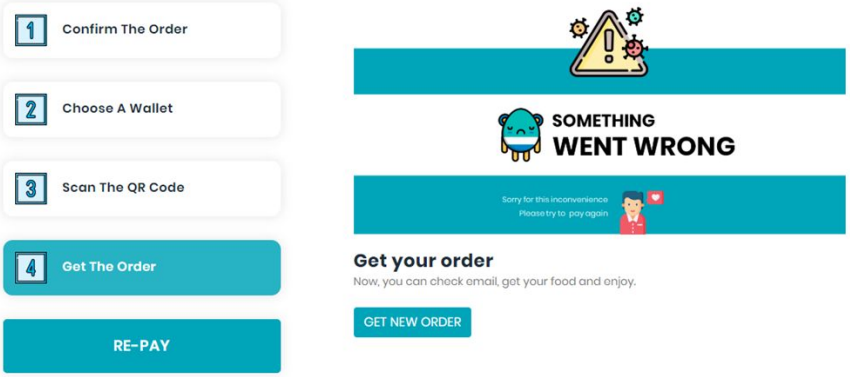
Choose Online Wallet



Display QR Code and link to payment gateway after choosing wallet



Successful Payment



Failed Payment

4.2.3 Description

No	Field Name	Description	Control Type	Data Type	Mandatory	Default Value
1	Purchase	Redirect to payment page	Button	N/A	Yes	N/A
2	Remove	Remove a dish from the order	Button	N/A	Yes	N/A
3	Quantity Change	Change quantity of a dish	Text Input	Number	Yes	N/A
4	Step 1	Confirm the order	Button	N/A	Yes	N/A
5	Step 2	Choose Online Wallet	Button	N/A	Yes	N/A
6	Step 3	Display the QR Code with corresponding online wallet and button link to payment gateway	Button	N/A	Yes	N/A
7	Step 4	Notify customer about payment result and get the order	Button	N/A	Yes	N/A
8	Pay again	Backward to step 1 for making a payment from the beginning	Button	N/A	Yes	N/A
9	Food Note	Enter the additional request for food	Text Input	Text	Yes	Empty String
10	Cancel	The order is wrong, redirect to cart view	Button	N/A	Yes	N/A
11	Confirm	The order is confirmed and forwarded to step 2	Button	N/A	Yes	N/A
12	Choose	The online wallet is chosen, process for making a request to online wallet server	Button	N/A	Yes	N/A
13	Open Wallet Gateway	Link to payment gateway page	Button	N/A	Yes	N/A
14	Get new order	Redirect to order page to get the new one	Button	N/A	Yes	N/A

4.3 Manage

4.3.1 Use case Description

Name of use case	Edit menu
ID of use case	07
Created by	Ngoc Tam
Date created	29/4/2020
Actors	Vendor owner
Preconditions	Vendor owner is identified and authenticated
Postconditions	New menu is saved and displayed in touchscreen and application
Trigger	Vendor owner wants to edit menu
Main flows	1. Vendor owner selects “Add menu” item on the screen.. 2. A table is displayed with some information about food/drink. 3. Vendor owner fills all information in the table. 4. Vendor owner selects “Ok” button. 5. System processes request, then a dialog is displayed on the screen to notify the action completing.

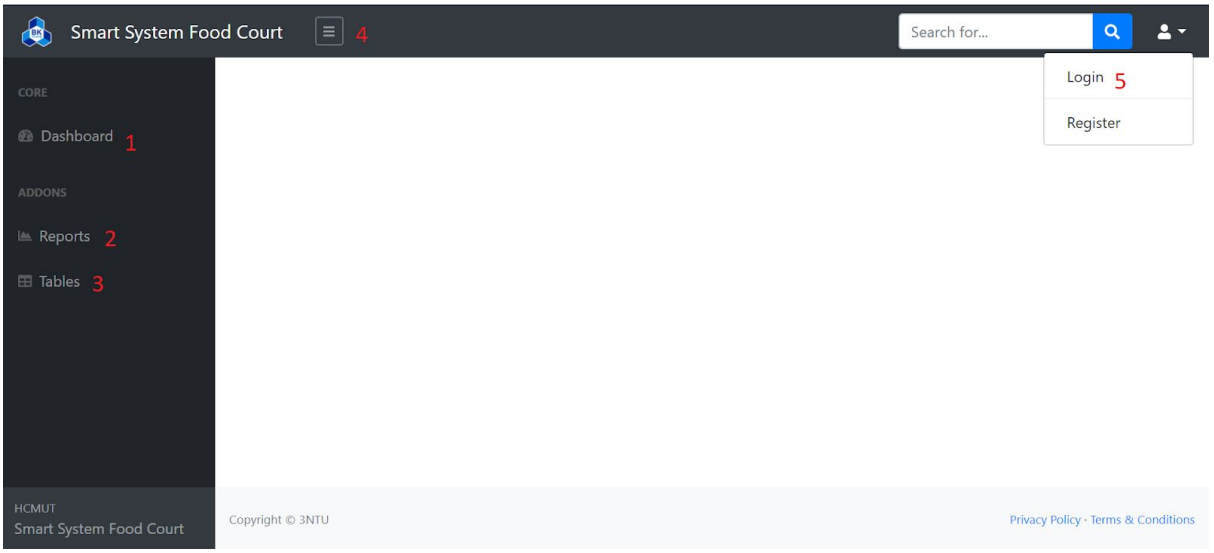
Alternative flows	1a. Vendor owner wants to remove food/drink 1. Vendor owner selects “Remove button” in the item which he/she wants to remove 2. The dialog is displayed, vendor owner selects “Yes” button. 3. Step 5 in the main flow 1b. Vendor owner wants to update food/drink 1. Vendor owner selects “Update button” in the item which he/she wants to remove 2. Start from step 2 in main flow.
Exceptions	*a. At any time, , vendor owner doesn’t want to edit the menu, he/she can select “X” button at the top-right corner to cancel. 4a. Vendor owner doesn’t complete information in the table. 1. System requests missing information. 2. Vendor owner supplies missing information. 6a. System fails to process requests. 3. A dialog with the message “Action failed” is displayed. 4. Vendor owner selects “Ok” button and goes back to step 1.
Non-functional Requirements	System responds to all actions of the vendor owner within 1s. The percentage of the system that fails is less than 2%. Vendor owners have to fill the table within 10 minutes.

