



# 8 Steps to Effective Use Cases – Better User Level Requirements

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# 8 Steps to Effective Use Cases

**Use cases identify how the system will be used.**

1. Define the system boundaries
2. Identify the actors
3. Determine interactions
4. Establish pre & post conditions
5. Document the main success scenario
6. Branch to alternatives & exceptions
7. Merge or create sub-use cases as appropriate
8. Record additional information

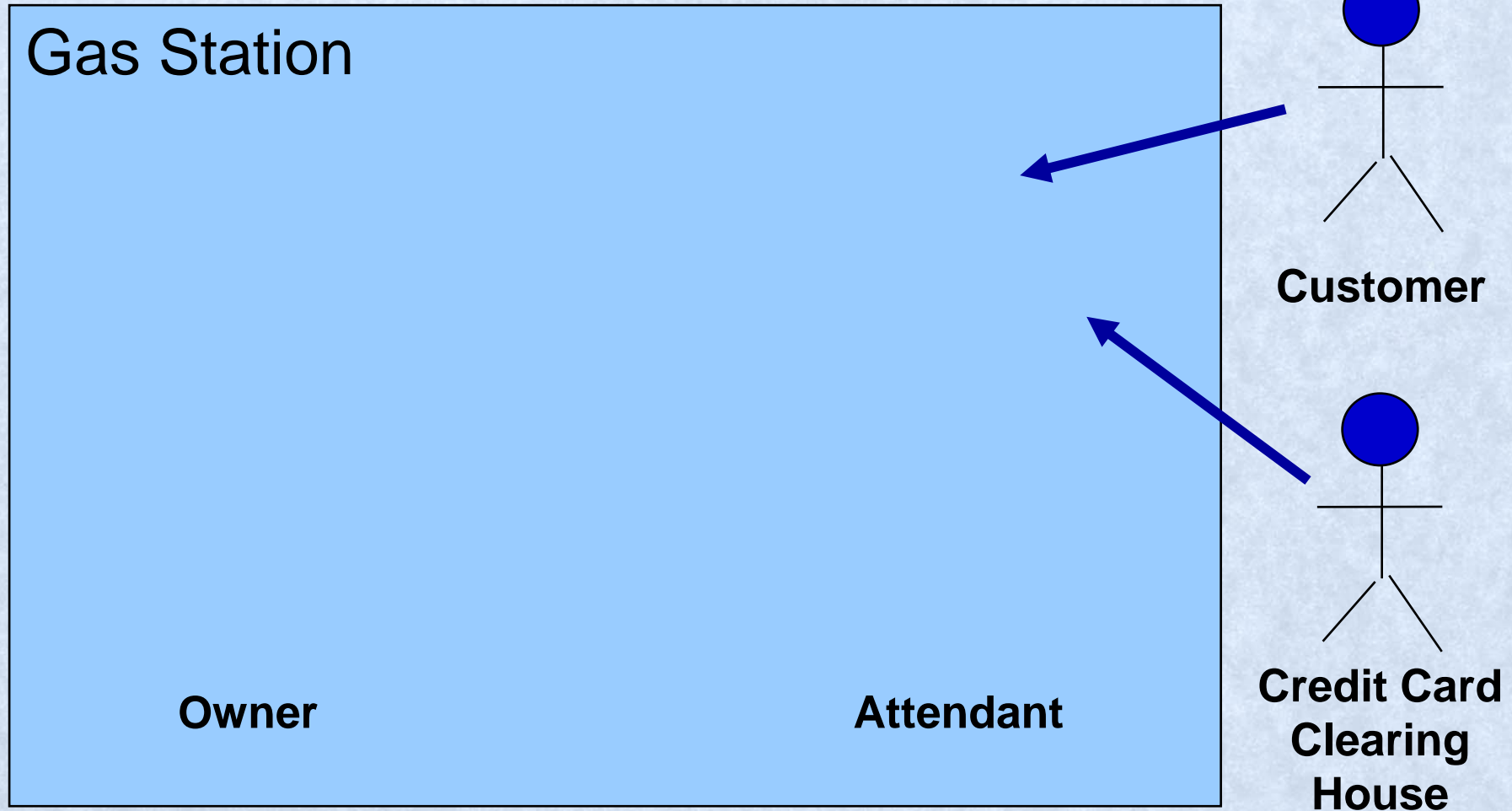
# Step 1 – Define the System Boundaries

Gas Station



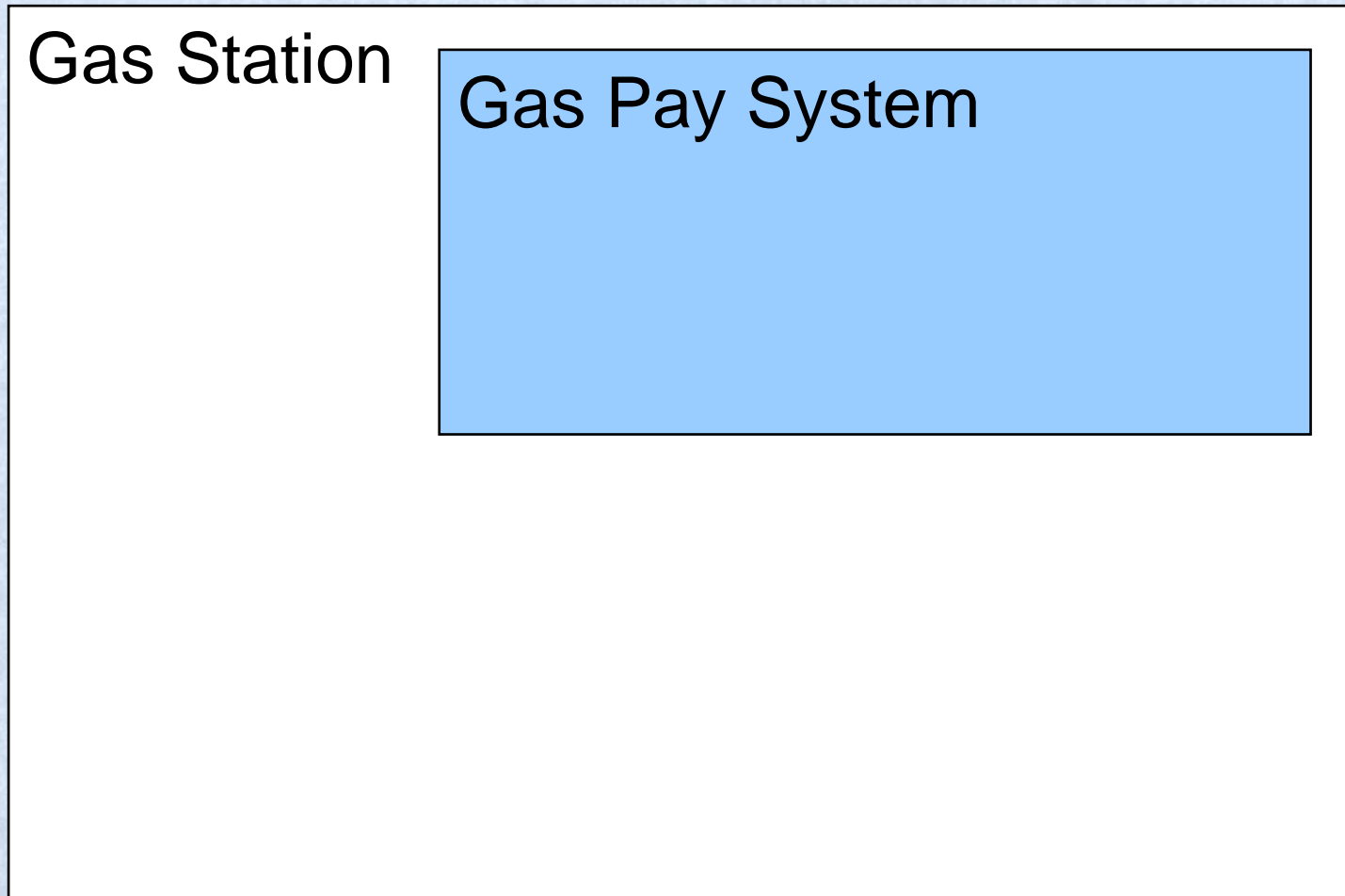
**System Under Consideration = Gas Station**

# Step 2 – Identify the Actors



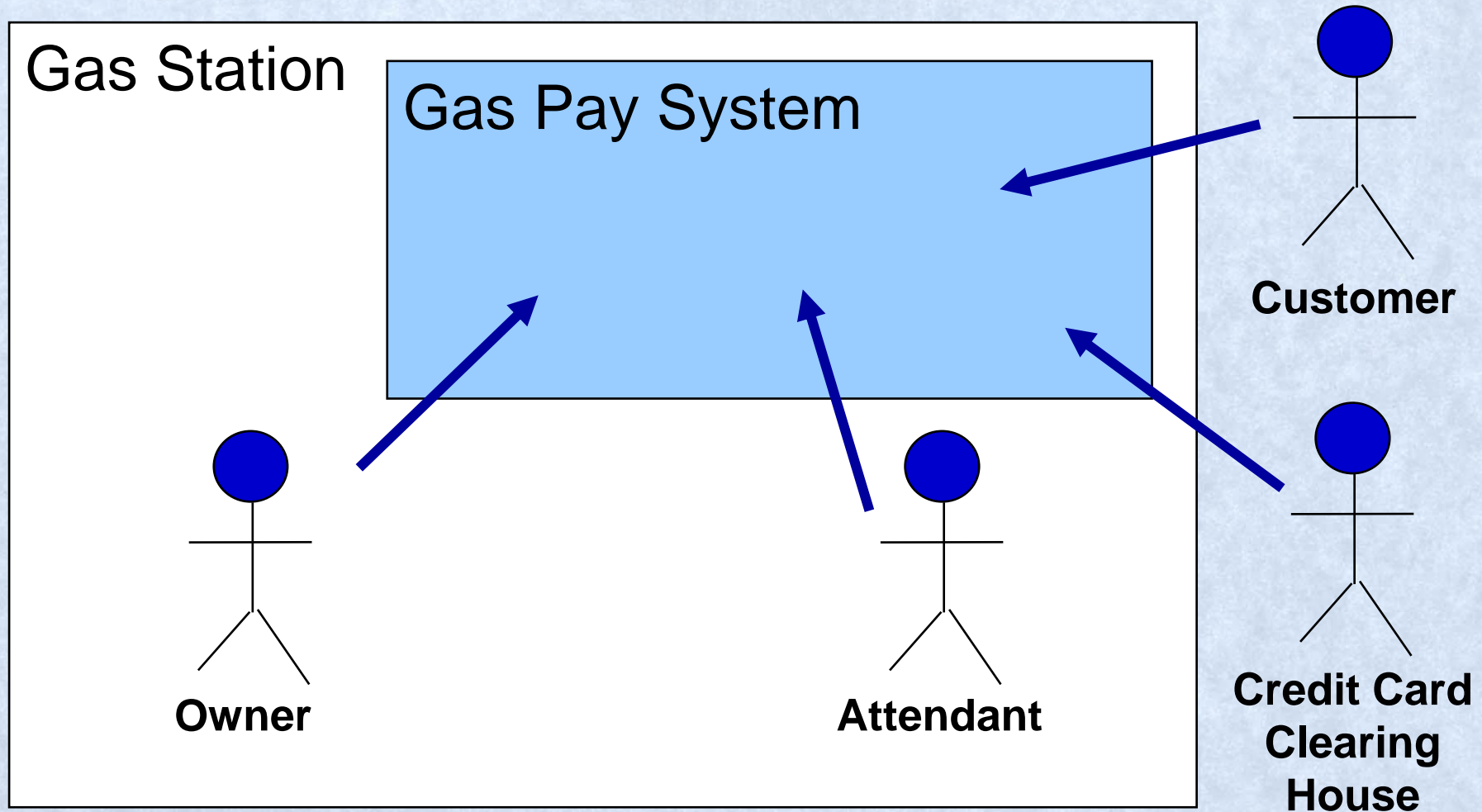
**System Under Consideration = Gas Station**

