Informatics 2C Software Engineering

Coursework 1

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Description

The system allows customers to place orders and pay for them from their tables via touch screen displays and the restaurant to deliver these orders with the kitchen staff and waiters using a touch screen display and other input/output devices. It also allows the head chef to manage the restaurant menu and the restaurant manager to view order activity and change the table layout of the restaurant. Please refer to the document for further information.

3.1 Stakeholders

The various stakeholders in the system are: -

- The customers because they are directly affected by the functioning of the system and they want a system that can deliver the best service to them.
- The waiters because they want a system that helps them easily deliver their orders and do a good job.
- The kitchen staff and chefs because they want a system that supports them in preparing and managing orders conveniently.
- The head chef needs a good system to upload and update the menu and provide a great menu.
- The manager needs a system that enables him to view the order activity and change the table layout of the restaurant. This system thus supports any changes for improving the service offered.

3.2 Physical Architecture

The physical architecture consists of: -

- Input-Output devices
    - Touch-screen display at the tables.
    - Touch-screen display in the kitchen.
    - Office computer in the restaurant office.
- Input devices
    - Contactless payment system at the tables.
    - Push button by the kitchen pass.
- Output devices
    - Receipt printer at the tables.
    - Order ticket printer in the kitchen.
    - Order up light by the kitchen pass

3.3 Catalog Requirements

The functional requirements of the system (listed by stakeholders) are:

1. The Customer
    a. Shall be able to place an order using the system by
        i. Interacting with the menu and adding and removing food and drinks from the order.
        ii. Reviewing the current list of selected items.
        iii. Submitting the order using the submit button.
    b. Shall be able to make a payment to the system by
        i. Requesting the bill.
        ii. Paying by tapping a contactless smart card.
        iii. Requesting a receipt.

2. The Kitchen Staff
    a. Must be able to prepare orders through the system by
        i. Viewing the items ordered and their quantities.
        ii. Viewing the order of submission times of the orders.
    b. Should be able to indicate that an item is ready.
    c. Must have access to the printed order ticket to place with the order.

3. The Waiter
    a. Needs to be able to deliver an order by
        i. Knowing when an order is ready through the order up light.
        ii. Knowing which table the order is for.
        iii. Switching off the order up light when no further orders are ready.

4. The Head Chef
    a. Should be able to edit the food and drinks menu

5. Restaurant Manager
    a. Must be able to view a summary of order activity over a given time period.
    b. Must be able to change the restaurant table layout in the system according to real time modifications.

Non-functional requirements are:

1. The system must be efficient and be able to display orders to the kitchen staff fast and timely, and not mix orders. The order up light must function in time as well.

2. The system should be reusable to easily cope with updates so that crashes in any of the input, output, input-output devices of the system can easily be fixed.

Further notes:

1. There are no specifications for how the customers can request for services other than ordering food and drinks at the restaurant.
2. There is no requirement specification for how the restaurant layout is managed, and therefore this has been included under the requirements of the restaurant manager.
3. We are also assuming here that the order ticket contains all the details of the order including the table number.

3.4 Use Cases

The various use cases in the system are

1. Use case 1

    a) **Use case name**: Placing the order.
    b) **Primary actor:** The primary actor is a customer who places an order for food and drinks.
    c) **Supplementary actor:** The supplementary actor is the touch screen display at the table.
    d) **Summary:** The customer places an order for food using the touch screen interface.
    e) **Precondition:** The touch screen is working.
    f) **Trigger:** A customer adds an item to the order.
    g) **Guarantee:** The customers are successfully able to place an order for the quantity of food and drink they want.
    h) Main Success Scenario:
        1. All the customers select the quantity of food and drinks that they want to order.
        2. One of the customers presses the ‘order submit’ button

    i) Requirements exercised: Requirement 1.a

2. Use case 2 - Preparing the order.

The primary actor in this use case is the **chef** that prepares the order. The touch screen display is the supplementary actor. The screen presents the chef with the orders of the items and their quantities, which are listed in order of submission time. The chef then prepares the order.
The requirement exercised by this use case is **requirement 2.a.**

3. Use case 3

a) **Use case name:** Managing the order.
b) **Primary actor:** The primary actor is a chef who manages an order.
c) **Supplementary actor:** The supplementary actors are the system that prints the order ticket, the display on which an item is indicated as ready and the order up light.
d) **Summary:** The chef manages the prepared orders in the pass area appropriately.
e) **Precondition:**
f) **Trigger:** A specific item of an order is ready.
g) **Guarantee:** All items of an order are managed appropriately.
h) **Main Success Scenario:**
    1. The chef places the first item of the order in the pass area.
    2. The chef indicates that the item is ready on the touch screen display.
    3. The system prints an order ticket that is placed along with this item in the pass area.
    4. The chef places other subsequent items of the order in the pass area, indicating each time on the display that an item is ready.
    5. The order is complete and the order up light is lit.

i) Requirements exercised: Requirement 2.b and 2.c

4. Use case 4

a) **Use case name:** Delivering the order
b) **Primary actor:** The primary actor is the waiter that delivers the order.
c) **Supplementary actor:** The supplementary actors are the order up light and the push button
d) **Summary:** The waiter delivers the food and drink to the customers.
e) **Precondition:**
f) **Trigger:** The order up light is lit
g) **Guarantee:** The customers are delivered their ordered quantities of food and drink
h) **Main Success Scenario:**
    1. The waiter sees that the order up light is lit, and goes to collect the order.
    2. The waiter switches off the light by pressing the push button if no other orders are ready.
    3. The waiter delivers the order to the specific table.

i) Requirements exercised: Requirement 3

5. Use case 5 - Making the payment

The primary actor is the customer. The supplementary actor is the touch screen display which has the mini printer. The customers request the bill using the touch screen display, and the full order and amount due is displayed. One of the customers taps his contactless smart card against the display, which authorises payment by connecting to some bank server over the internet. The customer can request for a receipt and the mini printer in the display unit prints it out. The requirement addressed here is **requirement 1.b.**

6. Use case 6 - Updating the menu

The primary actor is the head chef. The head chef updates the food and drinks menu using the office computer. The requirement exercised here is **requirement 4.**

7. Use case 7 - Viewing order activity.

The primary actor is the restaurant manager. The manager can use the office computer to view a summary of the orders over the past week, day or other specific periods. The requirement addressed here is **requirement 5.a.**

8. Use case 8 - Changing table layout

The primary actor is the restaurant manager, who can change the restaurant table layout by adding or removing tables through the system. The requirement exercised here is **requirement 5.b.**

UML Case Diagram