View report

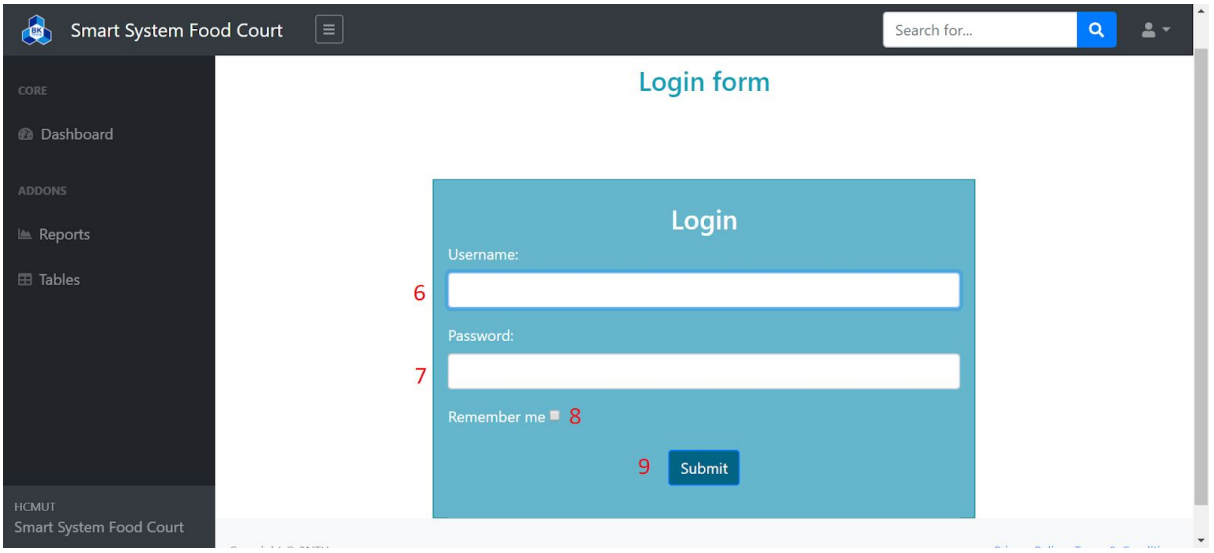
Use Case ID:	06
Use Case Name:	View report of Food court
Created By: Hai Nam	**Last Updated By:** Hai Nam
Date Created: 22/4/2020	**Date Last Updated:** 10/07/2020
Actors:	Manager of Food court
Description:	Manager wants to view the online report of whole Food court
Trigger:	Manager request to see the report
Preconditions:	1. Manager has had manager account yet
	2. Manager device connected Internet
Postconditions:	1. Manager views the online report successfully
	2. Manager can download report as needed
Normal flow:	1. Manager loggins to system
	2. Manager clicks “Get Report” button
	3. System presents two date boxes with choice of date begin and latest date to show report
	4. Manager types start date and latest date in two boxes
	5. Manager clicks Get report button
	6. The system displays the report of whole Food court
	7. Manager view the report online
Alternative flow:	**Alternative 1** at step 4
	4a: Manager selects available options such as 1 nearest month and 2 nearest months.
Exceptions flow:	**Exception 1** at step 4
	4b: Manage enter the wrong date format, pre-establishment time, or future time input
	4b1: Display message "Wrong day" and come back to step 3

