**DUYTAN UNIVERSITY**



**INTERNATIONAL SCHOOL**

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**CMU-SE 100**

**INTRODUCTION TO SOFTWARE ENGINEERING**

**SYNTHESIS REPORT GROUP PROJECT**



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Name Signature Date

Da nang, 12/2023

**PROJECT INFORMATION**

|  |  |
| --- | --- |
| **Project Acronym** | FMS |
| **Project Title** | SelftRestaurant Restaurant Management Software Development Project | | | |
| **Start Date** | 2/12/2023 | **End Date** | 25/12/2023 | |
| **Lead Institution** | International School, Duy Tan University | | | |
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| 4 | Bang, Nguyen Le Trong |  | |  |
| 5 | Cong, Truong Ho |  | |  |

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| **Date:** |  |
|  | **Signature:** |  |
| **Date:** |  |

**REVISION HISTORY**

|  |  |  |
| --- | --- | --- |
| **Version** | **Date** | **Description** |
| **1.0** | 2/12/2023 | **Make Synthesis Report Group Project Document** |
|  |  |  |
|  |  |  |

**TABLE OF CONTENTS**

**1. INTRODUCTION**

### **\*** **Pinpas Seafood and BBQ Buffet - Seafood buffet in Hoa Khanh, Da Nang**

**Business**: Seafood buffet restaurant

**Address**: 41/8 Ngo Thi Nham, Hoa Khanh Nam, Lien Chieu, Da Nang

**Phone number**: 0905 797 262

**Opening hours**: 15:30 - 23:30

**Description**: Pinpas BBQ Buffet Seafood Hot Pot & Grill is one of the must-try delicious buffet restaurants in Da Nang. It serves over 70 grilled dishes, fresh seafood, and the menu is constantly updated for variety. In particular, the restaurant's interior is designed in a Japanese street style that is both unique and casual, creating a sense of familiarity and intimacy.

**2. DESCRIBE BUSINESS PROCESSES OF RESTAURANT**

Here are the main business processes in the operation of a restaurant:

**Table selection process:**

* Customers use a touchscreen at the counter to select a table.
* Customers enter their personal information and the number of customers.
* The restaurant confirms the reservation for the customer.

**Order process:**

* Customers use a touchscreen at the counter to select a meal course.
* The restaurant sends a notification to the chef about the order request when the customer requests it.
* The chef prepares the food requested by the customer and confirms on the system when the food is ready.
* Customers receive a notification when the food is ready.

**Payment process:**

* Customers come to the cashier to pay.
* The cashier enters the table number of the customer and announces the amount.
* Customers pay by cash or card.
* The cashier prints the invoice and returns the change to the customer.

**Raw material management process:**

* The chef enters information about the ingredients needed for the dishes.
* The warehouse manager enters the amount of raw materials in stock.
* The warehouse manager issues the amount of raw materials used.
* The warehouse manager tracks the amount of raw materials in stock to ensure that there are enough raw materials to support the operation of the restaurant.

**Employee management process:**

* The manager manages employee information, including personal information, position, title, salary, etc.
* The manager tracks employee work schedules, attendance, and leave.
* The manager evaluates the performance of employees.

**Financial management process:**

* The manager tracks the revenue, expenses, profit and loss of the restaurant.
* The cashier prepares financial reports daily, weekly, monthly, and annually.

**Customer management process:**

* The restaurant stores customer information, including personal information, reservation history, meal course history, order history, etc.

**Browsing process:**

* Browsers can visit the store's website to see the branches' food offerings for the day

**3. LIST OF PARTICIPANTS TO REQUIREMENTS GATHERING**

The relevant entities to collect requirements are restaurant managers and customers.

**4. THE TECHNICALS USING TO REQUIREMENTS GATHERING**

Request to enter technical methods/techniques:

* Observe
* Questionnaire
* Direct communication based on the restaurant management model

Because:

* Ensure accuracy and completeness of requirements.
* Understand the actual context.
* Increase interaction between requirements collectors and relevant entities.
* Save time, avoid errors when taking requests.
* Don't beat around the bush when getting requests.
* Avoid going off topic when taking requests.
* Maximize all customer requirements.

**5. ASSIGNMENT TEAM MEMBER TO REQUIREMENTS GATHERING**

|  |  |  |
| --- | --- | --- |
| **User name** | **Object** | **The question requires entry** |
| Nguyen Le Trong Bang | Manager | 1. How much money do you want to invest in the new system?  2. What restaurant management functions do you want to have?  3. Are you facing any problems with your current restaurant management?  4. What do you want the software to help you improve?  5. Do you want software with reporting and data analysis capabilities?  6. How do you want it to work?  7. How long do you want this system to complete?  8. What platform do you want the system to operate on?  9. Do you have any software requirements?  10. Do you have any special requests about this software?  11. What are you looking for in a restaurant management software?  12. Do you want the software to be integrated with your other systems? |
| Kieu Duc Chung | Client | 1. For what purpose do you usually go to restaurants?  2. Are you satisfied with the service quality of your current restaurant?  3. What do you usually order?  4. What additional services do you want the restaurant to have? |

**6. INTRODUCTION PROJECT**

**6.1. Project Objectives**

To develop a restaurant management software that is user-friendly, easy to use, and has many features to support management tasks. The software must be secure and accurate, and it must help businesses save time, money, and labor. It must also help businesses avoid errors, confusion, and losses that can occur with manual management.

**Specifically, the software should include the following functions:**

* **Customer management:** The software should be able to track customer information, including names, addresses, phone numbers, and dietary restrictions.
* **Invoice management:** The software should be able to generate invoices, track sales, and manage inventory.
* **Table management:** The software should be able to track table availability, assign tables to customers, and track orders.
* **Food management:** The software should be able to track food inventory, create menus, and manage orders.

The software should be designed to be easy to use for both employees and customers. It should also be secure and accurate, to protect customer data and ensure that financial transactions are processed correctly.

This software would be a valuable tool for restaurant businesses. It would help them to improve efficiency, save money, and reduce errors.

**6.2. Project Scope**

**Deliverable:** Restaurant management software system consisting of the following modules:

* **Order placement:** For customers to use to order food.
* **Chef section:** For chefs to use to manage food and confirm that food is ready.
* **Cashier section:** For cashiers to use to process payments for customers.
* **Web browsing section:** For customers to use to view information about therestaurant's food.