# Another Perspective – System Boundaries



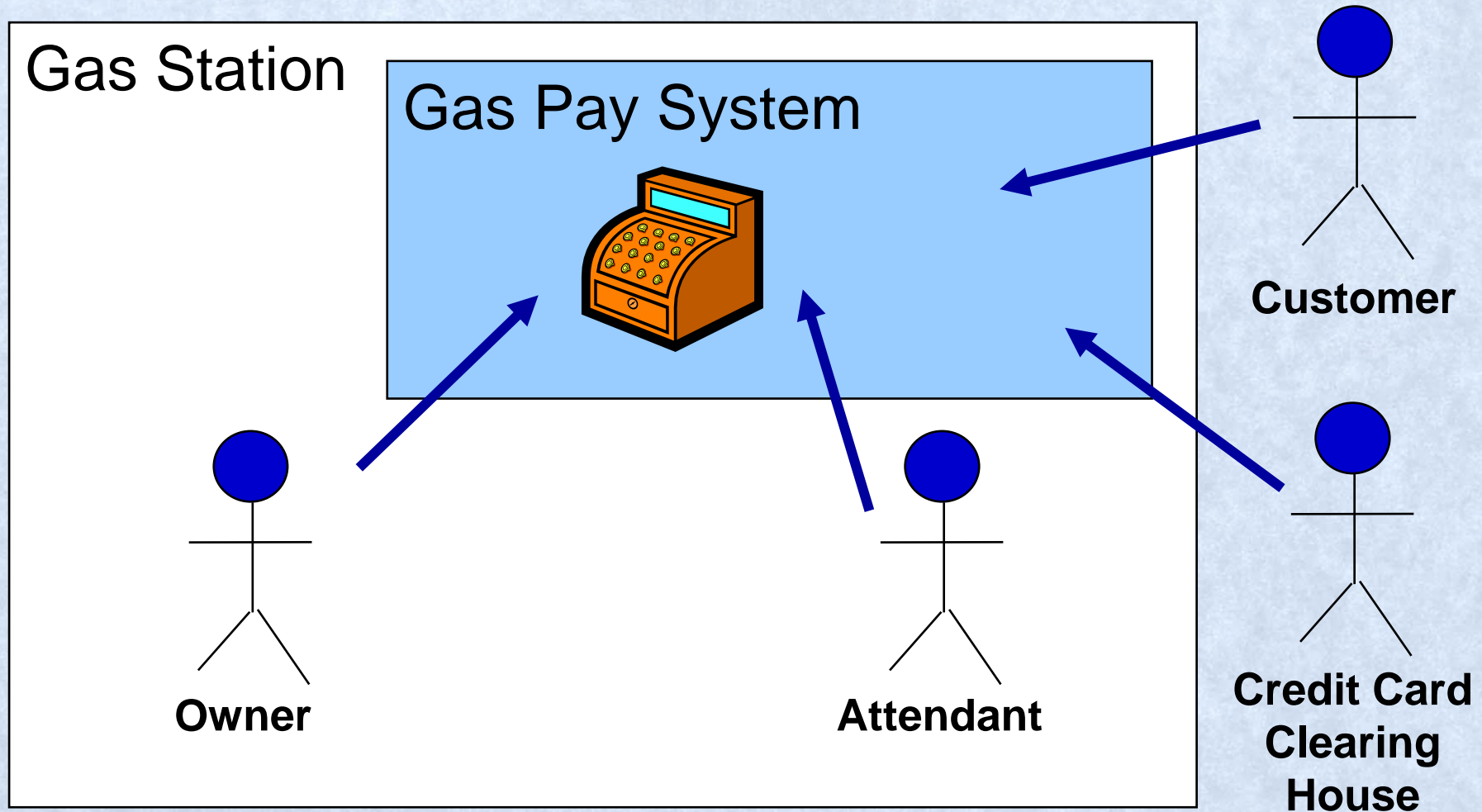
**System Under Consideration = Gas Pay System**