4.3.2 Mock-up

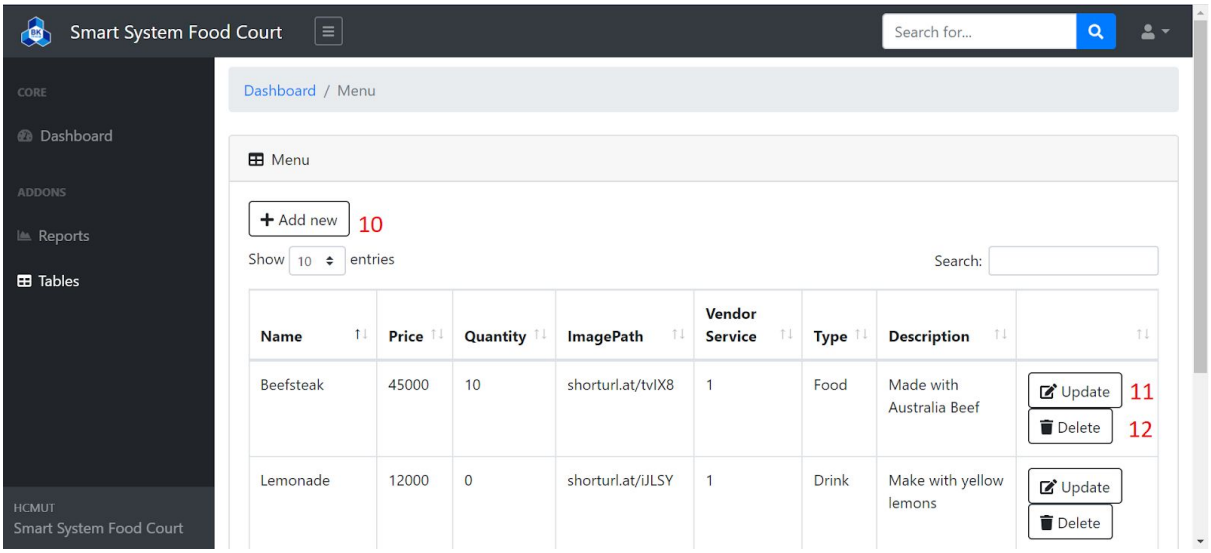
Main UI

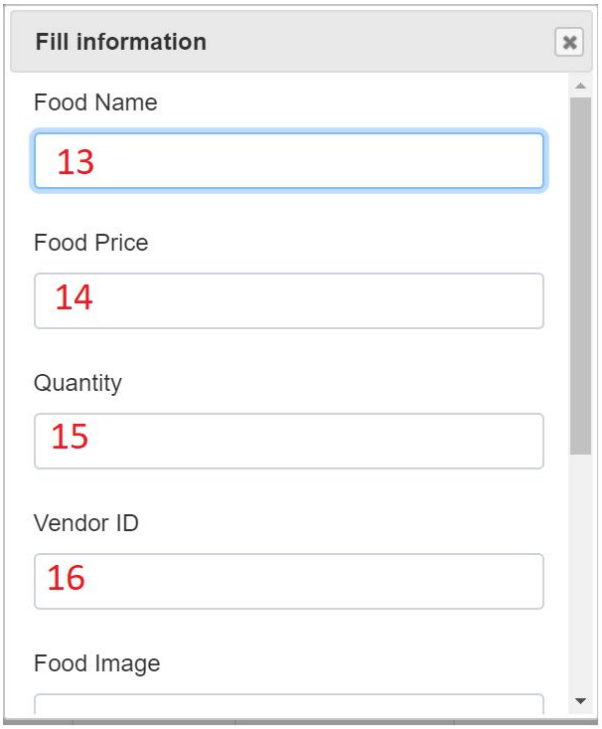


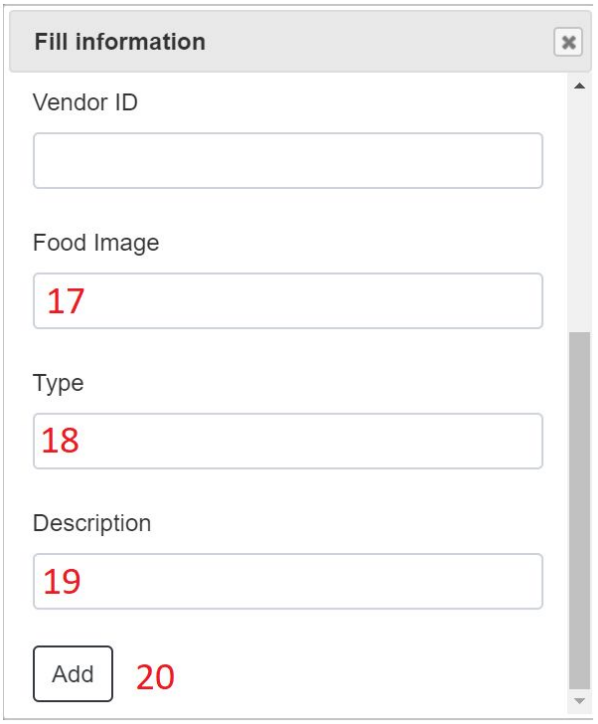
Login



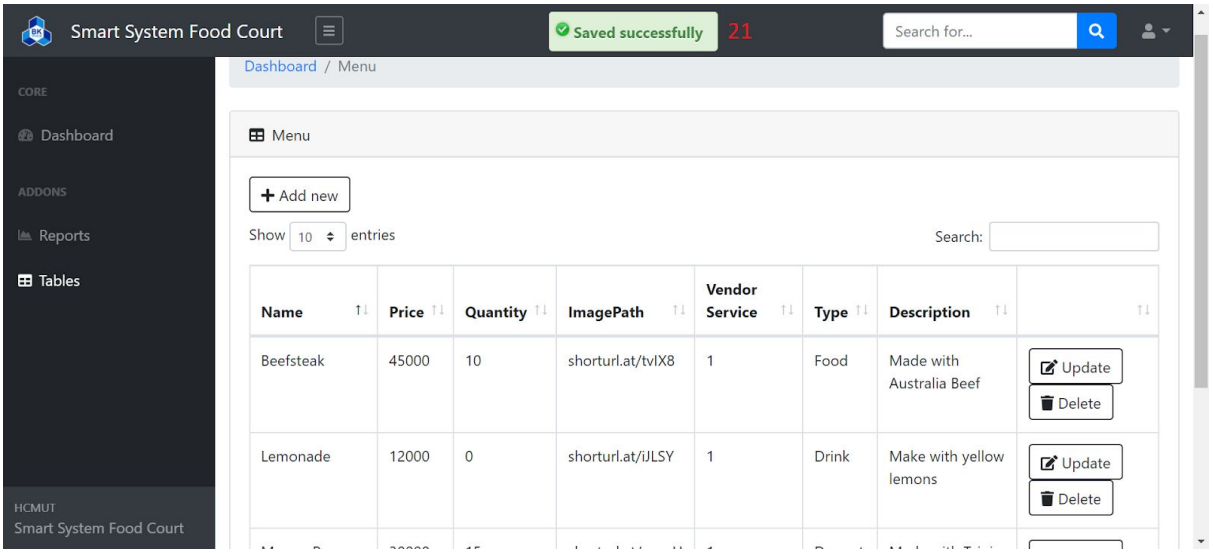
Operation

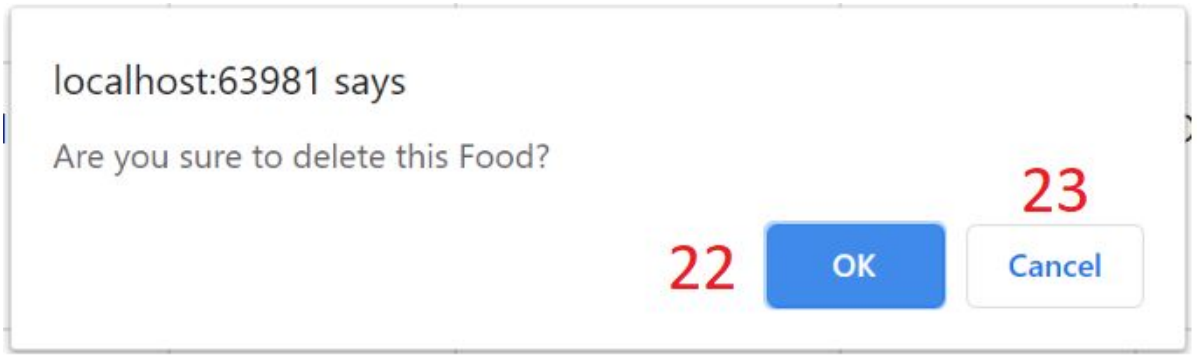

Smart System Food Court
Search for...
CORE
Dashboard
ADDONS
Reports
Tables
HCMUT
Smart System Food Court
Dashboard / Menu
Menu
+ Add new
10
Show 10 entries
Search:
Name
Price
Quantity
ImagePath
Vendor Service
Type
Description
Beefsteak
45000
10
shorturl.at/tvlX8
1
Food
Made with Australia Beef
Update
11
Delete
12
Lemonade
12000
0
shorturl.at/iJLSY
1
Drink
Make with yellow lemons
Update
Delete

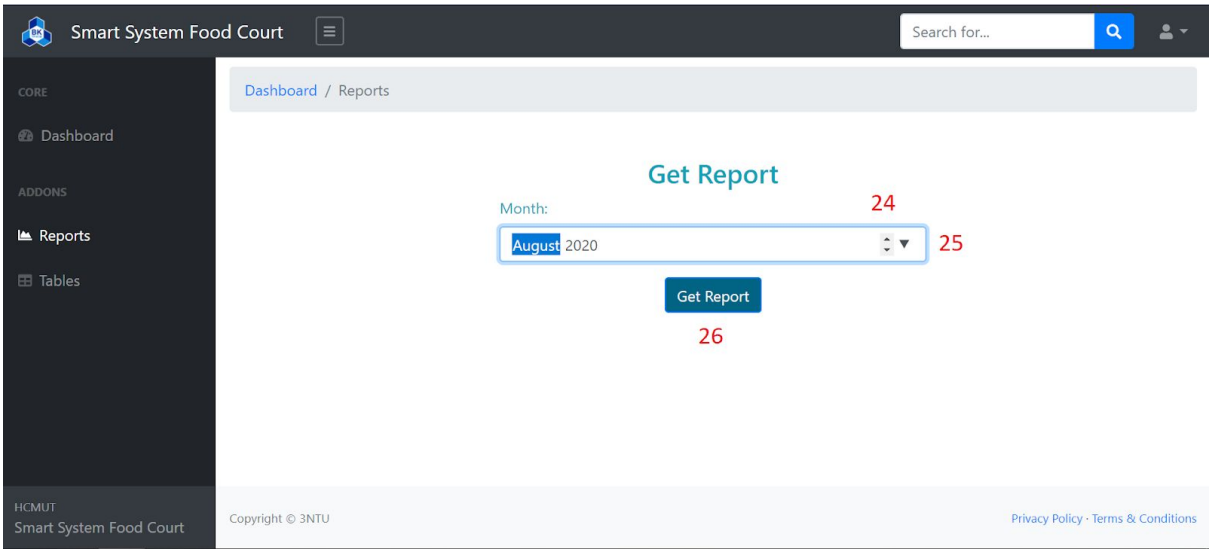

Fill information
Food Name
13
Food Price
14
Quantity
15
Vendor ID
16
Food Image


Fill information
Vendor ID
Food Image
17
Type
18
Description
19
Add
20

Message


Smart System Food Court
Saved successfully
21
Search for...
Dashboard / Menu
CORE
Dashboard
ADDONS
Reports
Tables
Menu
+ Add new
Show 10 entries
Search:
Name
Price
Quantity
ImagePath
Vendor Service
Type
Description
Beefsteak
45000
10
shorturl.at/tvIX8
1
Food
Made with Australia Beef
Update
Delete
Lemonade
12000
0
shorturl.at/iJLSY
1
Drink
Make with yellow lemons
Update
Delete
HCMUT
Smart System Food Court


localhost:63981 says
Are you sure to delete this Food?
22
OK
23
Cancel


Smart System Food Court
Search for...
Dashboard / Reports
CORE
Dashboard
ADDONS
Reports
Tables
Get Report
Month:
24
August 2020
25
Get Report
26
HCMUT
Smart System Food Court
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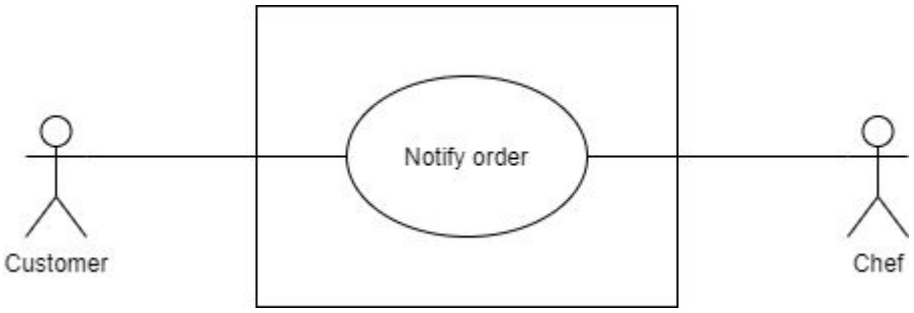
4.3.3 Description