**6.3 Identify the Functional Requirement & Non-Functional Requirement**

## **a)** **High level Functional Requirement (FR)**

Functional Requirements:

|  |  |  |
| --- | --- | --- |
| **FR** | **Title** | **Create New place** |
| FR1.1 | Order Placement | Display a list of food items that are available for dine-in at the branch, along with their prices. Allow customers to select food items and quantities through a touchscreen. Display a notification when the food is ready. Display the current bill, including the number of items ordered, which items are ready, and the total amount. Allow customers to scan a card to earn loyalty points. |
| FR1.2 | Chef Section | Allow chefs to add or remove food items from the menu. Display information about the food item and the quantity needed when there is a food order request from customers. Allow chefs to confirm when the food is ready. |
| FR1.3 | Cashier Section | Allow cashiers to view a list of food orders that have been placed, and then process payments for them. Print the total daily revenue along with a list of food items that have been ordered in a day. |
| FR1.4 | Web Browsing Section | Allow users to access the restaurant's website to view the food items that are available for dine-in at the branches. |

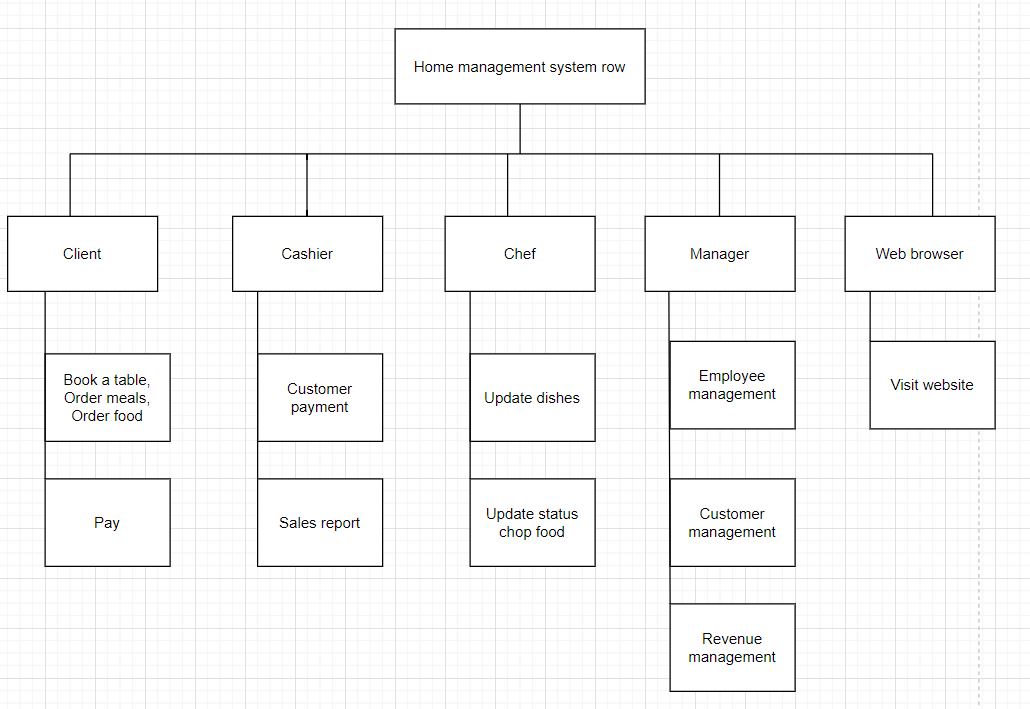
**b) List of Non-Functional Requirement**

Non-Functional Requirement:

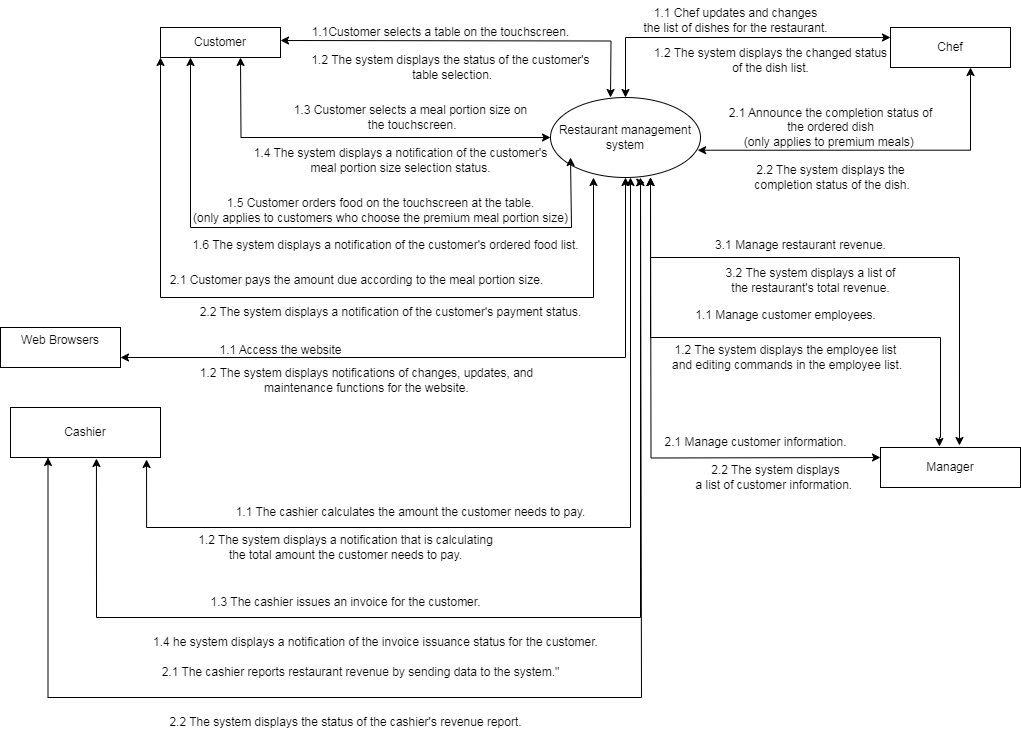
* The customer module must run on touchscreen devices (iPhone/iPad/Android) placed at the tables.
* The chef and cashier modules must run on WinForm/WebForm platforms.
* The system must be user-friendly.

**7. THE USER REQUIREMENT ANALYSIS**

**7.1 Business Function Diagram**

**7.2 Context Model**

**a) Context Model**

**b) System Context Description**

**7.3 List of Actor**

**Admin:** Manage account

**Customer:** Order food, check bill, pay, scan card for loyalty points

**Cashier:** Process payment, print receipt, generate daily revenue report

**Chef:** Manage menu, confirm food is ready

**7.4. List of Use Cases**

|  |  |  |
| --- | --- | --- |
| **Use case ID** | **Use case name** | **Functional Req.** |
| *UC.01* | *Account management* | *Admin adds, edits, deletes and assigns user rights.* |
| *UC.02* | *Order meals* | *The system displays the meal on the screen and the customer orders the meal.* |
| *UC.03* | *Oder foods* | *The customer orders the food and the chef prepares the dish and then announces when the dish is ready* |
| *UC.04* | *Pay* | *Customers pay at the counter and the cashier sends the bill to the customer* |
| *UC.05* | *Sales report* | *The cashier prepares a report on total sales for the day along with a list of meals ordered during the day* |
| *UC.06* | *Visit website* | *Browsers can visit the store's website to see what dishes are on offer* |
| *UC.07* | *Employee manager* | *Manage employee lists* |

