

Object-oriented Design

Part 1: Before the Requirement Change

Part 2: After the Requirement Change

1. Transform the analysis use case documentation of use case “Purchase” to design use case documentation.

Remarks: All action verb phrases

After the requirement change

Design Use Case

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Use Case Name:	Purchase	
Actor(s):	Member, Shop Assistant	
Description:	This use case describes the process of purchasing some goods	
Reference:	JMS-2	
Typical Course of Events:	Actor Action	System Response
	<p>The main window is currently displayed with a button [Purchase].</p> <p>Step 1: Initiate the use case when a member wants to purchase goods and the assistant clicks [Purchase].</p> <p>Step 3: If the member chooses to wave the card, then the assistant clicks [Wave Card] button.</p>	<p>Step 2: The system displays a dialog window asking the customer to wave card at the sensor or input the membership number manually.</p> <p>Step 4: The system shows a message on the screen “Waiting</p>

	<p>Step 5: The member waves the card at the sensor.</p> <p>Step 7: The member inputs the correct password.</p> <p>Step 9: The member waves the goods one by one at the sensor.</p> <p>Step 11: The assistant clicks the “OK” button.</p> <p>Step 13: The assistant clicks [OK].</p>	<p>for waving card!”</p> <p>Step 6: The system displays one dialog window asking for the password to be entered.</p> <p>Step 8: The system displays a dialog window to tell the member that the password is correct, and please wave your goods.</p> <p>Step 10: The system displays the purchased goods in the new purchase dialog window one by one.</p> <p>Step 12: The system displays a dialog window showing the following information: membership number, date, time, items purchased and total amount.</p> <p>Step 14: The system records the</p>
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	<p>purchase information and shows a successful message on the window to conclude the use case.</p> <p>Step 15: The assistant clicks the button [SMS].</p> <p>Step 16: The system generator generates a message including the purchase information (date, time and total amount) by invoking another use case “Generate Purchase Information”. Then the generator sends a SMS including the above information to the member’s mobile phone.</p> <p>Step 17: This use case concludes when the system displays a message “ Send Successfully”. The system will go back to the main window after the assistant clicks [Go Back] button.</p>
Additional Courses	<p>Step 3: If the customer chooses to input the card number manually, then the system would show another dialog window to request the member to enter the membership number. If the inputting membership number is wrong, the system will show a message “ The number is wrong, please input again!” After showing this message 3 times, if the member still can not input correct membership number, the system will show a dialog window asking the member to input personal information like telephone number, email address, or name. The customer could input any choices of it. If the information is correct, the system will search the database to find out the membership number and</p>

	<p>show the membership number on the screen. If the inputting card number is correct, then go to STEP 6.</p> <p>Step 7: If the inputting password wrong, then the system would show a message “Password is wrong, please enter again!” and ask for the password again. Also, after 3 times, if the password is still wrong, the transaction will be stopped. The system will show a message “Please purchase without membership card” or go to another use case “Find Correct Password”.</p> <p>Step 17: If the message is sent unsuccessfully, the assistant could click [Send Again] button to send the message one more time. If the message could not be sent successfully within 5 times, the system will show another message “Please try again in 5 minutes!” and record the message to be sent.</p>
Precondition:	<p>The member registered as a member.</p> <p>The main page is showed on the screen.</p>
Post-condition:	<p>Purchase record is recorded in the system and showed on the screen.</p> <p>The member receives the message of purchase information from the system.</p>
Assumptions:	None.

2. Model object interaction and behaviors for the Design Use Case

“Purchase”.

1) Identify and categorize design classes;

BOUNDARY CALSSES	CONTRAL CALSSES	ENTITY CLASSES
Main Window	Purchase Processor	Purchase Record
Inputting Style Window	Validation Processor	Member
Message Window		Purchase Information
Password Window		
Goods Window		
Purchase Window		

Records Window		
Customer dialog window		
Membership number window		
SMS Window		

2) Identify (additional) attributes;

No additional attributes discovered.

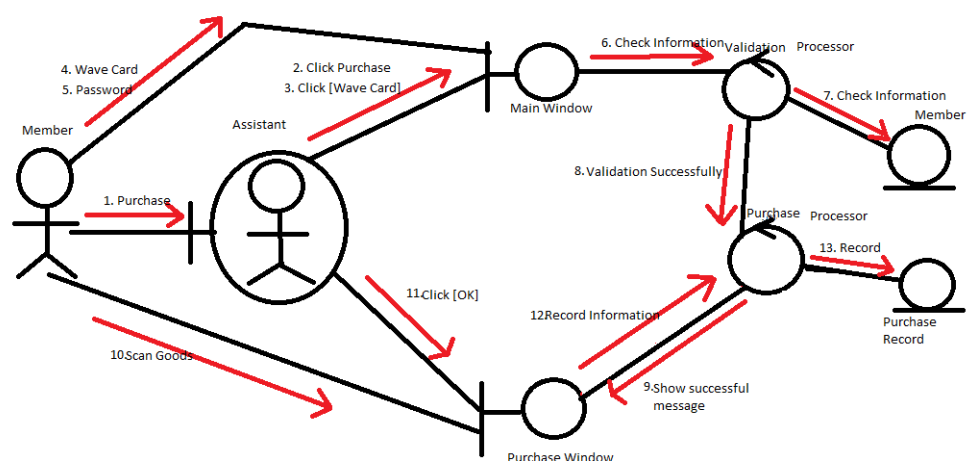
3) Identify behaviors and responsibilities.