No	Field Name	Description	Control Type	Data Type	Mandatory	Default Value
1	Dashboard	Redirect to manager home page	Link	N/A	Yes	N/A
2	Reports	Redirect to report page	Link	N/A	Yes	N/A
3	Tables	Redirect to menu page	Link	N/A	Yes	N/A
4	Bars Icon	Open and close sidebar	Button	N/A	Yes	N/A
5	Login	Redirect to login page	Link	N/A	Yes	N/A
6	username	Type username	Text Input	N/A	Yes	Empty String
7	password	Type password	Text Input	N/A	Yes	Empty String
8	remember-me	Remember the account for next time	Check Box	N/A	Yes	False
9	submit	Submit login form to sever	Button	N/A	Yes	N/A
10	Add new	Open pop-up form and wait for user fill information to add new food	Button	N/A	Yes	N/A
11	Update	Open pop-up form and wait for user fill information to update food	Button	N/A	Yes	N/A
12	Delete	Delete food	Button	N/A	Yes	N/A
13	Food Name	Vendor owner type name of food	Text Input	N/A	Yes	N/A
14	Food Price	Vendor owner type price of food	Text Input	N/A	Yes	N/A

15	Quantity	Vendor owner type initial quantity of food	Text Input	N/A	Yes	Empty String
16	Vendor ID	Vendor owner type vendor id which server this food	Text Input	N/A	Yes	N/A
17	Food Image	Vendor owner type image source of food	Text Input	N/A	Yes	N/A
18	Type	Vendor owner fill type of food	Text input	Text	Yes	Empty String
19	Description	Vendor owner type detail description of food	Text input	Text	Yes	Empty String
20	Add	Submit form to server	Button	N/A	Yes	N/A
21	Message	Message is displayed after vendor owner complete a operation	Text Message	N/A	Yes	N/A
22	Ok	Confirm delete food	Button	N/A	Yes	N/A
23	Cancel	Vendor owner doesn't want to delete food	Button	N/A	Yes	N/A
24	Arrow	Increase or decrease month and year	Button	N/A	Yes	N/A
25	Arrow	Open calendar	Button	N/A	Yes	N/A
26	Get report	Get report of month is selected	Button	N/A	Yes	N/A

4.4 Notify Order

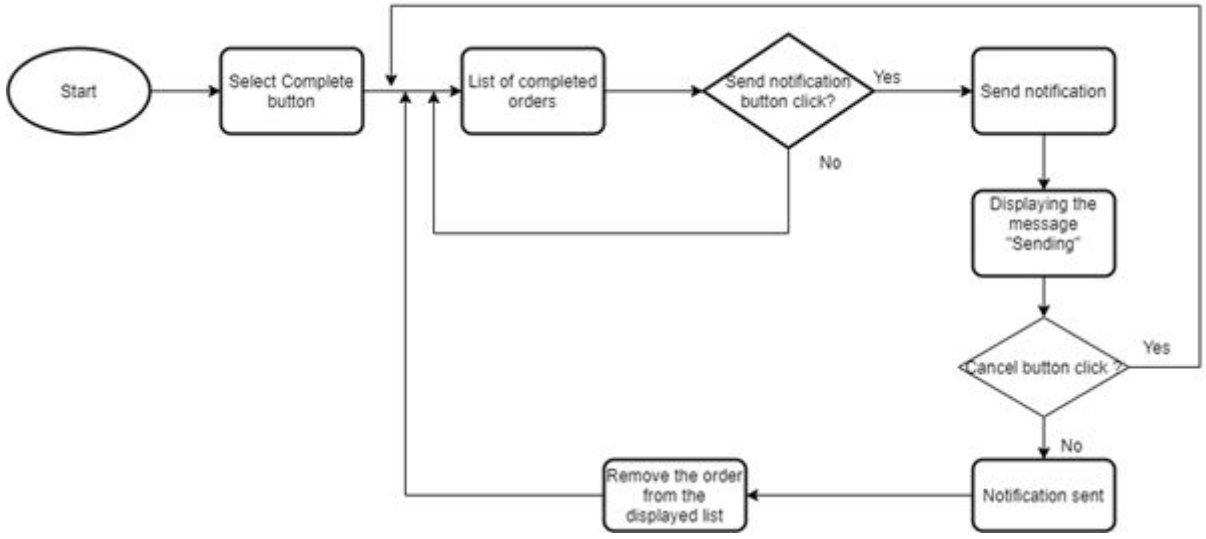
4.4.1 Use case Description



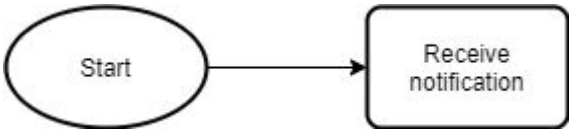
Use Case ID:	4		
Use Case Name:	Notify Order		
Actors	Chef, Customer		
Created By:	Tran Trong Nghia	**Last Updated By:**	Tran Trong Nghia
Date Created:	23 April 2020	**Date Latest Updated:**	01 May 2020
Description:	As a chef, I want to send notice of orders to customers		
Trigger:	Chef wants to send notice to the customer.		
Preconditions:	1. The customer has ordered and has paid the bill. 2. The food is ready. 3. The application on the customer phone must be connected to the network. If the customer uses a pager, the customer must not go out of range of receiving a pager signal. 4. The chef is viewing the list of orders.		
Postconditions:	1. The chefs send notice of orders to customers successfully. 2. The customer receives notification from chef.		
Normal Flow:	1. The chef selects orders to send notice 2. The chef presses the button to send a notice of completion of the food preparation to the customer 3. The system sends notification to the ordered account and the screen displays the message "Sending notice to customers". 4. The customer receives a notification from the chef and the chef's screen displays the message "Notification sent."		
Alternative Flow:	**Alternative 1:** at step 3		

	3a. If the order does not have the account name of the customer ordered, the system sends the order number to the pager machine. 3a1. The pager machine sends a signal to the device whose code matches the order number that needs to be notified. The use case continues step 4 in the normal flow.
Exceptions:	**Exception 1:** at step 3 3b. On the message "Sending notice to the customer", the chef press the "Cancel" button, the use case stops.

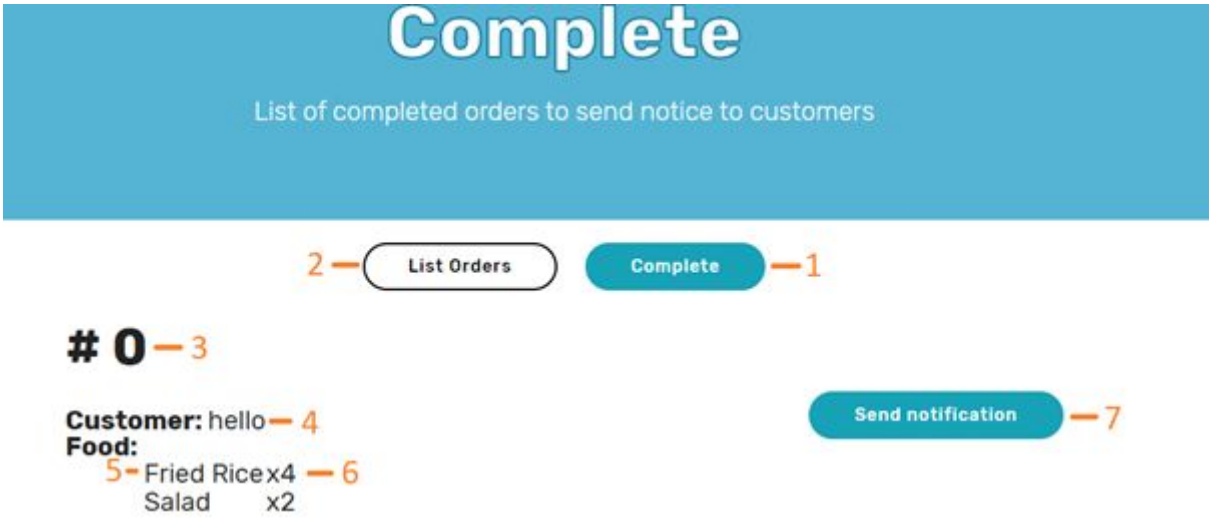
Chef main flow:



Customer main flow:



4.4.2 Mock-up



List of completed orders UI

Popup of sending notification

4.4.3 Description

No.	Field Name	Description	Control Type	Data Type	Mandatory	Default Value
1	Complete button	Display the list of completed orders	Button	N/A	Yes	N/A
2	List Orders button	Display the list of orders to be processed	Button	N/A	Yes	N/A
3	Order ID	Order Number	Label	Text	Yes	N/A
4	Customer name	Name of customer	Label	Text	Yes	N/A

5	Food name	Name of Food	Label	Text	Yes	N/A
6	Food quantity	Number of dishes ordered	Label	Text	Yes	N/A
7	Send Notification button	Send notification of completed orders to customers	Button	N/A	Yes	N/A
8	Cancel button	Cancel sending notice	Button	N/A	Yes	N/A

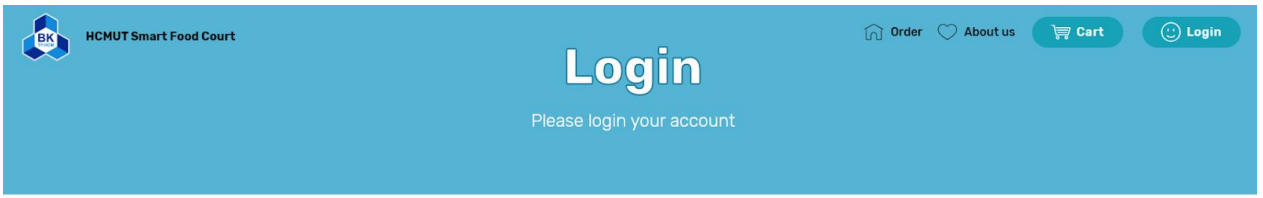
4.5 Account Service (Login & Signup)

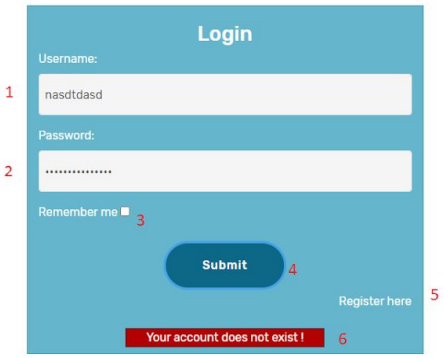
4.5.1 Use case Description

Use Case ID	5.1		
Use Case Name	Login Customer Account		
Created By	Nguyen Hoang Nhat	Last Updated By:	Nguyen Hoang Nhat
Date Created	2/5/2020	Date Last Updated:	04/05/2020
Actor	Customer, Account service.		
Description	Customer logs in with a registered account.		
Trigger	Customer wants to log in with a registered account.		
Preconditions	- Customer has loaded the website. - customer already has an account.		
Postconditions	Customer's account is logged.		
Normal Flow	1. Customer presses the button “Login” on the screen. 2. The system displays login form on the screen. 3. Customer fills in the login form with 2 fields: username and password to login. 4. Customer presses “Submit” button. 5. The system will return to the homepage for customer to continue.		
Exceptions	**Exception 1**: at step 5 5a. If the password field or username fields is empty, notify the customer to fill in. 5b. If the password or username is shorter than 8, notify the customer to retype. 5c. If the password or username have special characters, notify the customer to delete them. 5d. If the username is correct but the password is incorrect, notify the customer the wrong password.		

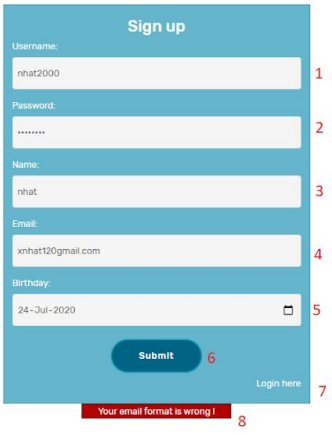
Use Case ID	5.2		
Use Case Name	Register Customer Account		
Created By	Nguyen Hoang Nhat	Last Updated By:	Nguyen Hoang Nhat
Date Created	3/5/2020	Date Last Updated:	06/05/2020
Actor	Customer, Account service		
Description	Customer registers a new account.		
Trigger	Customer wants to register a new account.		
Preconditions	Customer has loaded the website.		
Postconditions	New account has been registered. Database update new account data.		
Normal Flow	1. Customer presses the text “Register here” on the Login page. 2. The system displays the registration form on the screen. 3. Customer fills in the registration form with 5 fields: username, password, name, email, birthday to register. 4. Customer presses “Submit” button. 5. The system notifies success. After that, the system will return to the login page for the customer to continue.		
Exceptions	**Exception 1**: at step 5 5a. If the form has one or more fields that are empty, the system notify the customer to fill in. 5b. If the password or username is shorter than 8, notify the customer to retype. 5c. If the password or username have special characters, notify the customer to delete them. 5d. If the email is not in the correct email format, notify the customer to change it. 5e. If the username is already used to register, notify the customer to change it.		
Non-functional Requirements	- The password is not saved directly. It must be hashed before saved on the database.		

4.5.2 Mock-up


HCMUT Smart Food Court
Order
About us
Cart
Login
Login
Please login your account


Login
Username:
1
nasdtdasd
Password:
2
Remember me
3
Submit
4
Register here
5
Your account does not exist !
6

HCMUT Smart Food Court
Order
About us
Cart
Login
Sign Up
Hi! Welcome to our Food Court
Let's create new Account to enjoy all our services <3


Sign up
Username:
nhat2000
1
Password:
2
Name:
nhat
3
Email:
xnhat120gmail.com
4
Birthday:
24-Jul-2020
5
Submit
6
Login here
7
Your email format is wrong !
8