**8. PROJECT PLAN**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No | Task Name | Duration | Start | Finish | Resource Names |
| 1 | **Initial** | 17 days | Sat 02/12/23 | Mon 25/12/23 | Chung,Bằng,H.Anh,C.Anh,Công |
| 1.1 | Project Kick-off Meeting | 1 day | Sat 02/12/23 | Sat 02/12/23 | Bằng,C.Anh,Chung,H.Anh |
| 1.2 | Discuss about project ideal | 1 day | Sat 02/12/23 | Sat 02/12/23 | Bằng,C.Anh,Chung,H.Anh |
| 1.3 | Create Proposal Document | 1 day | Sat 02/12/23 | Sat 02/12/23 | Bằng,C.Anh,Chung,H.Anh |
| 1.4 | 1. Introduction | 1 day | Sun 03/12/23 | Sun 03/12/23 | Bằng,C.Anh,Chung,H.Anh |
| 1.5 | 2. Describe Business Processes Of Restaurant | 1 day | Sun 03/12/23 | Sun 03/12/23 | Bằng,C.Anh,Chung,H.Anh |
| 1.6 | 3. List Of Participants To Requirements Gathering | 1 day | Sun 03/12/23 | Sun 03/12/23 | H.Anh |
| 1.7 | 4.The Technicals Using To Requirements Gathering | 1 day | Mon 04/12/23 | Mon 04/12/23 | Bằng,Công,Chung |
| 1.8 | 5.Assignment team member to requirements gathering | 1 day | Mon 04/12/23 | Mon 04/12/23 | Bằng,Công,Chung |
| 1.9 | 6.1. Project Objectives | 1 day | Tue 05/12/23 | Tue 05/12/23 | H.Anh |
| 1.10 | 6.2. Project Scope | 1 day | Tue 05/12/23 | Tue 05/12/23 | H.Anh |
| 1.11 | 6.3 Identify the Functional Requirement & Non-Functional Requirement | 1 day | Wed 06/12/23 | Wed 06/12/23 | Bằng,C.Anh,Công,Chung,H.Anh |
| 1.12 | 7.1 Business Function Diagram | 1 day | Thu 07/12/23 | Thu 07/12/23 | Bằng,H.Anh |
| 1.13 | 7.2 Context Model | 1 day | Fri 08/12/23 | Fri 08/12/23 | C.Anh,H.Anh |
| 1.14 | 7.3 List of Actor | 1 day | Sat 09/12/23 | Sat 09/12/23 | H.Anh |
| 1.15 | 7.4. List of Use Cases | 1 day | Sat 09/12/23 | Sat 09/12/23 | H.Anh |
| 1.16 | 8.Project plan | 1 day | Sun 10/12/23 | Sun 10/12/23 | Bằng,C.Anh,Công,Chung,H.Anh |
| 1.17 | 9.Technical Constraints | 1 day | Mon 11/12/23 | Mon 11/12/23 | Bằng,C.Anh,Công,Chung,H.Anh |
| 1.18 | 10.1. Use Case Diagram | 2 days | Tue 12/12/23 | Wed 13/12/23 | Chung |
| 1.19 | 10.2. List of Business Rule | 1 day | Thu 14/12/23 | Thu 14/12/23 | Bằng,C.Anh,Công,Chung,H.Anh |
| 1.20 | 10.3. Activity Diagram | 3 days | Fri 15/12/23 | Tue 19/12/23 | C.Anh |
| 1.21 | 11. Interface Design | 2 days | Sun 17/12/23 | Mon 18/12/23 | Công,H.Anh |
| 1.22 | 12. Configuration Management | 1 day | Wed 20/12/23 | Wed 20/12/23 | Bằng,H.Anh,Chung |
| 1.23 | 13. Testing | 1 day | Thu 21/12/23 | Thu 21/12/23 | Công,H.Anh |

**9.** **TECHNICAL CONSTRAINTS**

### **9.1 Technical to develop:**

* ***Languages****: Python, Nodejs, React Native, Reactjs*
* ***Server:*** *Socket.io*

### **9.2 Environment:**

* ***Web browsers****: Google Chrome, Molliza Firefox, Apple Safari, Cốc Cốc, Microsoft Edge.*
* ***Environment:*** *Microsoft windows, Mac Os, Android, iOS,..*

### **9.3 Another:**

* ***Management tool****: Trello, Slack*
* ***Design tool****: Figma*
* ***Manage Source code tool****: Git,Github*
* ***Test tool*** *: Katalon Studio*

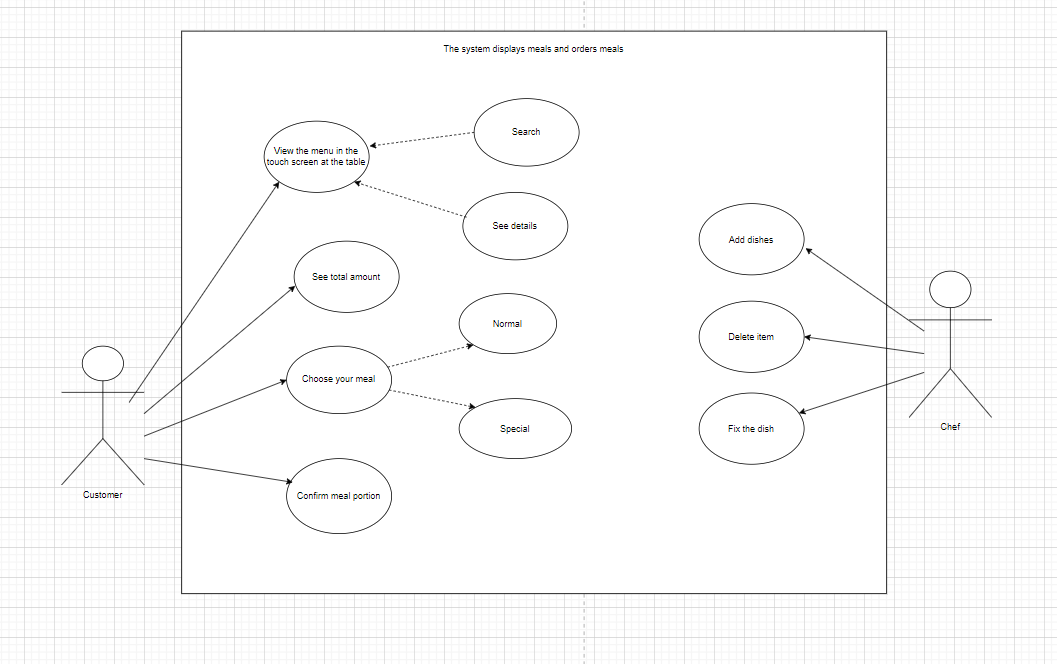
**10. ANALYSIS & MODELING REQUIREMENT**

**10.1. Use Case Diagram**

1.Account management:

## Không có mô tả.

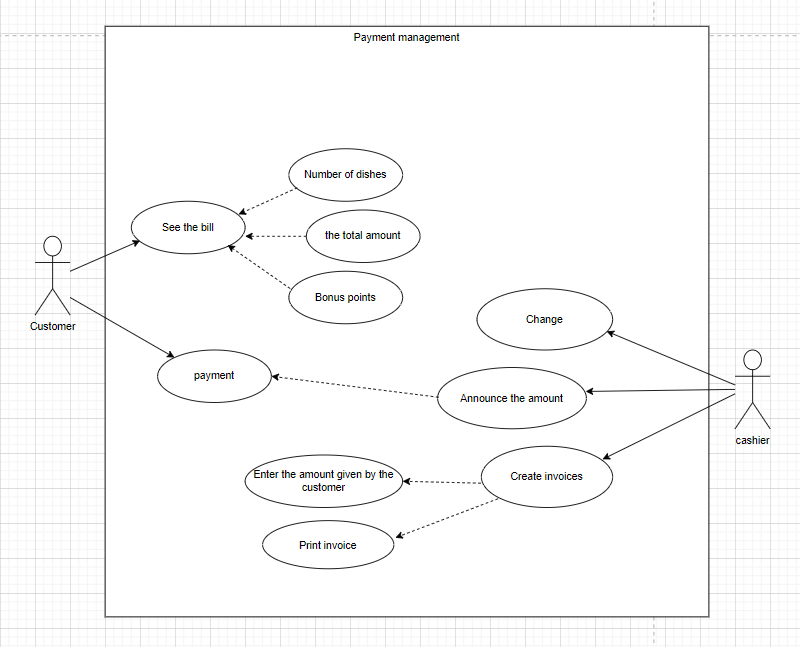
## 2. The system displays meals and orders meals:



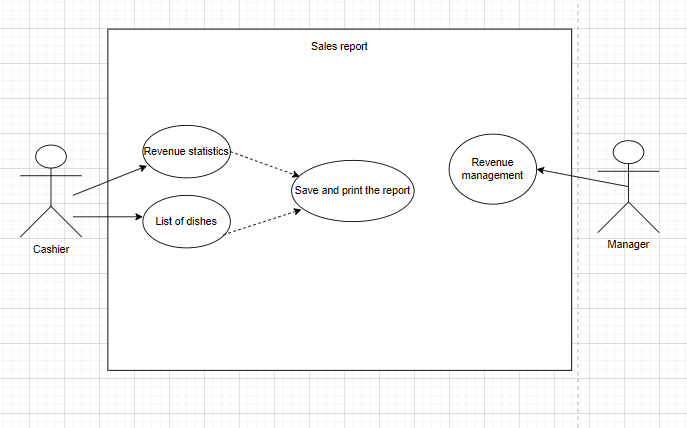
## 3.Advanced ordering system:

## 

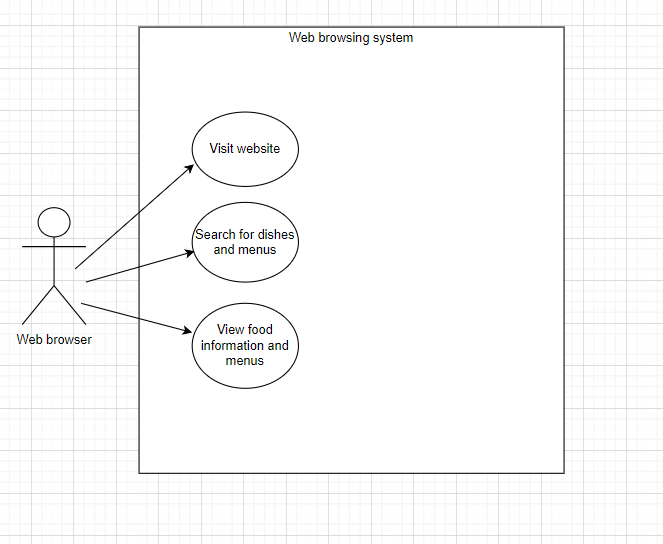
4.Payment management:



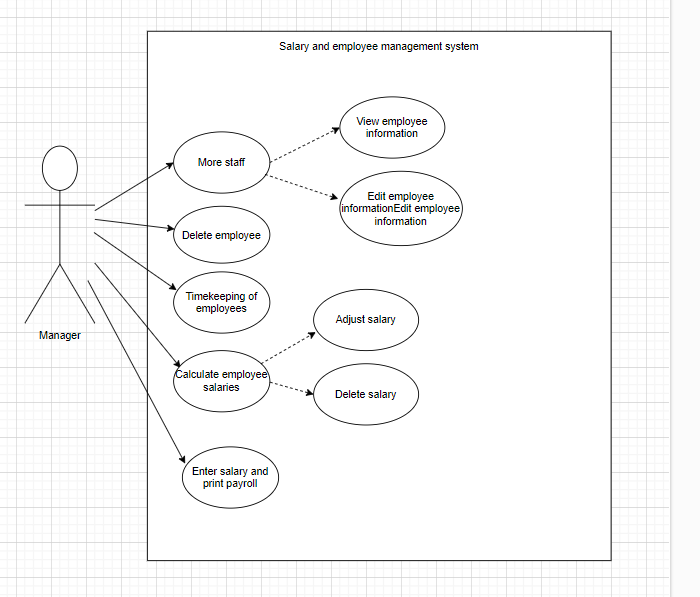
5.Sales report:



6.Web browsing system:



7.Salary and employmee management system:



## **10.2.** **List of Business Rule**

|  |  |  |
| --- | --- | --- |
| Code | Business rules | Use case |
| *BR1* | *Rank of a user will be se based on the user’s*  *contribution point (CP)* | *UC.02* |
| *BR2* | *Contribution Point (CP) is calculated as follow:*  *‐ Starter point for every user is 10 points*  *‐ Create a place: + 20 point*  *‐ Your place gets deleted: ‐ 25 point* | *UC.02* |
| *BR3* | *For user has more than 1000 point (senior user):*  *‐ Can edit a place directly*  *‐ Can upload place’s image directly*  *‐ Can approve suggested edit*  *‐ Can approve suggested images*  *‐ Set a revision as current* | *UC. 02* |
| *BR4* | *For user has less than 1000 point (junior user):*  *‐ a revision of a place created by these users*  *need approvals from senior users or admins to be*  *displayed* | *UC.02* |

**10.3. Activity Diagram**

**a) The steps performed of function abc….**

1.Login function

|  |  |
| --- | --- |
| Actor Action | System Response |
| 1.Visit the restaurant's website | 2. Displaying access to the website leading to the main interface of the website. |
| 3.User types usename and password  .The person who activates the login button. | 4.Display "Entering". The system checks whether the usename and password are correct? |
| 6.The user returns to the step of re-entering the usename or password. | 5.If the username or password is not correct, return to the entry step |
|  | 7.If the username and password are correct, allow the user to log in to the main page of the website. |

2. Function Set a table and choose the meal size.

|  |  |
| --- | --- |
| Actor Action | System Response |
| 1.Customers choose the meal size and reserve a table on the touch screen at the counter. | 2.Display a list of selected table codes (except for selected tables) and serving sizes. |
|  | 3. The system confirms the request. If the customer chooses a premium meal, he or she can order additional dishes. |
|  | 4.The system sends information to the chef for preparation. |
|  | 5. If diners choose a regular meal, they are not allowed to order additional dishes. |
|  | 6. The system receives customer information announcing Completed, please go to the selected location. |

3. Food ordering function.

|  |  |
| --- | --- |
| Actor Action | System Response |
| 1.Customers select the dishes they want to order on the touch screen (only applies to premium meals) | 2.Displays a list of selected dishes. The system records the customer's selected dishes. |
|  | 3.The system sends dish list information to the kitchen area. |
| 4.The chef receives a list of dishes, activates the button preparing the dish. | 5. The system sends a notification to customers "Preparing food, please wait". |
| 6.Customers can return to the main screen to order more dishes or keep the notification unchanged |  |
| 7.The chef presses the button to complete the dish. | 8.The system sends a notification to customers. Your dish is ready, please come to the counter to receive your food. |
| 9.Customers click on the confirmation button and go to the counter to receive food. | 10. Notification system Wishing you a delicious meal. Order recording system. |

