

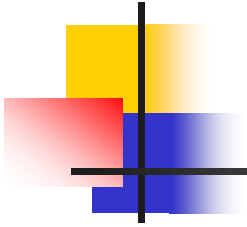


REKAYASA PERANGKAT LUNAK



“Desain Perangkat Lunak ”

Ratna Wardani

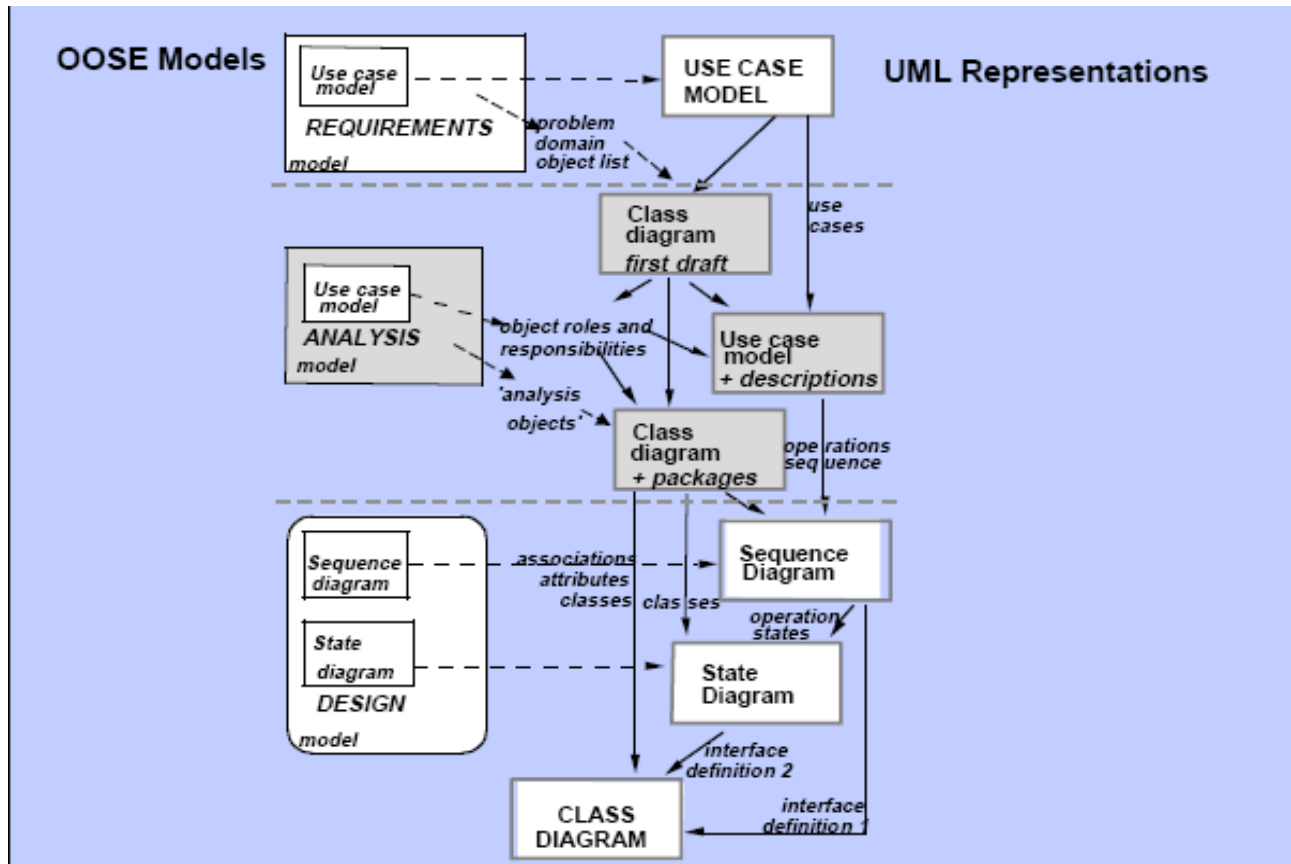


OOSE

(Object Oriented Software Engineering)

Pendekatan OO (OOSE)