# Another Perspective – Identify Actors



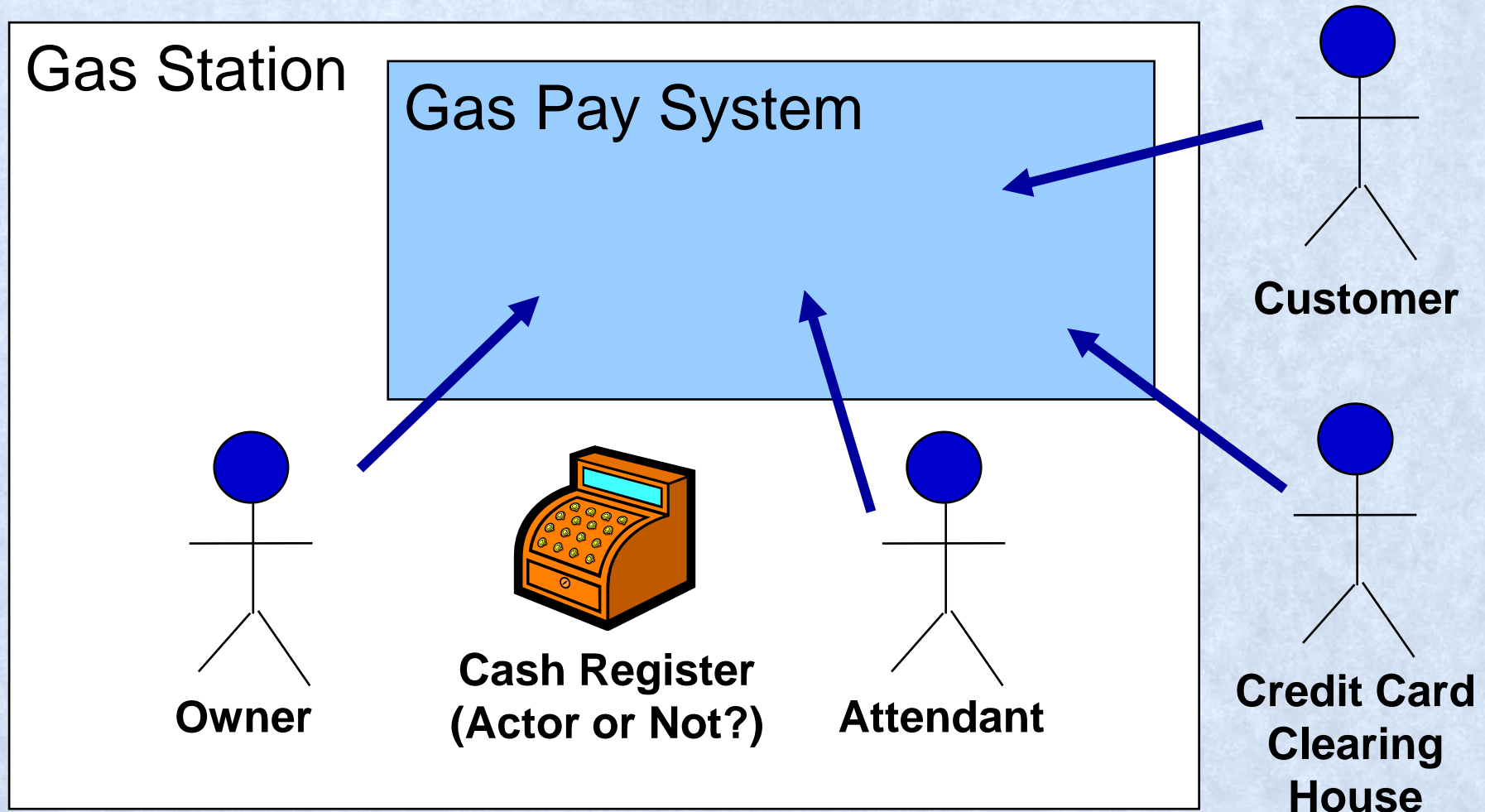
**System Under Consideration = Gas Pay System**

# Where is the Cash Register?



**System Under Consideration = Gas Pay System**

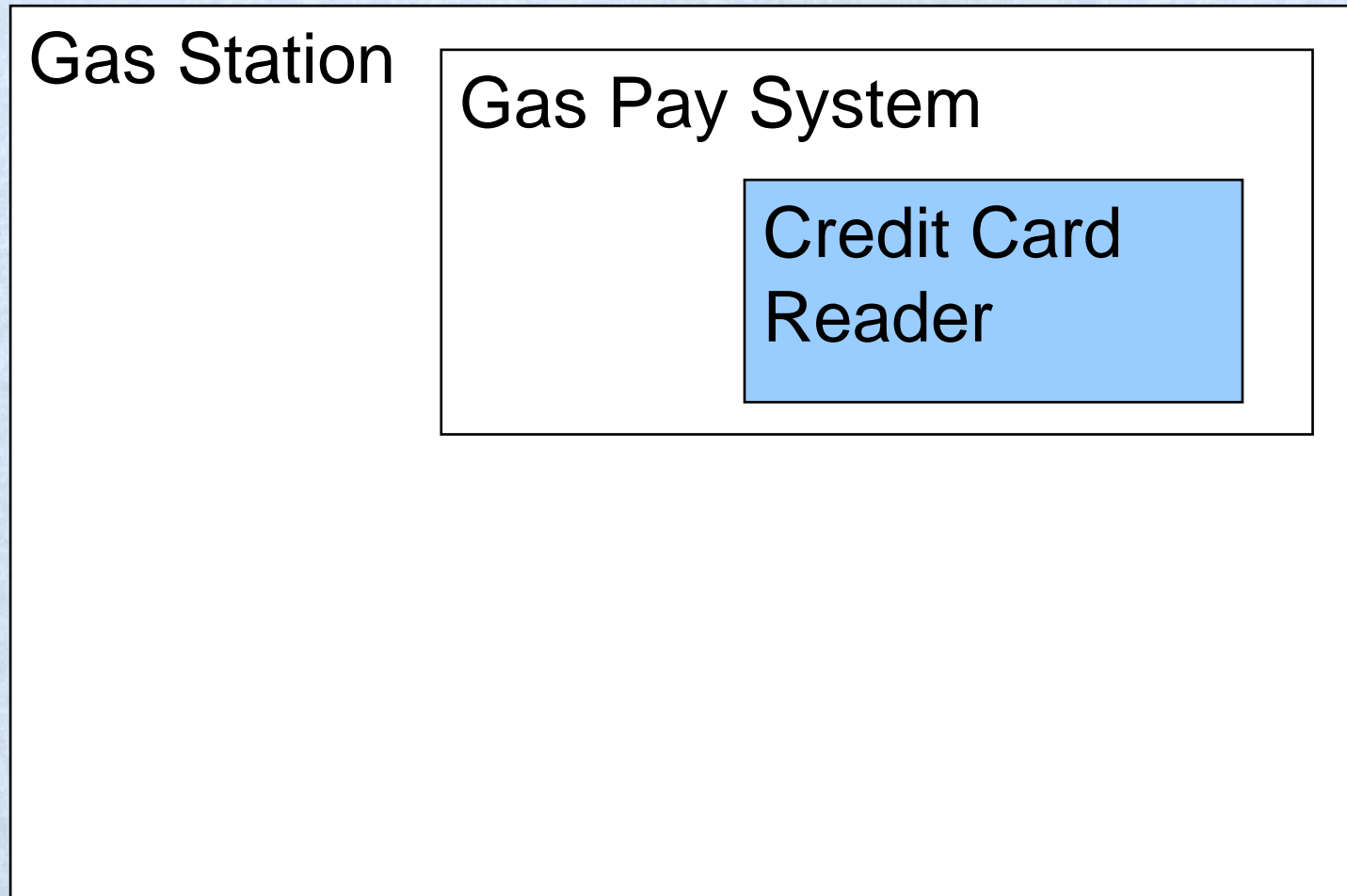
# Where is the Cash Register? (cont.)