4. Function to update and change dishes.

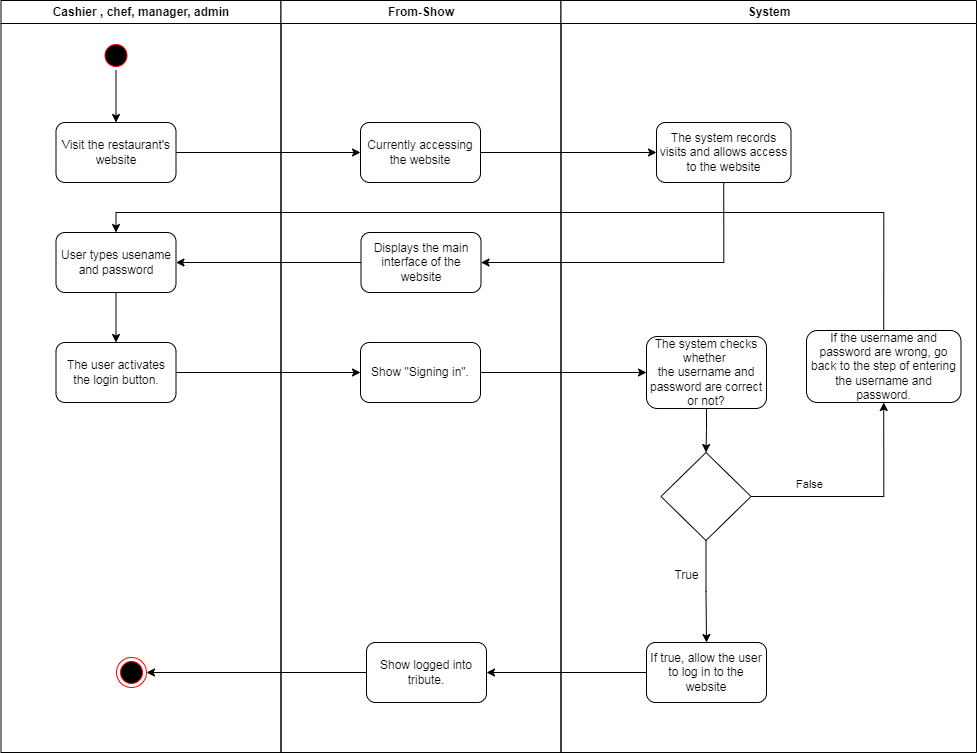
|  |  |
| --- | --- |
| Actor Action | System Response |
| 1. Chef changes the dish categories. | 2. The system displays a list to enter changes to dishes. The system stores the history of changing the list of dishes. |
|  | 3.The system confirms the request to change the dish list and displays "Dish list changed successfully". |

5.Bill payment function

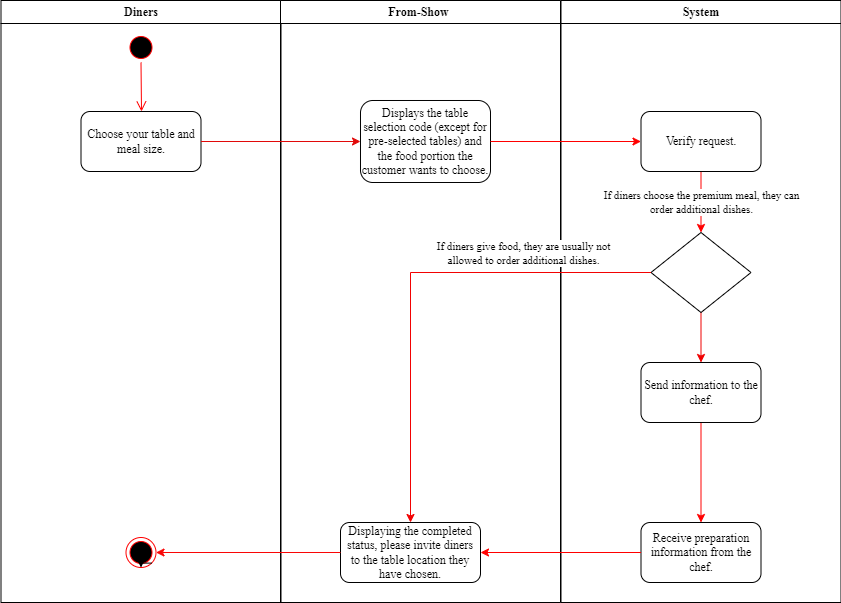
|  |  |
| --- | --- |
| Actor Action | System Response |
| 1. The employee enters the meal rate and number of guests traveling together | 2. The system displays the table for entering food levels and other quantities. |
| . | 3.The system stores the total amount the customer needs to pay and displays a notification to the customer. |
| 4.The employee informs the customer of the amount to be paid. |  |
| 5.Customers pay the cashier |  |
| 6.The cashier checks the amount  If the customer pays, the excess amount will be returned to the customer.  If there is a shortage, notify the customer to pay the remaining amount.  If enough Employees activate the paid button. | 7. The system reports successful payment. The system saves the transaction history and prints an invoice. |
| 8.The employee receives the bill from the restaurant and gives the bill to the customer |  |
| 9.Customers receive invoices. |  |

**b) Activity Diagram of function abc….**

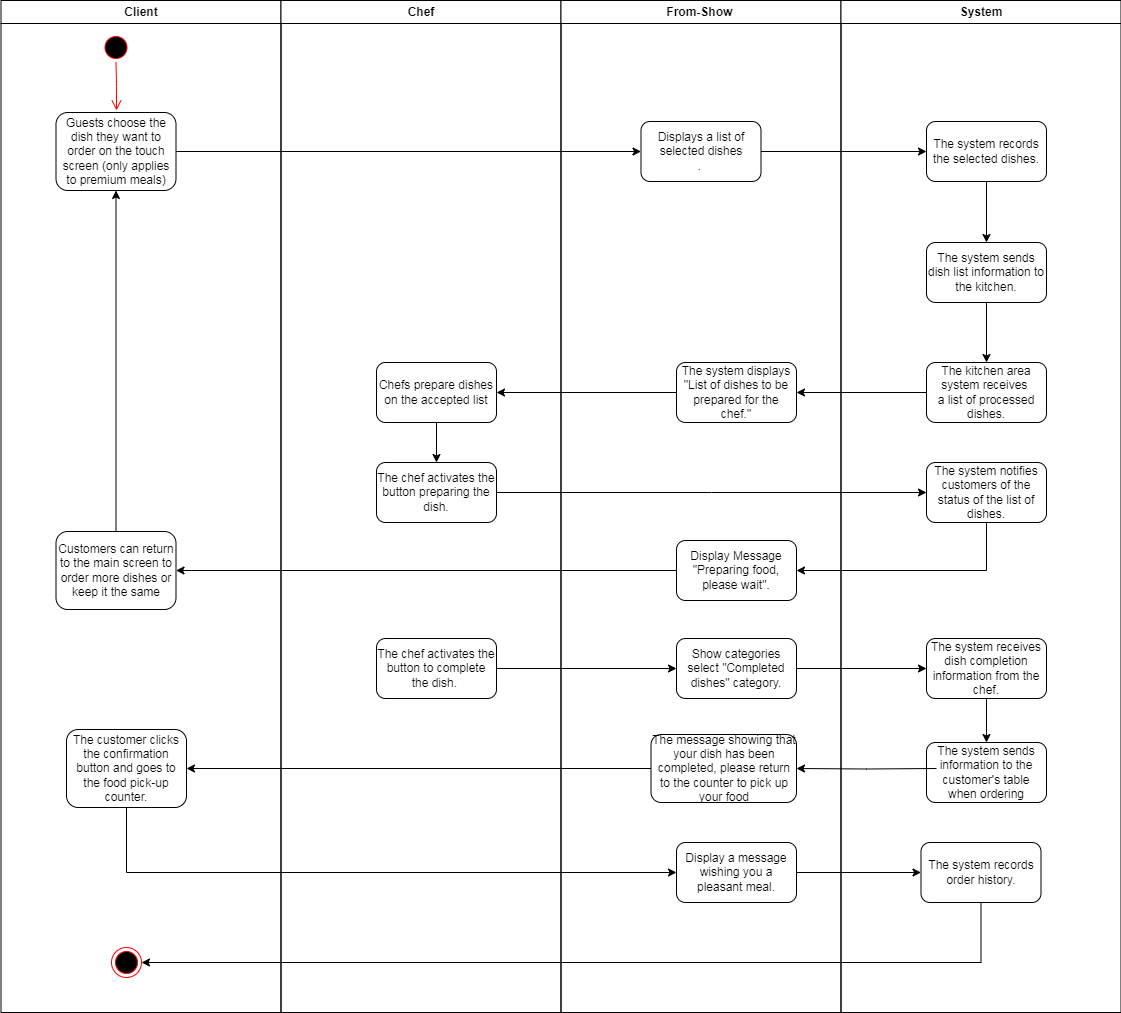
1.Login web function.

**

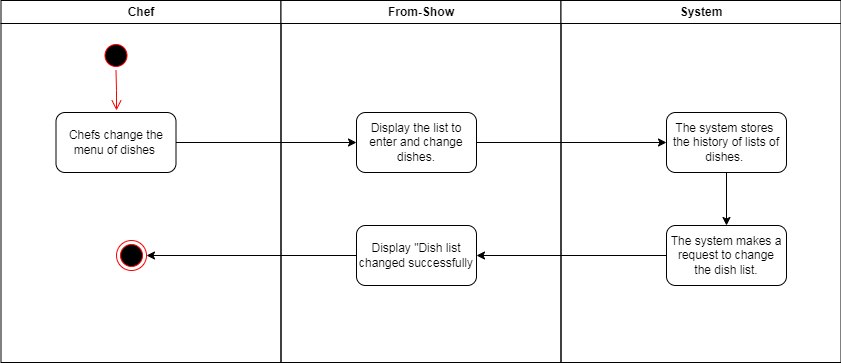
2. Set tables and choose meals for customers function.



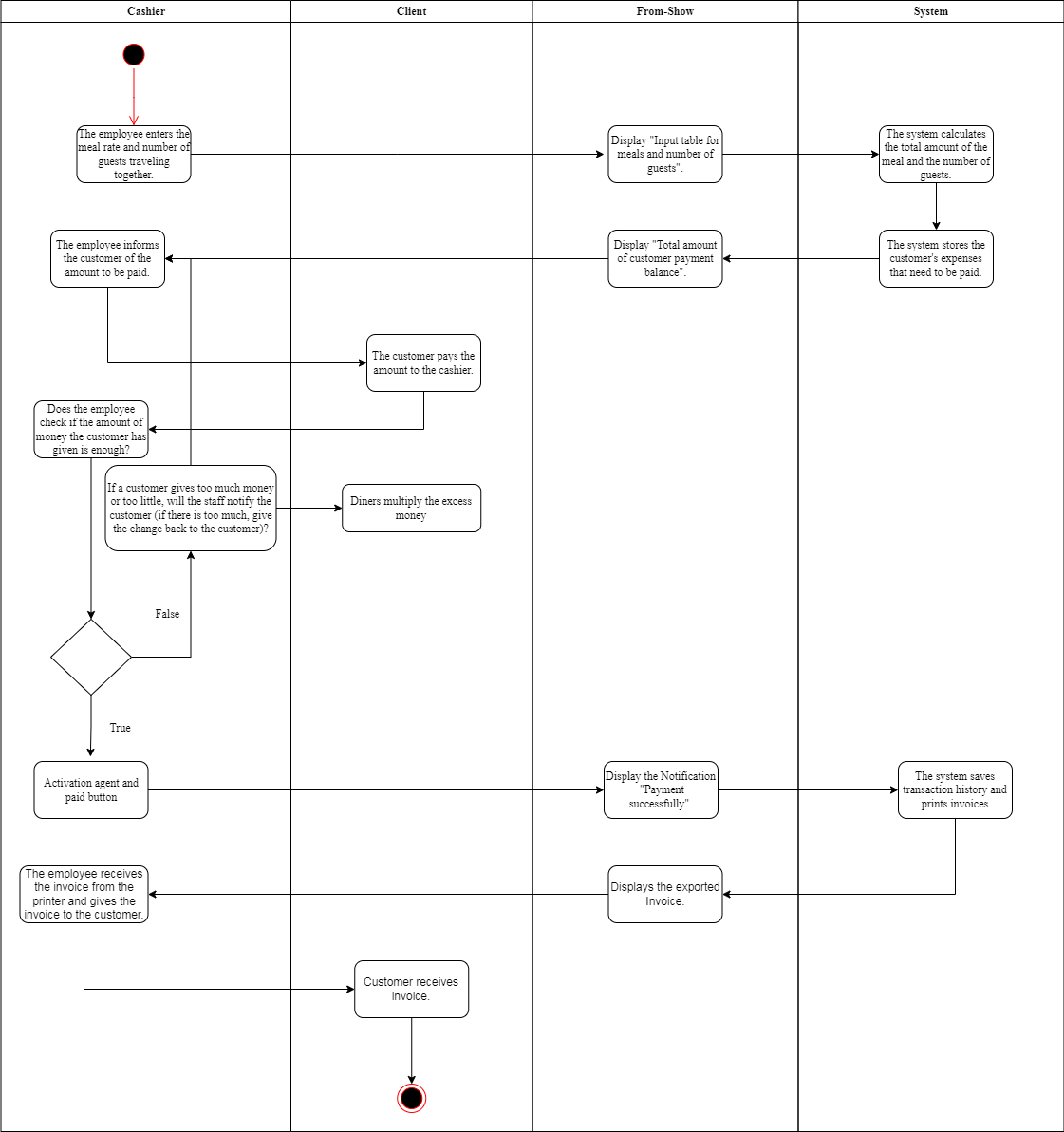
3. Order function.