BEHAVIOUR	AUTOMATED/MANUAL	CLASS TYPE
Show waiting message	AUTOMATED	Boundary
Display Dialog Window	AUTOMATED	Boundary
Display correct message	AUTOMATED	Boundary
Display Goods window	AUTOMATED	Boundary
Show wrong message	AUTOMATED	Boundary
Display password window	AUTOMATED	Boundary
Display Records Window	AUTOMATED	Boundary
Show Inputting Membership Number Window	AUTOMATED	Boundary
Show Information Window	AUTOMATED	Boundary
Show Membership Number Window	AUTOMATED	Boundary
Search Database	AUTOMATED	Control
Record the purchase information	AUTOMATED	Entity
Display a message	AUTOMATED	Boundary
Generate a message	AUTOMATED	Control
Send a message	AUTOMATED	Control

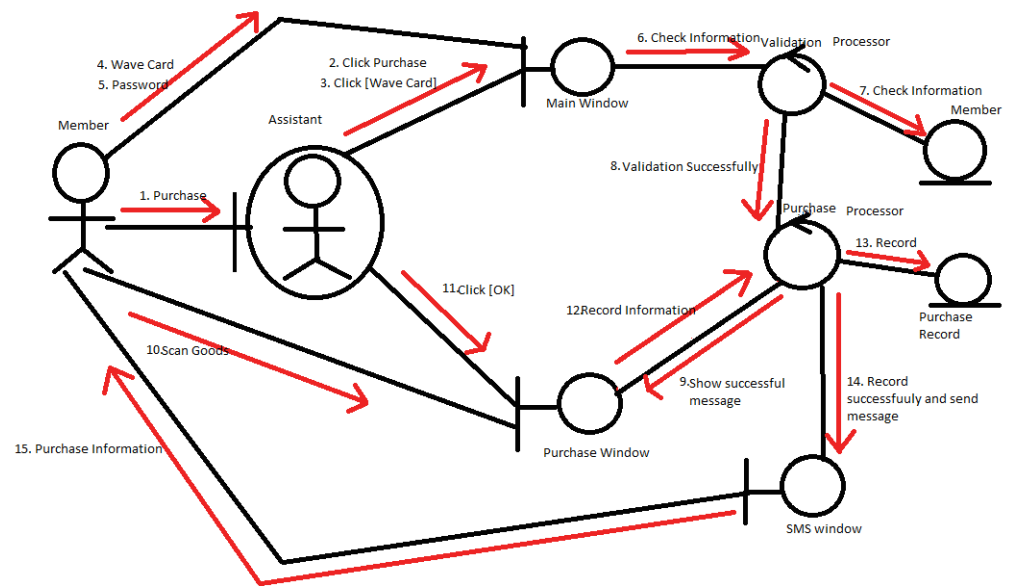
Show failure message	AUTOMATED	Boundary
Record message	AUTOMATED	Entity
Go back to the main window	AUTOMATED	Control
Invoke another use case	AUTOMATED	Control
Show another message	AUTOMATED	Boundary
Click [Wave Card]	MANUAL	
Wave card	MANUAL	
Click [Purchase]	MANUAL	
Input password	MANUAL	
Click [OK]	MANUAL	
Click [Member]	MANUAL	
Wave Goods	MANUAL	
Click [SMS]	MANUAL	
Click [Go Back]	MANUAL	
Click [Send again]	MANUAL	

3. Sketch high-level object interactions with communication diagram for the Design Use Cases “Purchase”.

Before the requirement change:

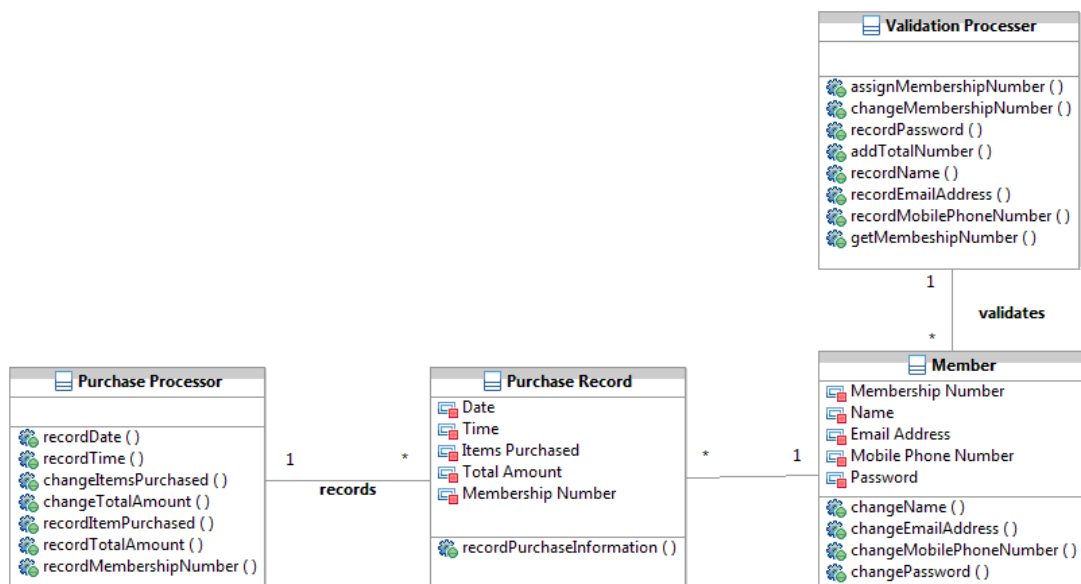


After the requirement change:



4. Update the class diagram from the one appeared in Assignment 1 sample solution so that it ONLY reflects (i) the changes of object classes relevant to the Design Use Case “Purchase”, and (ii) design class identified above in Step 2.

Before Requirements change:



After Requirement Change:

