

Milwaukee School of Engineering
Electrical Engineering and Computer Science Department

SE-382 – Final Examination

Thursday 26 February 2004

Open books and notes. No sharing of materials.

Show all work so that partial credit can be given.

Name: _____

(Choose 6 of 8 problems – Cross out 2 problems here)

Problem 1: (16 points) _____

Problem 2: (16 points) _____

Problem 3: (16 points) _____

Problem 4: (16 points) _____

Problem 5: (16 points) _____

Problem 6: (16 points) _____

Problem 7: (16 points) _____

Problem 8: (16 points) _____

Objective Survey: (4 points) _____

Total: (100 points) _____

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**Reference for Problems 1 Through 4:
Restaurant carryout and delivery order processing system**

Product purpose: The product shall enable restaurant customers to efficiently and conveniently place carryout and delivery orders.

Goals:

- Provide faster customer service
- Reduce work for restaurant counter personnel
- Increase order fulfillment accuracy

The client: The product is being built for a restaurateur who owns 25 restaurants covering a 2-state region.

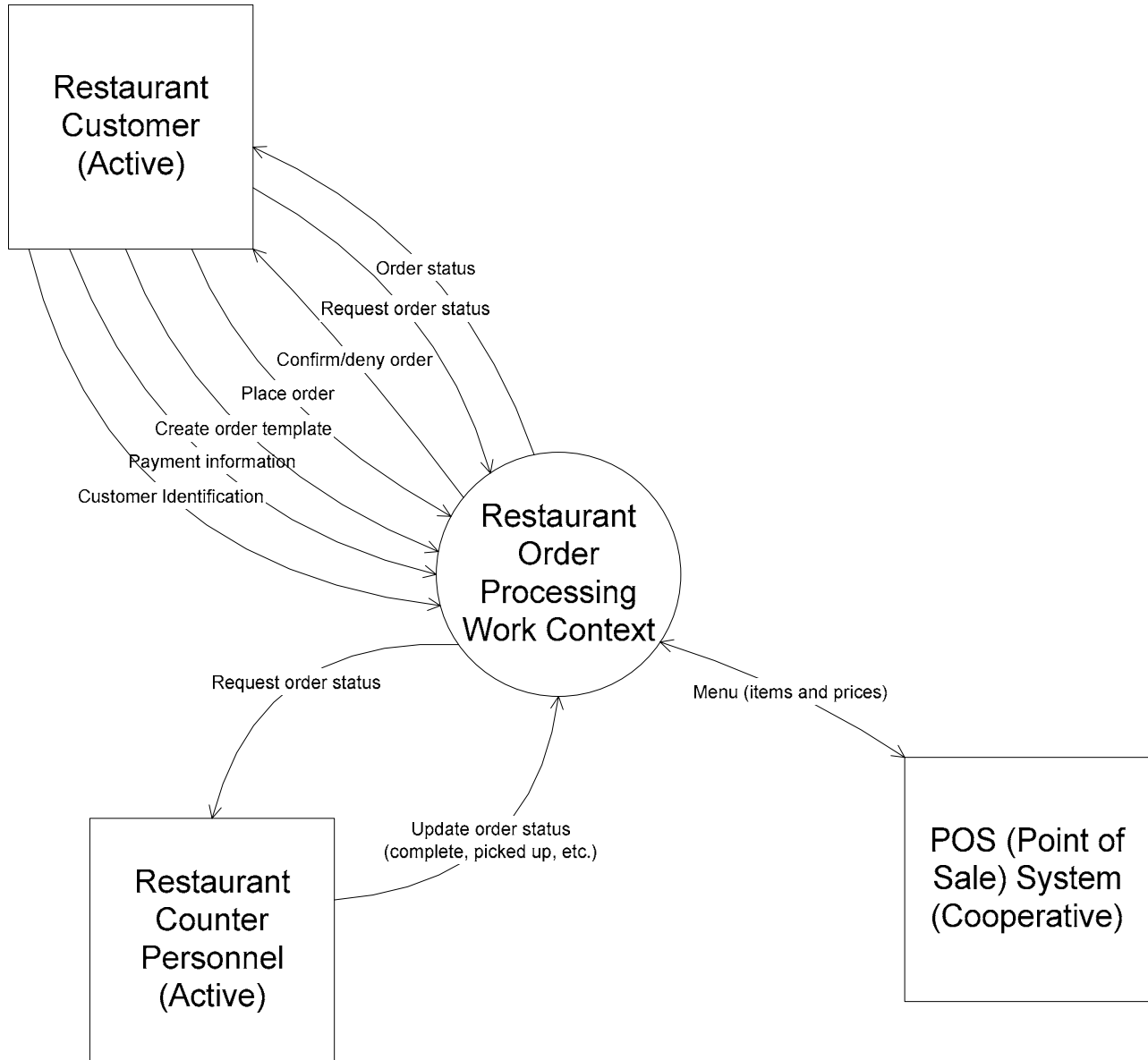
The customer: Same as the client for now. Non-exclusive licensing has been negotiated with the client so that the product may later be commercialized.

The stakeholders: Restaurant customers (of varying ages, technical savvy, and physical abilities), the client, restaurant employees who must use the system, contracted technical support personnel.

The users: Customers of the restaurant, technical support and regular maintenance personnel, restaurant employees (chefs and counter personnel).

Constraints: The medium or media have not yet been determined; a touch-tone telephone system and/or a web-based application are currently envisioned.

Review the following system context diagram before answering questions 1 through 4. In addition to selecting individual items to create an order, the system will allow the user to set up a list of standard order “templates” for easy access on future visits.



1. State Transition Diagram

Enumerate the states of an order that are needed to support the functionality described above.

Draw a state transition diagram, being sure to include all of the states you listed and being sure to support order templates.

2. ER Diagram

Draw an ER diagram showing the relationship between and key items of customers, their orders, and menu items. The diagram should include cardinality information (*i.e.*, in how many relationships does an entity participate) and include fields necessary to support the above functionality.

3. Non-events

Identify 2 nonevents using the context diagram and/or the description of the problem. Describe how the system might effectively handle these nonevents.

4. *CRUD Check*

(This question will be easier if you have completed question 1, but that is not required.) Perform a CRUD check for the “order” object given the problem description and your work on 1–3 of the above problems.

5. Fit Criterion

(a) (6 points) “The Fit Criteria is not a test, but a goal that the tester uses to determine if the solution meets the requirement”. Do you agree with this statement? Justify your answer with examples.

(b) (10 points) Write the Fit criteria for any 5 of the following requirements.

1. The product shall be easily used by a member of the public who may not speak English.
2. Ticket stock must be replaceable without interruption to service.
3. The product shall calculate the number of software downloads that were performed in a day.
4. The product shall keep its money safely.
5. The product will be used in windy station forecourts
6. The product shall detect erroneous signals.
7. The product shall produce a log of all erroneous or cancelled transactions.

6. Prototyping

A prototype is a great way to elicit user - interface requirements. When presented with the two alternatives to enter date and time, the user can easily identify the one that closely meet their needs.

January 2004

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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

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Year: ____

Month: ____

Day: ____

Does prototyping play any other role in Requirements elicitation and analysis? Justify your answer.

7. Use Cases

Given the following use case, please come up with at least 5 functional and 3 non-functional requirements.

Use Case Name: Customer Information

Brief Description

This use case describes how a customer record can be created or edited. The actor in this case is the owner of the home furnishing company.

Flow of Events

Basic Flow

- The user signifies that he or she wishes to add a customer to the system.
- The system provides the opportunity to enter the required customer information
 - Name of the customer representative.
 - Billing and mailing address of the customer.
 - Telephone number of the customer.
 - Amount of the discount given to the customer.
 - The company that the customer is representing.
- The user requests that the customer data be saved.
- The system verifies the format of each piece of information that the user provided.
- The system checks to make sure the customer is not already in the system.
- If the information is in the correct format and the customer is not already in the system, the customer is added to the system.

Alternative Flows

Customer information is in an incorrect format

- If any customer details are provided incorrectly, the system will respond by informing the user of what detail(s) was/were entered incorrectly and ask the user to re-provide the details in the correct format. The incorrect format for the customer name is a number instead of a name. The incorrect format for a telephone number would be characters instead of numbers or more than or less than ten numbers.
- After the correct details are provided, the system will then continue on with the basic flow.

The customer already exists in the system

- The system will inform the user that the customer already is in the system.
- The system will provide the user with a choice of viewing/editing the existing customer information.

2.2.2.1 The customer chooses not to view/edit the existing customer

- The user is redirected back to the user starting point.

2.2.2.2 The customer chooses to view/edit the existing customer

- The system allows the user to view/edit the customer information.
- The user requests that the customer data be updated.
- The system verifies the format of each piece of information that the user provided.
- The user is redirected back to the user starting point.

Canceling Customer Addition

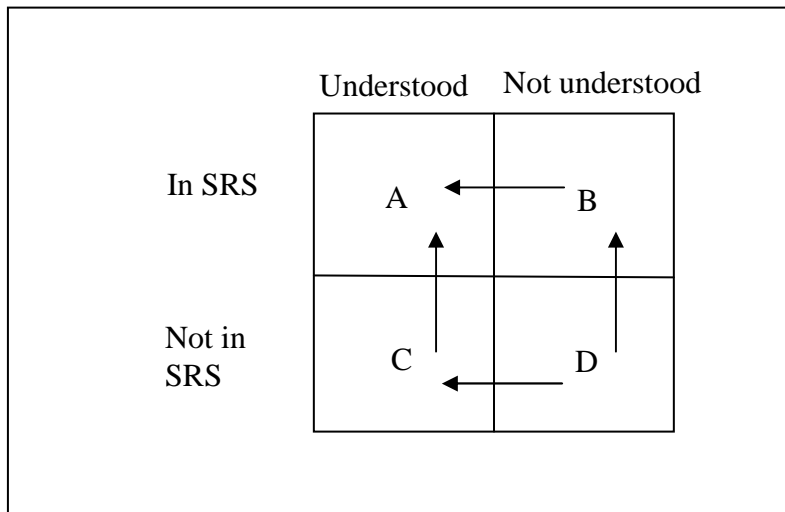
- The user chooses not to save the customer information.
- The user is redirected back to the user starting point.

[extra space for problem 7 work]

8. Requirements Specification

In the “Local Requirements Completeness Model” drawn below, what steps would you take to

- (a) Move a requirement from Quadrant B to Quadrant A?
- (b) Move a requirement from Quadrant C to Quadrant A?
- (c) Move a requirement from Quadrant D to either Quadrant B or C?



[extra space for work]