****

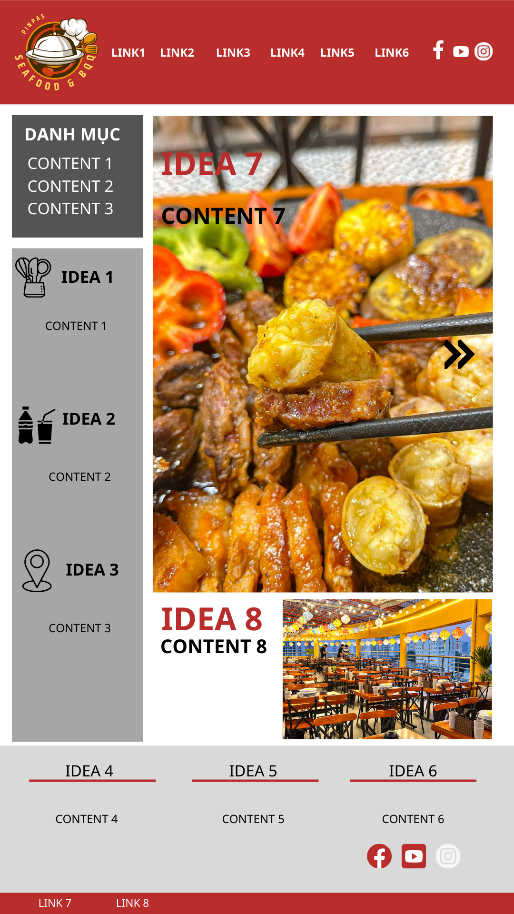
4.Update and change dishes function.

****

5. Pay the bill function.

****

**11. INTERFACE DESIGN**

****

**11.1. Introduction tool design**

Canva is an online graphic design tool that helps users create beautiful, professional designs without needing design knowledge. Canva can be used to create many different types of designs, including web designs.

Canva offers a collection of web design templates, from professional business websites to creative personal websites. Users can easily customize these templates to fit their needs.

**11.2 User Interface Design for ABC Function**

1.Table booking process:

****

2.Order meals process:

****

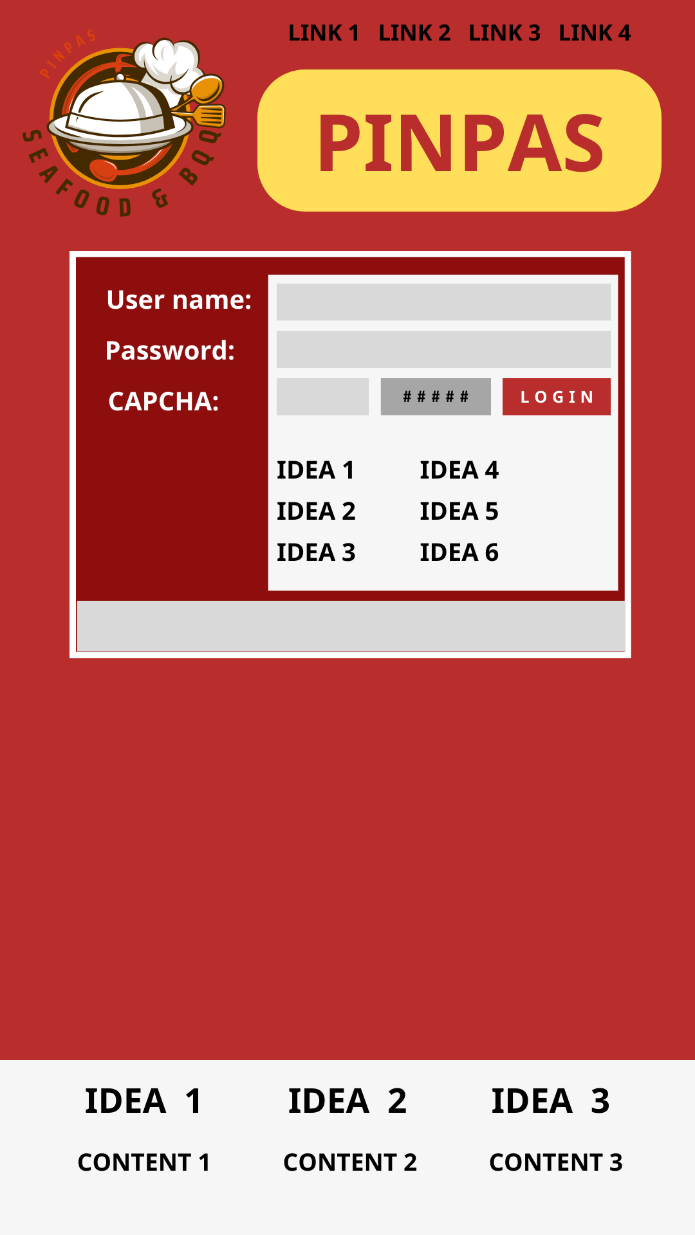
3.Order food process:

****

4.Pay process:

****

5.Login:

****

**12. CONFIGURATION MANAGEMENT**

**a) Introduction the tool Source Code Management**

**Introduction to GitHub:**

GitHub is an online source code hosting platform based on the Git distributed version management system. It is used by software developers to store, manage, and collaborate on source code.

**Benefits of using GitHub**

GitHub offers many benefits to software developers, including:

* Source Code Protection: GitHub helps protect source code from loss or damage.
* Increased productivity: GitHub helps developers manage their source code more efficiently
* Increased collaboration: GitHub allows developers to collaborate on their source code more easily.