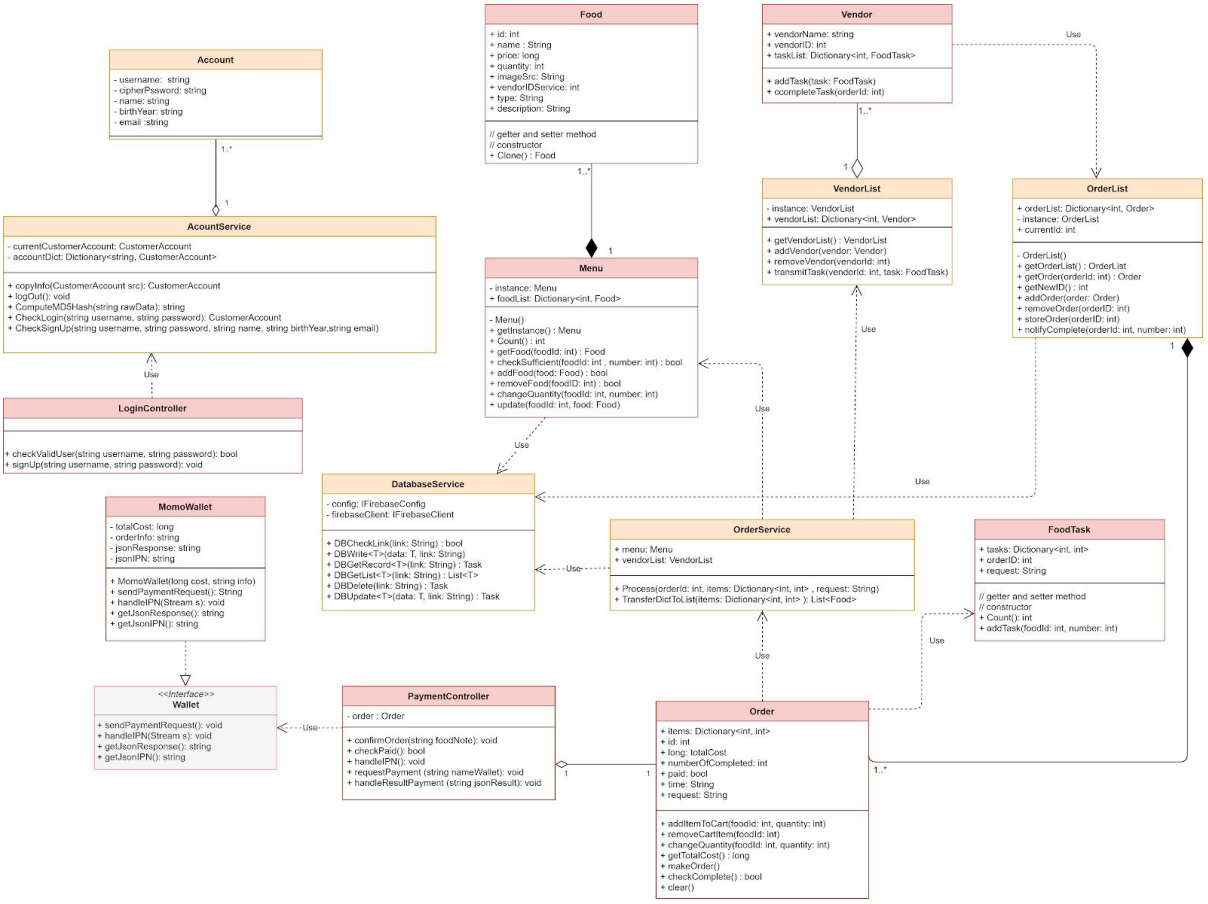
4.5.3 Description

Login						
No	Field Name	Description	Control Type	Data Type	Mandatory	Default Value
1	username	Type username	Text Input	N/A	Yes	Empty String
2	password	Type password	Text Input	N/A	Yes	Empty String
3	remember-me	Remember the account for next time	Check Box	N/A	Yes	False
4	submit	Submit login form to sever	Button	N/A	Yes	N/A
5	register-link	Redirect to “SignUp” page	Label	N/A	Yes	N/A
6	msg	Notice for exceptions	Label	Text	Yes	N/A

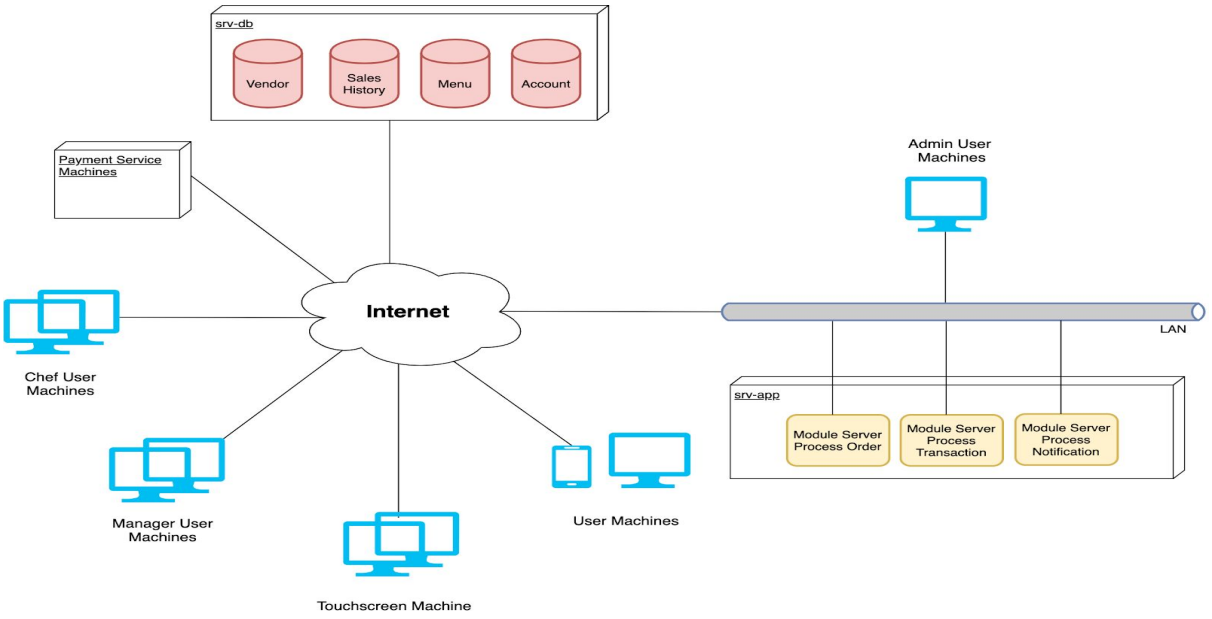
Register						
No	Field Name	Description	Control Type	Data Type	Mandatory	Default Value
1	username	Type username	Text Input	N/A	Yes	Empty String
2	password	Type password	Text Input	N/A	Yes	Empty String
3	name	Type name	Text Input	N/A	Yes	Empty String
4	email	Type email	Text Input	N/A	Yes	Empty String
5	birthday	Type birthday	Date Input	N/A	Yes	Empty String
6	submit	Submit registration form to server	Button	N/A	Yes	N/A

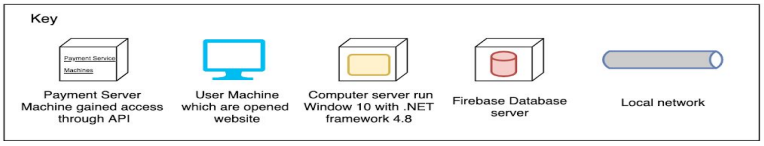
7	login-link	Redirect to “Login” page	Label	N/A	Yes	N/A
8	msg	Notice for exceptions	Label	Text	Yes	N/A