- UML



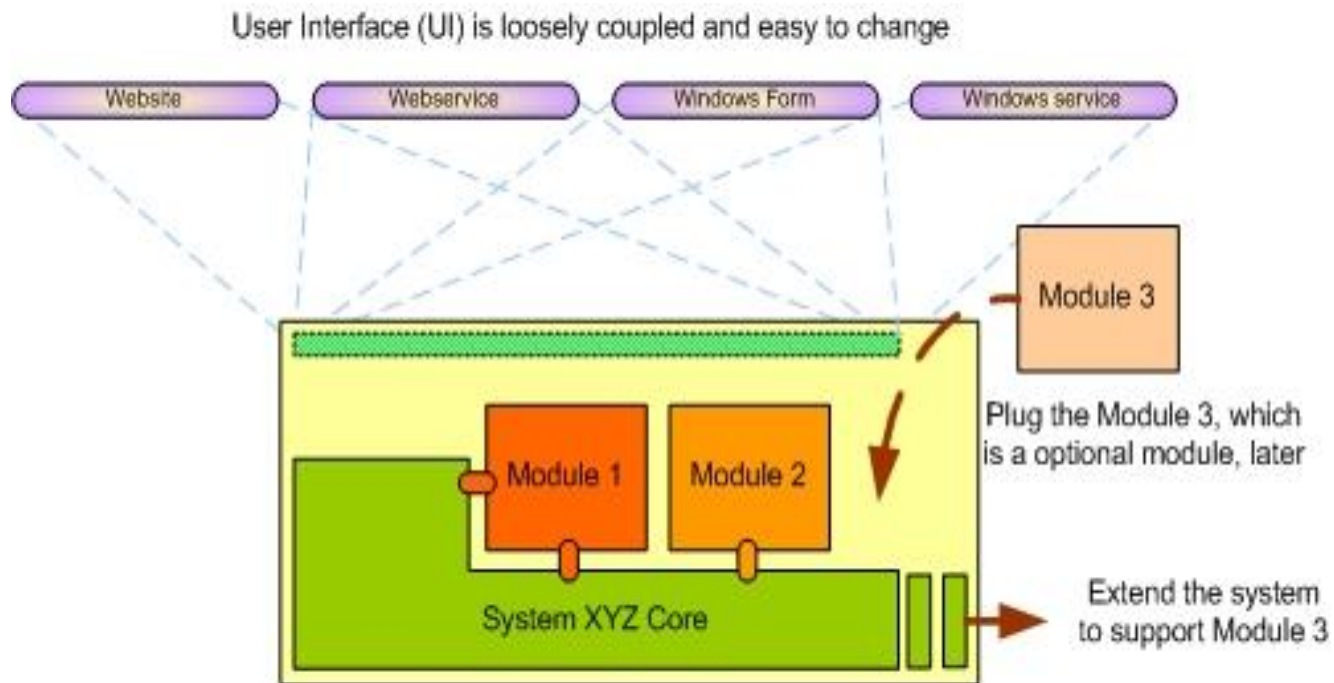


Pendekatan OO (OOSE)

- UML

Pendekatan OO (OOSE)

- Software Arsitektural





Pendekatan OO (OOSE)

- Software Arsitektural

- ✓ Software Architecture is defined to be the rules, heuristics and patterns governing: Partitioning the problem and the system to be built into discrete pieces
- ✓ Techniques used to create interfaces between these pieces
- ✓ Techniques used to manage overall structure and flow
- ✓ Techniques used to interface the system to its environment
- ✓ Appropriate use of development and delivery approaches, techniques and tools.



Pendekatan OO (OOSE)

- Software Arsitektural



Simulasi ATM

- Requirements:

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of \$20), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)



Simulasi ATM

- Requirements:

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.



Simulasi ATM

- Requirements:

The ATM must be able to provide the following services to the customer:

- ✓ A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of \$20.00. Approval must be obtained from the bank before cash is dispensed.
- ✓ A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
- ✓ A customer must be able to make a transfer of money between any two accounts linked to the card.
- ✓ A customer must be able to make a balance inquiry of any account linked to the card.



Simulasi ATM

- Requirements:

A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)



Simulasi ATM

- Requirements:

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.



Simulasi ATM

- Requirements:

The ATM will provide the customer with a printed receipt for each successful transaction, showing the date, time, machine location, type of transaction, account(s), amount, and ending and available balance(s) of the affected account ("to" account for transfers).

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.



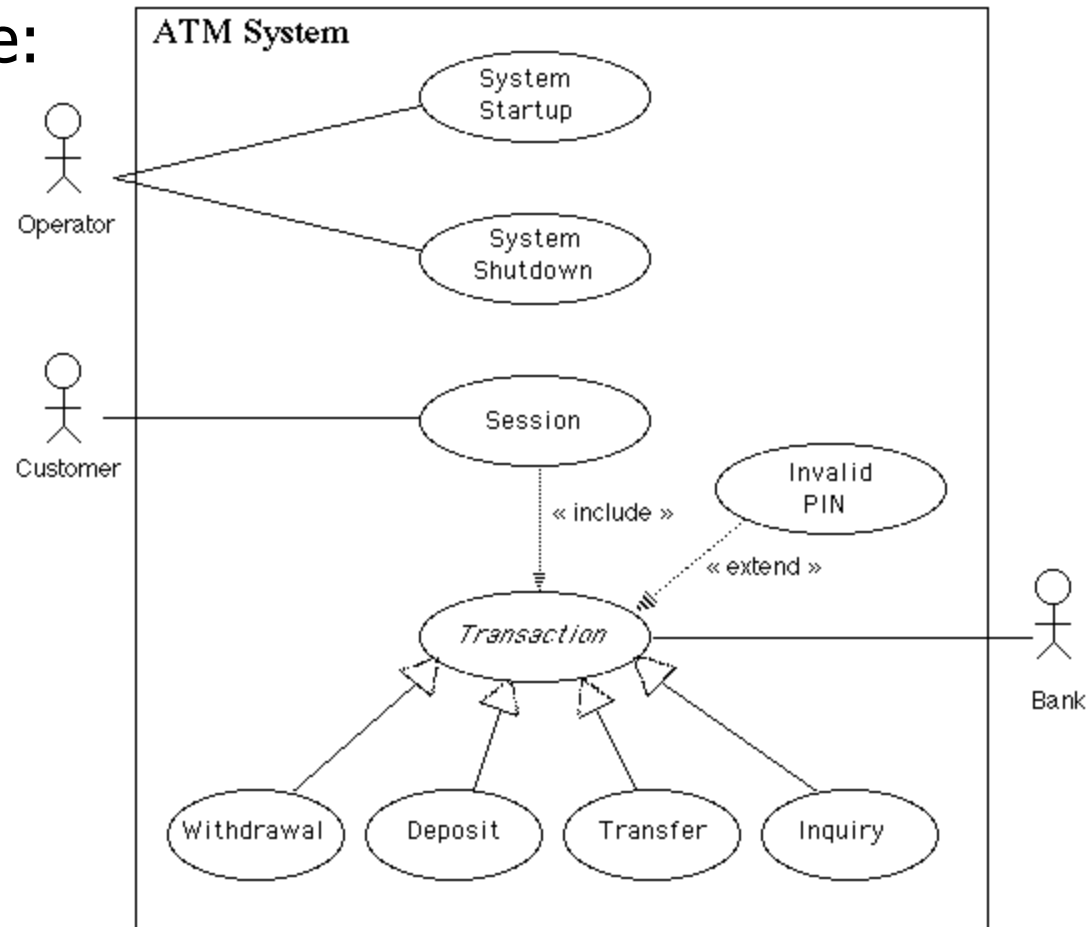
Simulasi ATM

- Requirements:

The ATM will also maintain an internal log of transactions to facilitate resolving ambiguities arising from a hardware failure in the middle of a transaction. Entries will be made in the log when the ATM is started up and shut down, for each message sent to the Bank (along with the response back, if one is expected), for the dispensing of cash, and for the receiving of an envelope. Log entries may contain card numbers and dollar amounts, but for security will *never* contain a PIN.