**System Under Consideration = Gas Pay System**

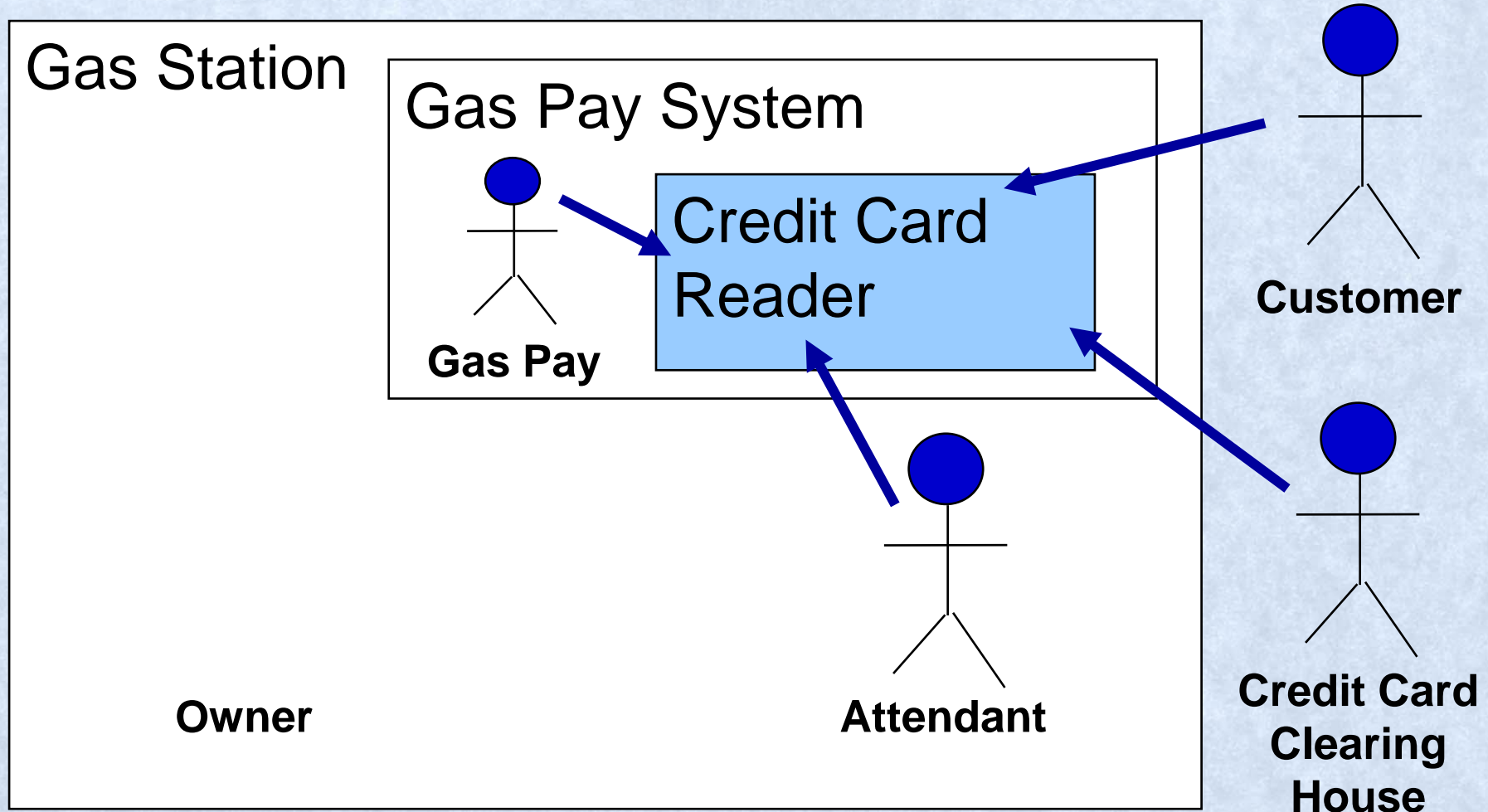


# Yet Another Perspective – System Boundaries



**System Under Consideration = Credit Card Reader**

# Yet Another Perspective – Identify Actors



**System Under Consideration = Credit Card Reader**

# Step 3 – Determine Interactions

## For each identified actor, determine:

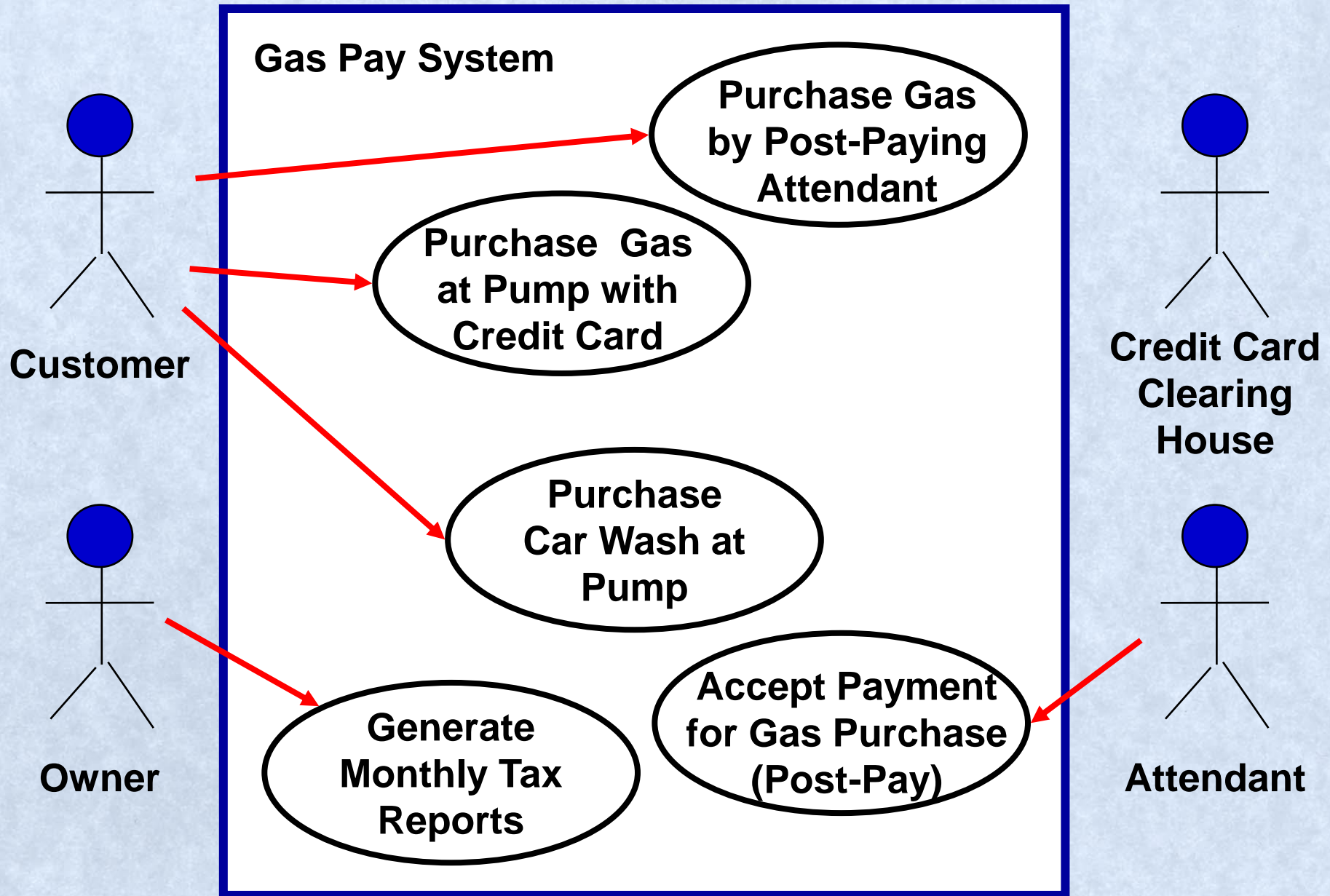
- Main tasks or functions performed using the system
- Data acquired, produced, or changed in the system
- Information given to or wanted from the system
- Notifications or alarms wanted from the system

## Primary actor:

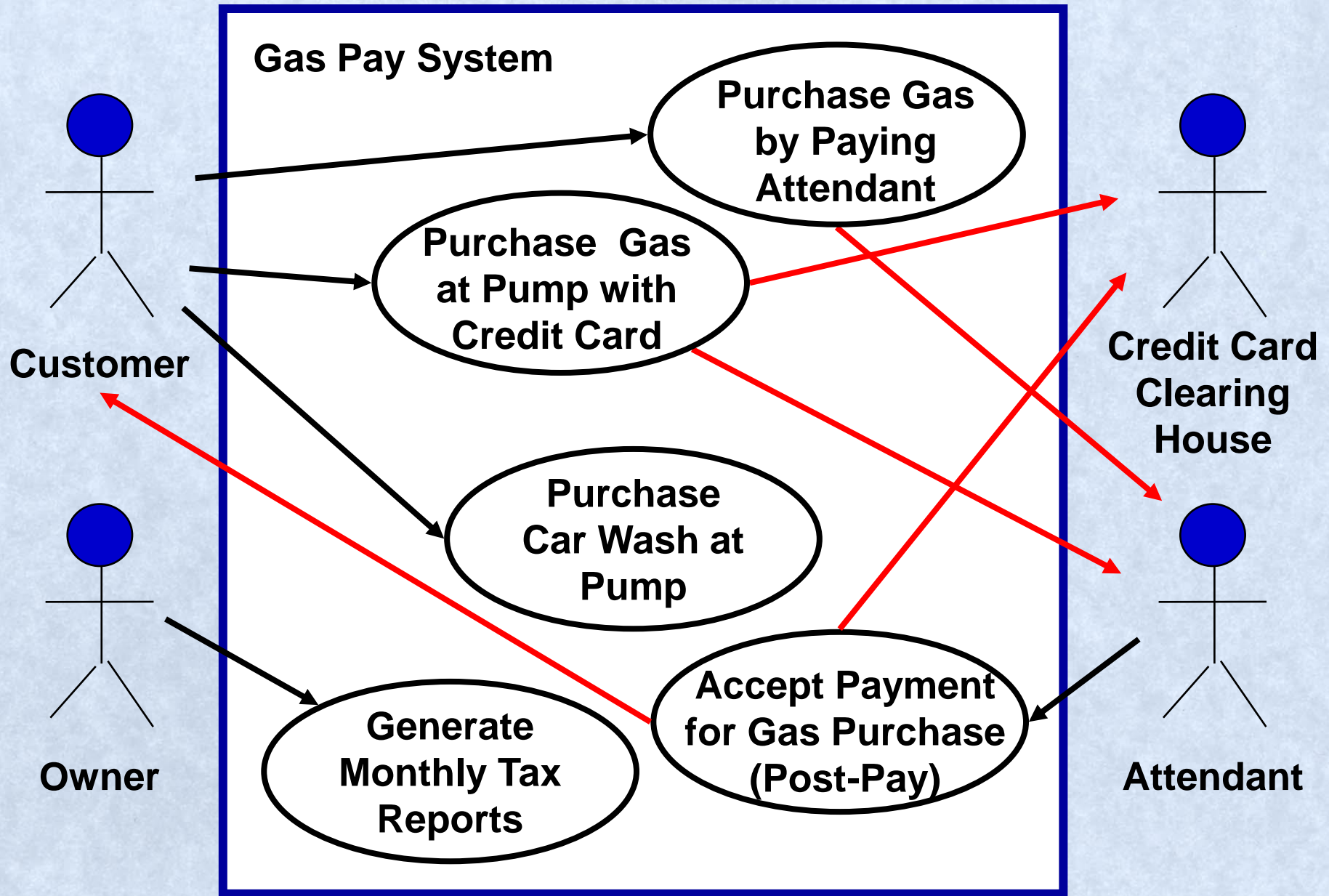
- Initiates the use case
- The use case is initiated for that actor

**Secondary actor:** Other actor(s) involved in the use case

# Use Case Diagrams – Primary Actor



# Use Case Diagram – Secondary Actor



# Step 4 – Establish Pre & Post Conditions

## For each use case establish its:

- Pre conditions (entry criteria): What must be true before the use case can start?
- Post conditions (exit criteria): What must be true before the use case is successfully completed?

## Purchase gas at pump with credit card - example:

### ● Pre conditions

- 
- 
- 

### ● Post conditions

- 
- 
-

# Use Case – Example

**Use Case:** Accept Payment for Gas (Post-Pay)

**Primary Actor:** Attendant

**Secondary Actors:** Customer, Bank Consortium

**Preconditions:**

- Gas has been successfully pumped
- Customer has arrived at Attendant to pay for gas

**Post Conditions:**

- Payment has been received
- Customer was able to pay for gas with payment type of preference
- Customer received receipt

# Step 5 – Document Main Success Scenario

## Main Success Scenario:

1. Attendant acknowledges next customer
2. Customer pays for the gas they pumped
3. Attendant gives customer change & receipt



# Main Success Scenario – Detailed Example

## Main Success Scenario:

Actor Actions	System Responses
1. Attendant greets Customer & asks which pump	
2. Customer identifies pumps	
3. Attendant polls system for pump information	4. System reports gallons pumped & total price
5. Attendant confirms price with customer & acknowledges price with system	6. System accepts price & displays price on cash register display
7. Attendant ask if other items & Customer responds no	
8. Attendant asks for payment type & Customer pays in cash	
9. Attendant enters cash tendered into cash register	10. System calculates & displays change & prints receipt
11. Attendant provides change & receipt to customer	
12. Attendant ends transaction	13. System saves transaction information & resets pump

# Step 6 – Branch to Alternatives & Exceptions

## Alternative Scenarios:

Actor Actions	System Responses	
1. Attendant greets Customer & asks which pump		
2. Customer identifies pumps		
3. Attendant polls system for pump information	4. System reports gallons pumped & total price	
5. Attendant confirms price with customer & acknowledges price with system	Actor Actions	System Responses
7. Attendant ask if other items & responds no	5a1. Customer identified <b>wrong pump</b> & changes pump identification	5a3. System resets to no pump identified
8. Attendant asks for payment type & Customer pays in cash	5a2. Attendant cancels previous pump	
9. Attendant enters cash tendered into register	5a4. Return to step 3	
11. Attendant provides change & receipt to customer	10. System calculates & displays change & prints receipt	
12. Attendant ends transaction	13. System saves transaction information & resets pump	

# Other Alternative – Examples

## Alternative Scenarios:

Actor Actions	System Responses	
1. Attendant greets Customer & asks which pump 2. Customer identifies pumps 3. Attendant polls system for pump information 5. Attendant confirms price with customer & acknowledges price with system	4. System reports gallons pumped & total price 6. System accepts price & displays price on	
7. Attendant ask if other items & C responds no 8. Attendant asks for payment type Customer pays in cash 9. Attendant enters cash tendered register 11. Attendant provides change & re customer	<b>Actor Actions</b> 7a1. Customer <b>purchase another item</b> 7a2. Attendant enters price for additional item in cash register 7a4. Return to step 8	<b>System Responses</b> 7a3. System accepts price & displays item price & running total price on cash register
12. Attendant ends transaction	13. System saves transaction information & resets pump	

# Other Alternative – Examples (cont.)

## Alternative Scenarios:

Actor Actions	System Responses	
1. Attendant greets Customer & asks which pump		
2. Customer identifies pumps		
3. Attendant polls system for pump information	4.	System reports gallons pumped & total price
5. Attendant confirms price with customer & acknowledges price with system	6.	System accepts price & displays price on cash register display
7. Attendant ask if other items & Customer responds no		
8. Attendant asks for payment type Customer pays in cash	Actor Actions	System Responses
9. Attendant enters cash tendered into cash register	4a1.	<b>System can not communicate with pump</b>
11. Attendant provides change & customer	4a2.	Attendant manually checks pump display & enters amount into cash register
12. Attendant ends transaction	4a3.	Return to step 7
		resets pump

