VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY
UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING

SOFTWARE ENGINEERING (CO3001) - CC02

Assignment 1

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Contents

1 Workload

No.	Date	Task	Member
1	10/09/2021	Meeting, dicussion about assignment	All members
2	11-15/09/2021	Task 1.1, Task 1.2, Task 1.3	Trí, Tú, Việt
3	15/09/2021	Meeting review task answers	All members
4	16-20/09/2021	Complete Latex report for task 1	Tiến, Việt, Sáng, Tú
5	21-24/09/2021	Web prototype on Figma phase 1	Sáng, Trí, Tiến
6	24/09/2021	Meeting review Latex report	All members

2 Task 1: Requirement elicitation

2.1 Task 1.1

2.1.1 Requirement

Question: Identify the context of this project. Who are relevant stakeholders? What are expected to be done? What are the scopes of the project?

2.1.2 Answer

The context of the project

- Restaurants are at greater danger than ever during the coronavirus outbreak.
- Require technologies that improve business intelligence, decrease wasted effort, and provide the ability to expand to a huge company.
- Such systems should provide for take-out options.

Therefore, Point of Sale (POS) offers a good choice for the demanding system. A point-of-sale (POS) transaction is what takes place between a merchant and a customer when a product or service is purchased, commonly using a point of sale system to complete the transaction.

Relevant stakeholders

1. Project manager.
2. Team members.
3. Managers.
4. Resource managers.
5. Executives.
6. Senior manager.
7. Company owners.
8. Investors.
9. Sponsors.
10. Financiers.
11. Clerks.
12. Consultants.
13. Customers.
14. End users.

Expectations

1. Requirement elicitation: Identify the general requirements and draw its use-case diagram.
2. System modeling: Draw an activity diagram, sequence diagram and class diagram.
3. Architecture design: Describe an architectural approach used to implement the desired system and draw its diagram.
4. Implementation – Sprint 1 : Implement a Minimum Viable Product (MVP) based on the given menu screen.
5. Implementation – Sprint 2 : Implement the MVP for shown screens and demonstrate the whole project.
6. Web-based application.

Scopes

1. Features of project's website:
    - Friendly-user items menu.
    - Friendly-manager order and transaction management.
    - Manage Orders.
    - Manage User's Profile.
    - Notification Configure.
2. Purpose of Project:
    - Understand the use-case of a Restaurant Management Project, particularly use-case of POS system.
    - Implementing a real website with some basic features: payment, billing, food order,...
3. Resources Specification:
    - 5 CS members.
    - Some members has experienced on Mobile. application front and back end.
4. Zero demand:
    - Support with some basic functions: payment, billing, food order,...
    - Non-direct contact between Clerks and Customers.
    - QR code to browser instead of install app.
    - Usable from a mobile device, a tablet device or a normal computer/ laptop.
    - Extendable to use in multiple restaurants in the future.
    - Current transactions = 300 orders per day.
5. Outcome of this project:
    - Understand and implement the MVP for screen showing in Figure 2 and Figure 3.
    - Build a real mini website that follow the MVP for screen.

2.2 Task 1.2

2.2.1 Requirement

Question: Describe all functional and non-functional requirements of the desired system. Draw a use-case diagram for the whole system.

2.2.2 Answer

Functional and non-functional of the desired system

Functional:

- User:
  - The user can log in to the system by scanning QR codes.
  - The user can choose from a menu of options.
  - The user can modify their existing order by adding additional items.
  - The user has the option of removing individual items or all items from their current order.
  - The user can check the status of their current order.
  - The user can place an order.
  - The user can view payment information.
- Admin:
  - Admin can add/update/delete food items to/from the menu.
  - Admin can update the price for a given food item.
  - Admin can update additional information for a given food item (out of service,sale,. . .)
  - Admin can view transaction bills.
- System:
  - System could display the order process.
- Kitchen:
  - Kitchen can view a list of confirmed orders.
  - Kitchen can update the status of the dishes (ready or not).
- Clerk:
  - Clerk can confirm the order from the customer.
  - Clerk can view feedback from customers.
  - Clerk can update the status of the dishes (delivered or not).

Non-functional:

- The system should allow non-direct contact between Clerks and Customers.
- The system should be extendable to use in multiple restaurants in the future.
- The website should respond in less than 0.5 second.
- The system should operate normally from 7am to 9pm, 7days/week.
- The number of current transactions is about 300 orders per day.
- The maintenance fee for the system should be less than $300 a month.

Use-case diagram of the whole system

2.3 Task 1.3

2.3.1 Requirement

Question: Choose one specific feature, i.e. food ordering, table reservation, customer management. Draw its use-case diagram and describe the use-case using a table format.