III. IMPLEMENTATION VIEW



IV. ARCHITECTURE DESIGN

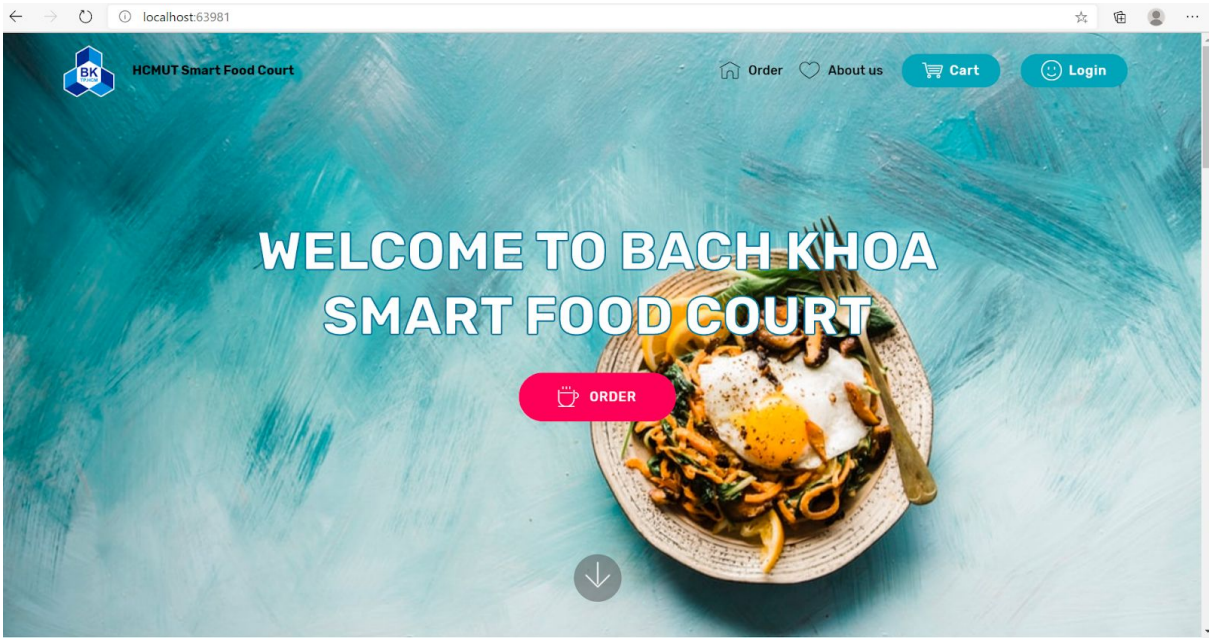




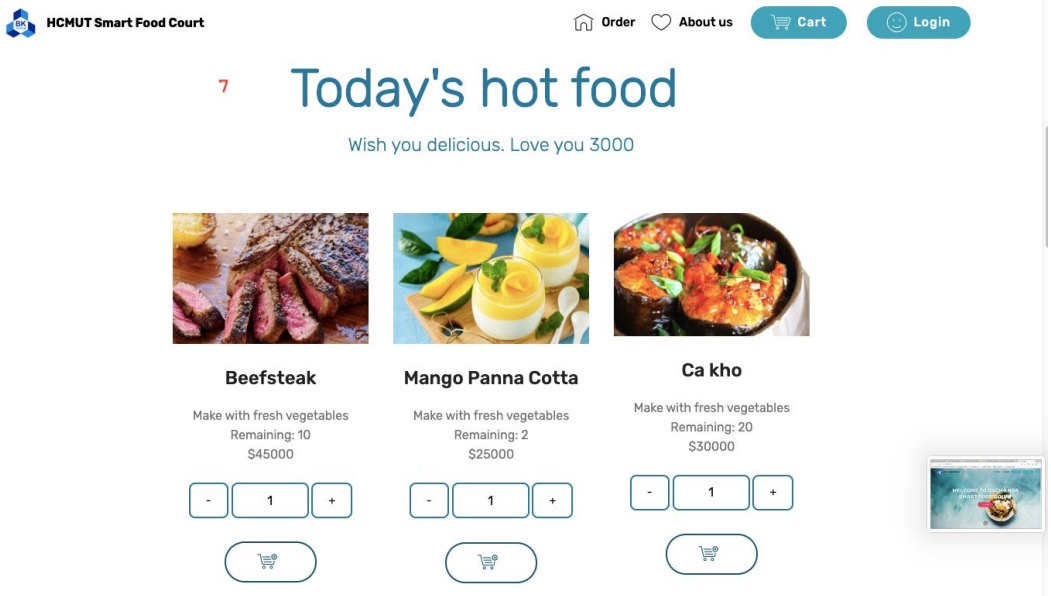
V. EVALUATION

Member	Task	Function	Evaluation
Vo Hoang Hai Nam	Homepage, Signup feature and Class implementation	Homepage design	100%
		View Menu with labels	100%
		Choose number of food	100%
		Sign Up	100%
Huynh Thi Uyen	Cart, Payment feature and Connect to MOMO	Cart View	100%
		Payment UI	100%
		Momo Payment	100%
Nguyen Hoang Nhat	Login, Get report feature and Database implementation	Login	100%
		Get report	80%
		Database CRUD service	100%
Dang Ngoc Tam	Manager UI and Edit menu feature	Manager UI	100%
		Add new food	100%
		Update food	100%
		Remove food	100%
Trang Trong Nghia	Chef UI and Notify feature	Chef UI	100 %
		Notify feature	80 %