# Exception – Examples

## Exception Scenarios:

Actor Actions	System Responses							
1. Attendant greets Customer & asks which pump 2. Customer identifies pumps 3. Attendant polls system for pump information 5. Attendant confirms price with customer & acknowledges price with system 7. Attendant ask if other items & Customer responds no	<table border="1"> <thead> <tr> <th data-bbox="776 429 1395 497">Actor Actions</th> <th data-bbox="1395 429 1893 497">System Responses</th> </tr> </thead> <tbody> <tr> <td data-bbox="776 497 1395 777">               8a1. Attendant asks for payment type &amp; Customer swipes <b>invalid credit card type (not accepted type of card)</b> </td> <td data-bbox="1395 497 1893 777">               8a2. System reads &amp; parses magnetic strip                 8a3. System displays error             </td> </tr> <tr> <td data-bbox="776 777 1395 839">               8a4. Return to step 8             </td> <td data-bbox="1395 777 1893 839"></td> </tr> </tbody> </table>	Actor Actions	System Responses	8a1. Attendant asks for payment type & Customer swipes <b>invalid credit card type (not accepted type of card)</b>	8a2. System reads & parses magnetic strip  8a3. System displays error	8a4. Return to step 8		
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8. Attendant asks for payment type & Customer pays in cash 9. Attendant enters cash tendered into cash register 11. Attendant provides change & receipt to customer 12. Attendant ends transaction	10. System calculates & displays change & prints receipt  13. System saves transaction information & resets pump							

# Exception – Examples (cont.)

## Exception Scenarios:

Actor Actions	System Responses	
1. Attendant greets Customer & asks which pump		
2. Customer identifies pumps		
3. Attendant polls system for pump information		
5. Attendant confirms price with customer & acknowledges price with system		
7. Attendant ask if other items & Customer responds no		
8. Attendant asks for payment type Customer pays in cash		
9. Attendant enters cash tendered in register		
11. Attendant provides change & returns to customer		
12. Attendant ends transaction		

Actor Actions	System Responses
8b1. Attendant asks for payment type & Customer swipes <b>invalid credit card (expired, reported stolen or over limit)</b> correctly (after one or more tries)	8b2. System reads & parses magnetic strip  8b3. System establishes communications with Bank Consortium & transmits merchant information, credit card information & transaction amount
8b4. Bank Consortium disapproves transaction	8b5. System displays disapproval
8b6. Return to step 8	

# Exception Example – Example

## Exception Scenarios:

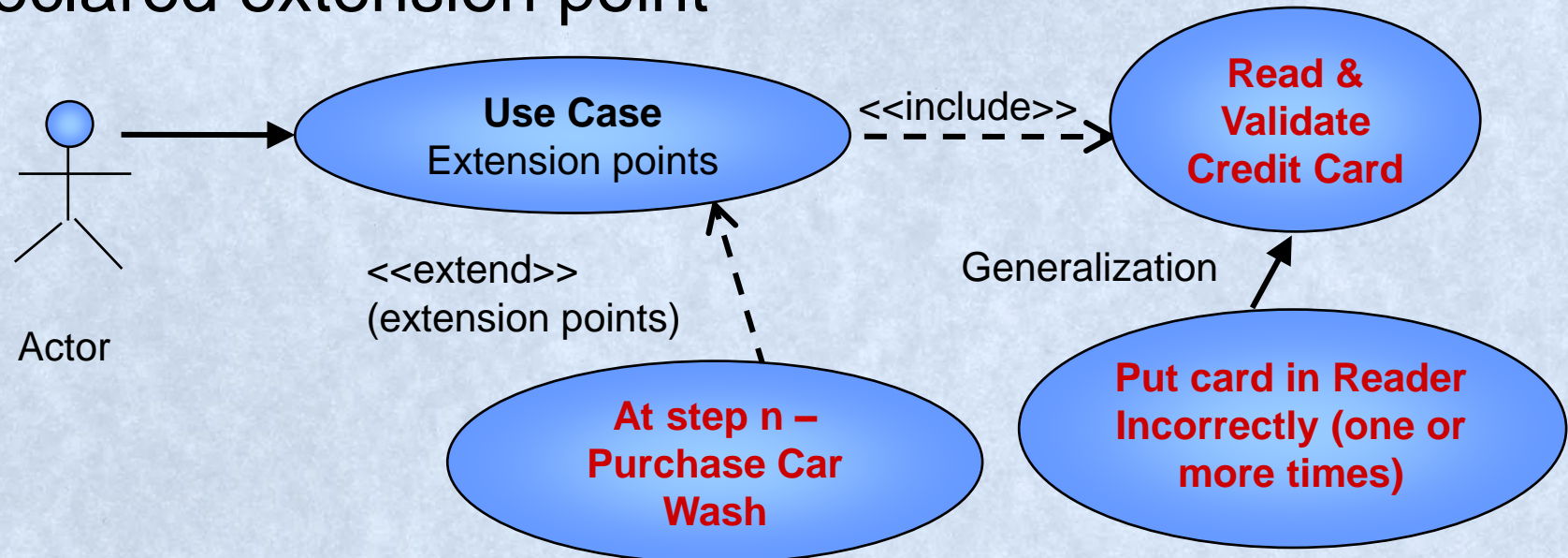
Actor Actions	System Responses
4a2. Attendant manually checks pump display & enters amount into cash register 4a3. Return to step 7	4a1. System <b>can not communicate with pump</b>
8c1. Attendant asks for payment type & Customer swipes <b>invalid credit card type (not accepted type of card)</b> 8c4. Return to step 8	8c2. System reads & parses magnetic strip 8c3. System displays error
8d1. Attendant asks for payment type & Customer swipes <b>invalid credit card (expired, reported stolen or over limit) correctly (after one or more tries)</b> 8d4. Bank Consortium disapproves transaction 8d6. Return to step 8	8d2. System reads & parses magnetic strip 8d3. System establishes communications with Bank Consortium & transmits merchant information, credit card information & transaction amount 8d5. System displays disapproval

# Step 7 – Merge or Create Sub-Use Cases

<<include>> behavior similar across more than one use case

generalization one use case similar to another case but does a bit more

<<extend>> generalization that can only occur at a declared extension point





# Step 8 – Record Additional Information

**Other information that should be captured for each use case:**

- Use case identifier & use case name
- Created by & date
- Modification history (modifiers & dates)
- Use case description
- Priority
- Frequency of use
- Related business rules
- Assumptions

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# Questions