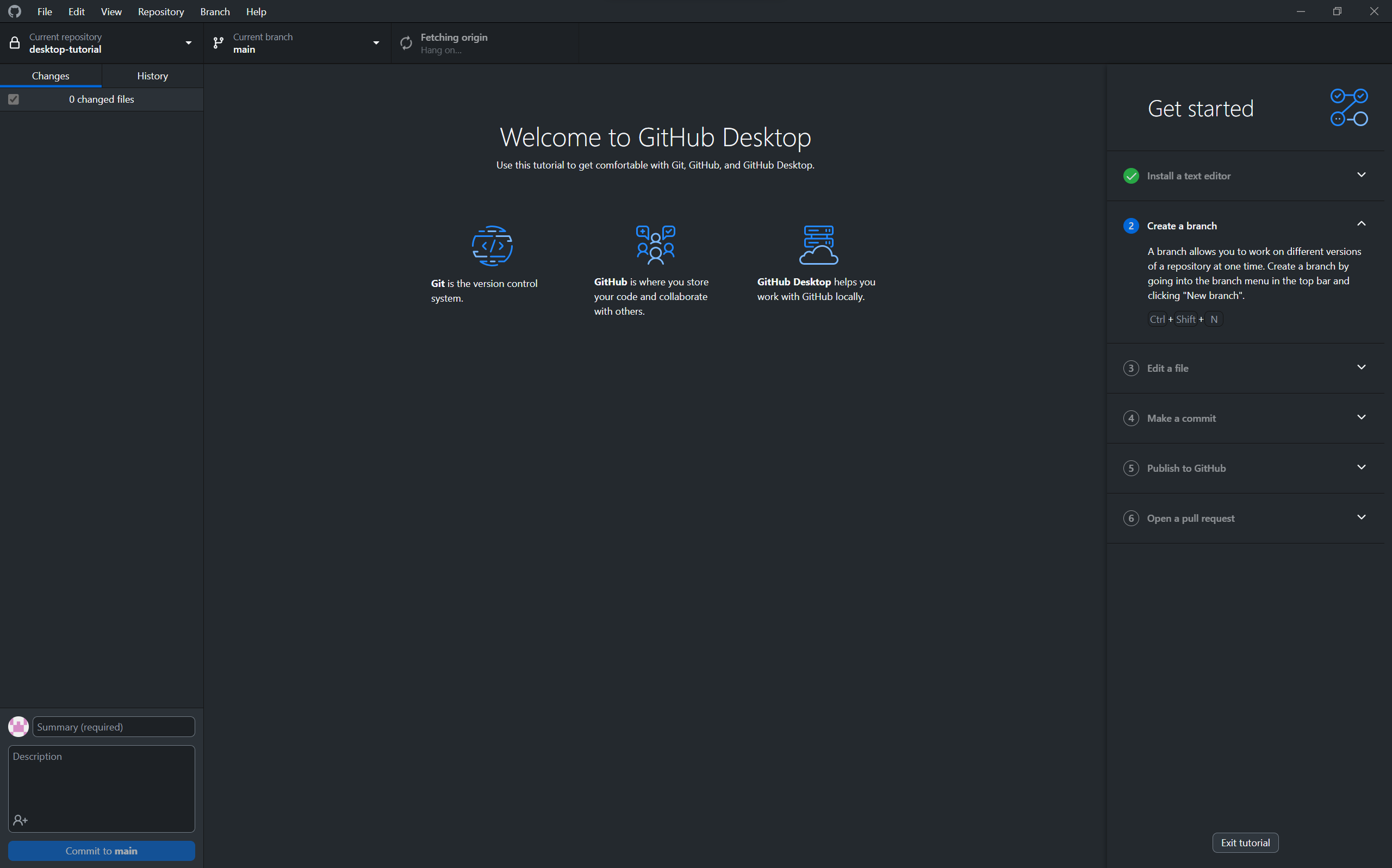
**How to use GitHub**

* To use GitHub, you need to create a free account. After creating an account, you can create a new repository to store your source code. You can upload your source code to the repository using a web browser or the GitHub application.
* Once your source code is uploaded, you can start managing it using GitHub's tools. For example, you can use a change tracking tool to track changes made to your source code. You can also use branching and merging tools to collaborate with other developers on your source code.

**b) Introduction Key Functional**

1. **Repository Management:**  
   Create a new repository to store project source code.  
   Clone the repository to work locally.  
   Integrate tools like Git LFS (Large File Storage).
2. **Commit and Push:**  
   Commit changes to save local state.  
   Push commits to share with the team.
3. **Branching and Merging:**  
   Create and manage branches to develop new features.  
   Merge branches to integrate changes into the main branch.
4. **Pull Requests:**  
   Create Pull Requests to propose changes to the main branch.  
   Review and comment on Pull Requests before merging.
5. **Issues and Labels:**Create issues to track tasks and project concerns.  
   Use labels to mark and categorize issues.
6. **Wiki and Projects:**Create a Wiki for documentation and project guidance.  
   Create and manage projects to track work progress.
7. **Actions (CI/CD):**  
   Provide built-in CI/CD tools directly within GitHub.  
   Automate testing and deployment processes.
8. **Security and Dependabot:**  
   Integrate security tools to check source code.  
   Use Dependabot to track and update dependencies.
9. **Social Coding and Communication:**  
   Follow contributors, star, and fork projects.  
   Communicate through comments, discussions, and pull requests.
10. **Community and Interaction:**Rate and discuss other projects.  
    Fork and contribute to open-source projects.
11. **API and Integration:**  
    Use the API to interact and integrate GitHub with other services.

**c) The Screen Shot apply Source Code Management of team**

****

**13. TESTING**

**a) Introduction to method testing apply of this project**

Black box testing is a software testing method in which the tester does not need to know the internal structure of the software. The tester only focuses on the inputs andoutputs of the software to verify whether the software meets its functional requirements.

**b) Test Cases**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Testcase ID | Requirment ats ID | Test case description | Step | Data | Estepted result |
| 1 | TC01-1 | Login | Log in to the restaurant's system login page, login name and password are wrong | 1.The manager accesses the system 2.Next, the manager presses enter | Username = "quanlinhahang" Password "2345" | Display message: "Incorrect username and password" |
| 2 | TC01-2 | Login | Log in to the restaurant system, account and password are empty | 1.The chef accesses the system 2.Next, the chef presses enter 3.The chef does not enter the login name and password in the Username and Password box 4.The user clicks on the Login box | Username = " " Password = " " | Display message: "No Username has been entered" |
| 3 | TC01-3 | Login | Log in to the restaurant system, account is empty | 1.Employee accesses the system 2.Next, employee presses enter 3.Employee does not enter login name in Username box 4.Employee enters password in Password box 5.Employee clicks in Login box | Username = " " Password = "@nhahang.vn" | Display message: "No Username has been entered" |
| 4 | TC01-4 | Login | Log in to the restaurant system, password is empty | 1.Admin logs in to the restaurant system 2.Next, Admin presses enter 3.Admin enters the login name in the Login Name box 4.Admin does not enter a password in the Password box 5.Admin enters the correct CAPCHA in the yes box the characters next to 6.Admin click on the Login box | Username = "nhahang" Password = " " | Display message: "Password not entered" |
| 5 | TC01-5 | Login | Log in to the restaurant system, the account does not exist | 1. Adimin logs into the system 2. Next, Admin presses enter 3. Admin enters username and password in the Username and Password boxes 4. Admin enters the correct CAPCHA in the box with the characters next to 5 .Admin click on the Login box | Username = "khongtontai" Password = "@nhahang123" | Display message: "Incorrect username or password" |

**14. CONTRIBUTION**

*<Team member contributed significantly to team's success (%)>*

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| --- | --- | --- | --- | --- |
| **No.** | **Participant**  *<Họ tên>* | **Role**  *<Vai trò>* | **Responsibilities**  *<Trách nhiệm cụ thể được phân công, đóng góp cho bài tập nhóm>* | **%**  *Mức độ (%) đóng góp cho bài tập nhóm* |
| 1 | Anh, Ngo Hoang | Leader | Leader, instructor, supervisor, user interface design**(80%**), problem identification and solving | 30% |
| 2 | Bang, Nguyen Le Trong | Member | Requirement gathering questioner, requirements engineer**(40%)**, BFD designer.  On-time delivery, effective contribution. | 20% |
| 3 | Chung, Kieu Duc | Member | Use case designer, requirement gathering questioner, requirements engineer**(40%)**.  On-time delivery, effective contribution | 20% |
| 4 | Anh, Cao Le Tuan | Member | Activity Diagram designer, Context model designer.  On-time delivery, effective contribution. | 20% |
| 5 | Cong, Truong Ho | Member | Tester, user interface design**(20%),** requirements engineer**(20%)**  Interested in contributing. | 10% |