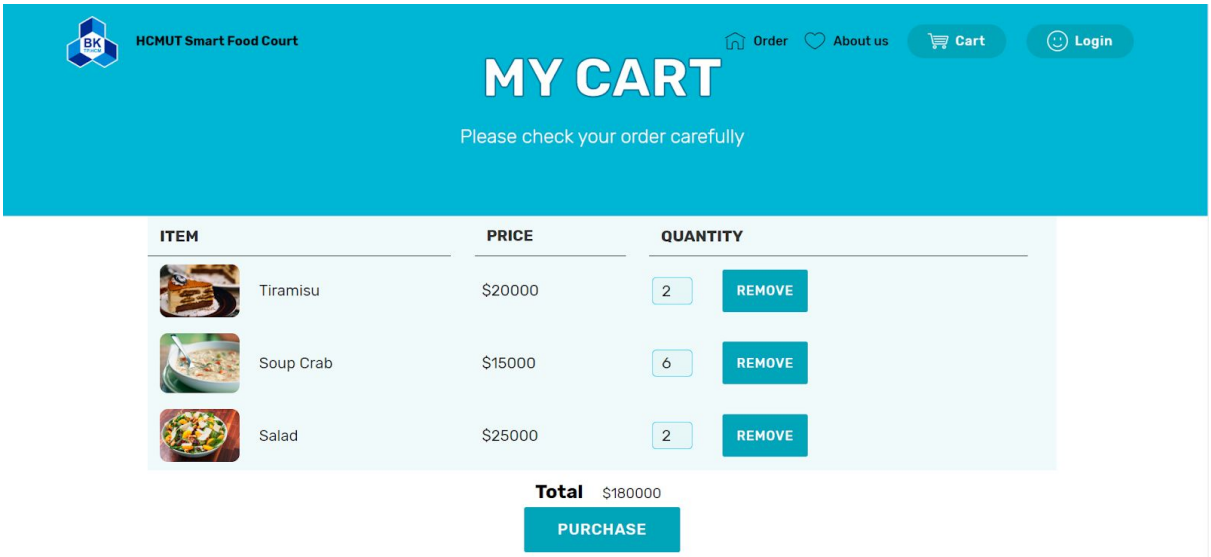
VI. UI PREVIEW



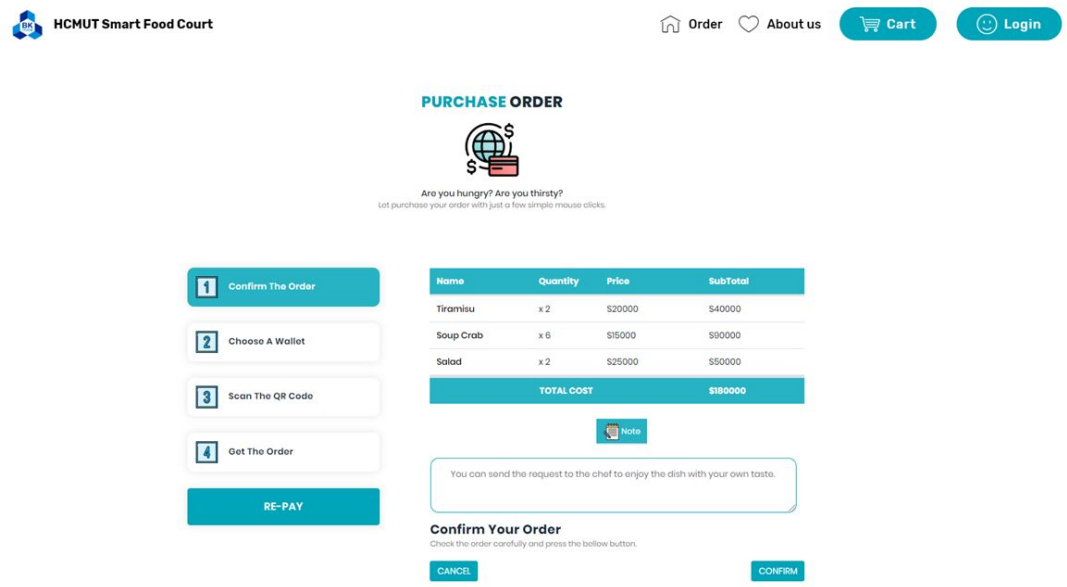
Home page



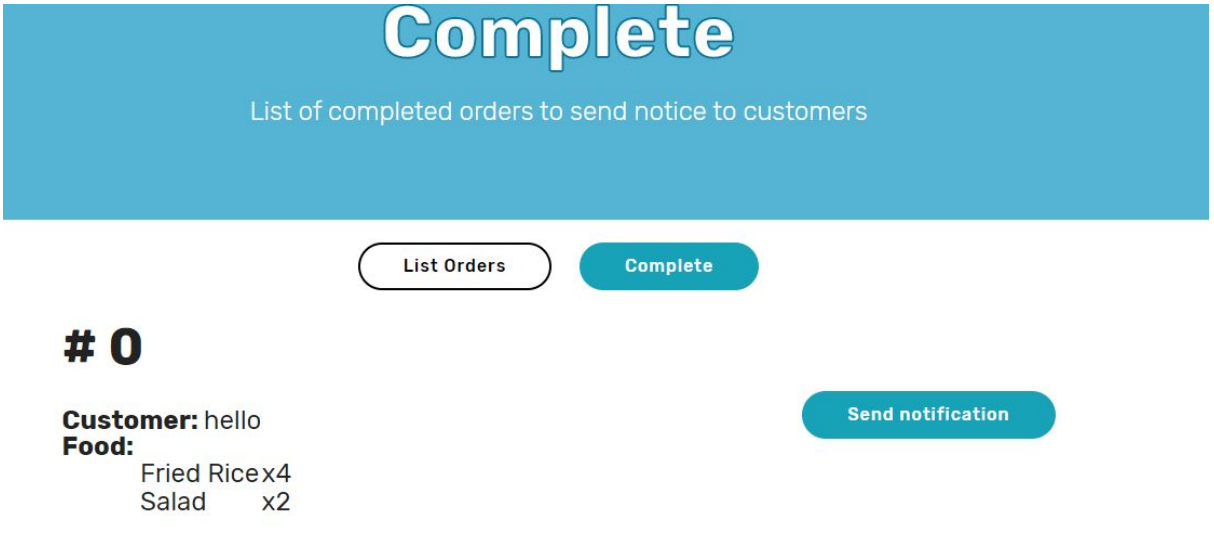
Order View


HCMUT Smart Food Court
Order
About us
Cart
Login
MY CART
Please check your order carefully
ITEM
PRICE
QUANTITY
Tiramisu
$20000
2
REMOVE
Soup Crab
$15000
6
REMOVE
Salad
$25000
2
REMOVE
Total
$180000
PURCHASE

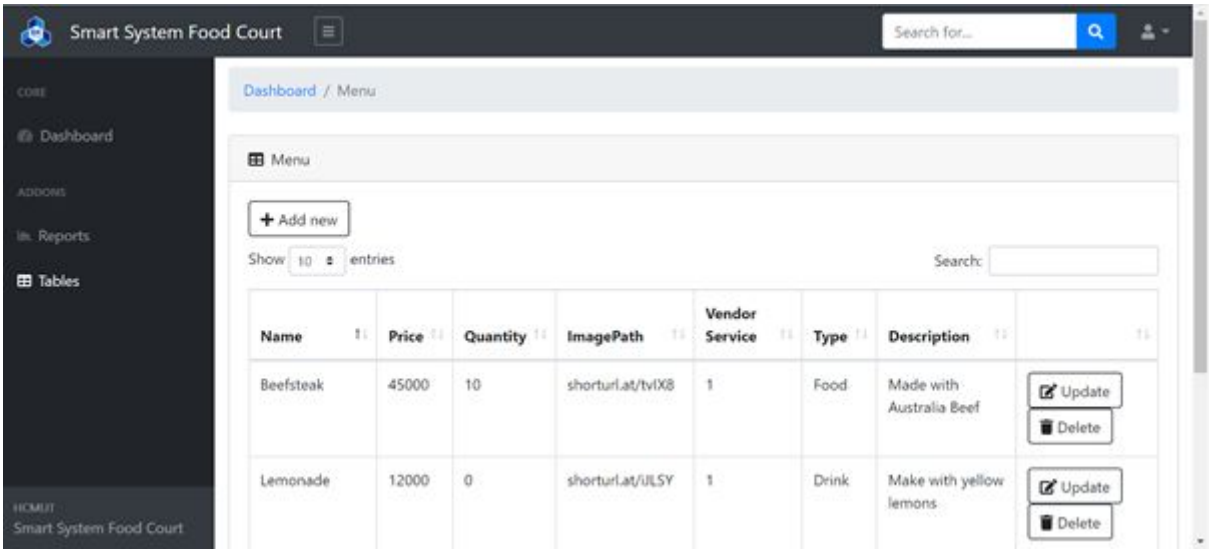
Cart View



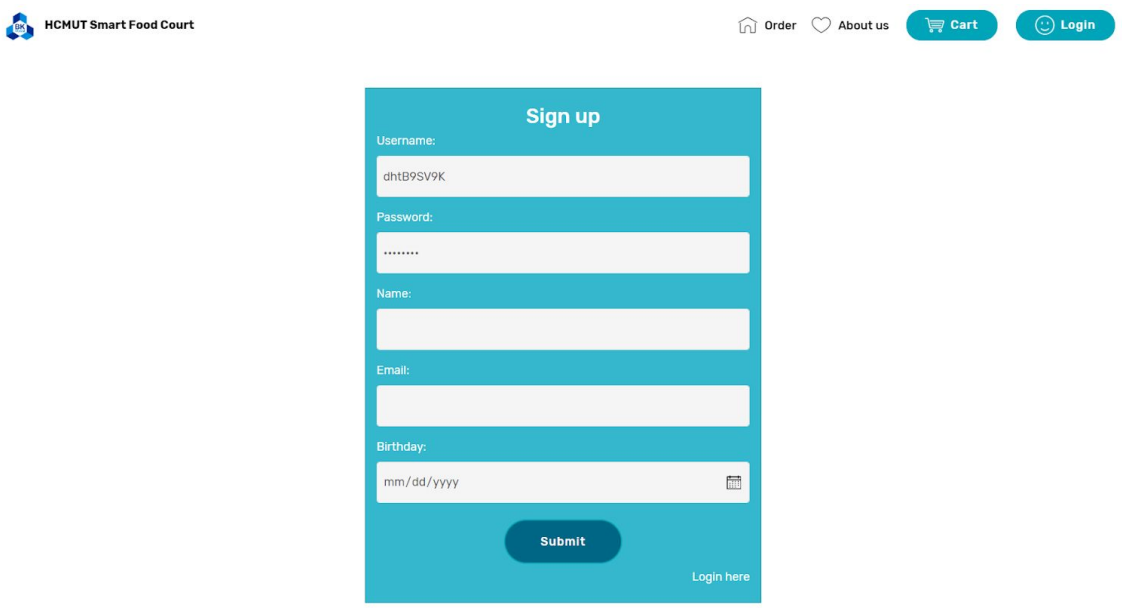
Payment view



Notify View



Manager View



Login View

VII. CONCLUSION

- Github: https://github.com/uyenhuynhuyen/SEFoodCourt
- The interface is almost done. But the system is still slow, some minor bugs still need to be fixed like the amount of food when it runs out. Besides, some functions will be improved later such as customer notification, adding a few types of wallets.
- The project was more than we expected at first, but not really complete. Satisfaction rate is 8/10.