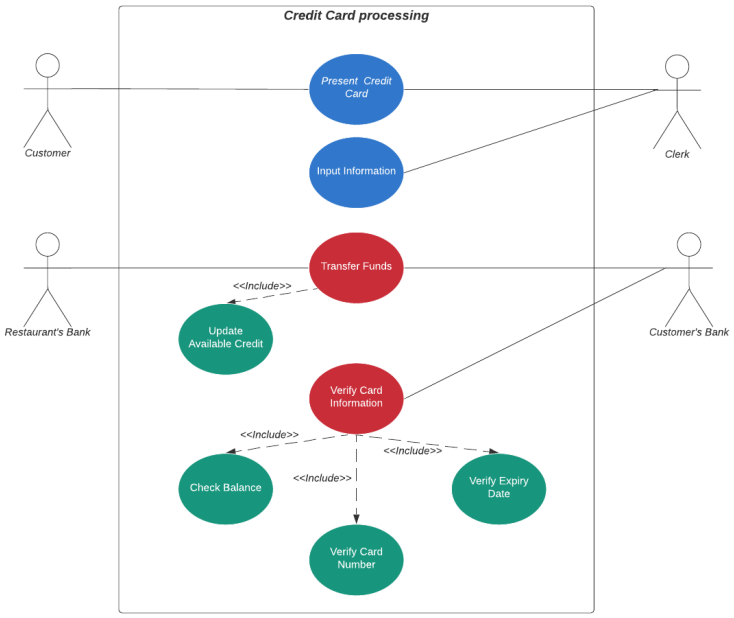
2.3.2 Answer

POS system consists of many features in order to give customers a best service without having direct contact, one of those is Credit Card Processing system. Most businesses rely on credit card processors to handle the details of accepting credit and debit cards. Credit card processing is a critical service—it ensures that customers can simply and quickly checkout.

How does credit card processing work?

First, customers will present their credit card information for payment. In store, consumers swipe cards on payment terminal. Online, consumers present credit and debit cards through websites and apps via many payment gateways.
The payment information is next sent to the processor, who communicates with the customer's bank via the appropriate card networks (such as Visa or Mastercard). The customer's bank approves or denies the transaction. Approval is dependent on detailed verification including card number validity, sufficient available funds, and other factors.
That approval is sent back through to merchant's payment processor and then finally back to the terminal or credit card reader. Approved transactions are batched for settlement typically at the end of each business day. The customers' accounts are charged for the transactions, with deposits then made into the merchant bank account.

Credit Card Processing Use Case



Describe Use Case in Table format

Credit card processing feature is quite complicated due the involvement of many actors, the tables below will give valuable insights into it.

Name	**Input Information**
Actor	Clerk
Description	The clerk uses the payment terminal to setup the payment processor, input the amount of credit that should be paid, the Account number of Restaurant's Bank
Pre-condition	The customers have already placed an order of dishes
Normal flow	1. Clerk sends the information to payment terminal

Name	**Present Credit Card**
Actor	Customer, Clerk
Description	The customers will have to present the Credit card to the clerk for the credit card payment process if in restaurant, enter the information about the card if online
Pre-condition	The clerk has already submitted the information of the restaurant's bank and bill to the payment terminal
Normal flow	1. Clerk sends the information to payment terminal 2. Present the Credit card 3. Enter the PIN code

Name	**Verify Card Information**
Actor	Customer's Bank
Description	The payment processor gets the credit card information that has been embedded inside the card together with the PIN code, sends it to the terminal then customer's bank to process, the bank checks the information if correct then approves the payment else denies the payment
Pre-condition	Customers must insert a PIN code so that the payment terminal has enough information to make a link to the bank
Normal flow	1. Clerk sends the information to payment terminal 2. Present the Credit card 3. Enter the PIN code 4. Verify card number, expiry date, available credit if it is satisfy to proceed payment
Exception	Exception 1: at step 3 3a. If the PIN code is not correct, the payment processor will ask the customers to re-enter the code maximum to three times.

Name	**Transfer Funds**
Actor	Customer's Bank, Restaurant's Bank
Description	Like an usual money transaction, the customer's bank updates the amount of credit available in customer's account and transfer an amount in the billing to the restaurant's account
Pre-condition	Card information has been checked fully and the customer's bank has approved the payment
Normal flow	1. Clerk sends the information to payment terminal 2. Present the Credit card 3. Enter the PIN code 4. Verify card number, expiry date, available credit if it is satisfy to proceed payment 5. Minus an amount in customer's credit and plus it to the restaurant's credit. Check the payment has been done. 6. Confirmation
Exception	Exception 2: at step 4 4a. If any of the information is not correct, the customer's bank will deny the payment and customers have to re-do from step 2