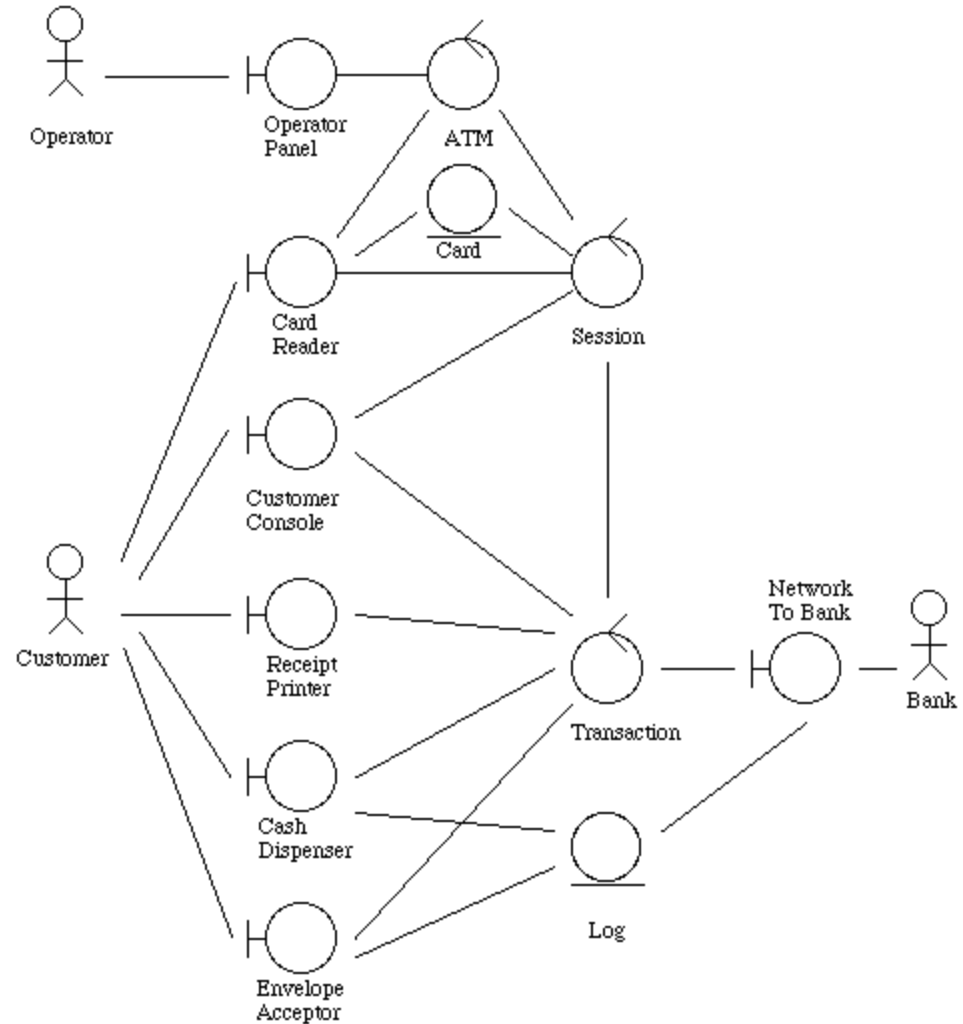
Simulasi ATM

- Use Case:



Simulasi ATM

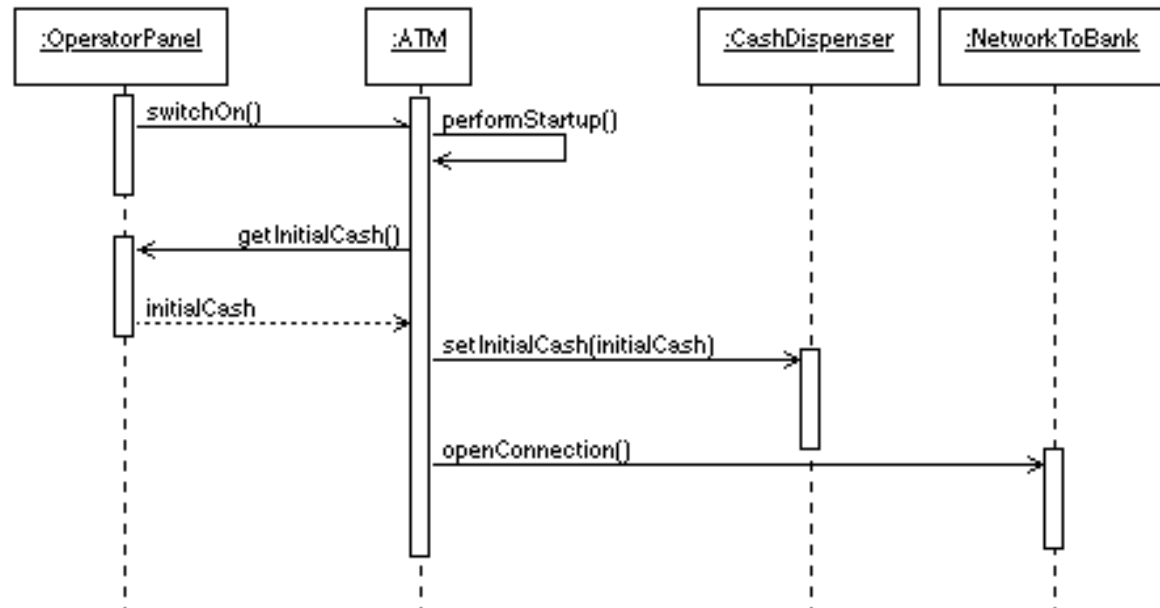
- Analysis :



Simulasi ATM

- Design:

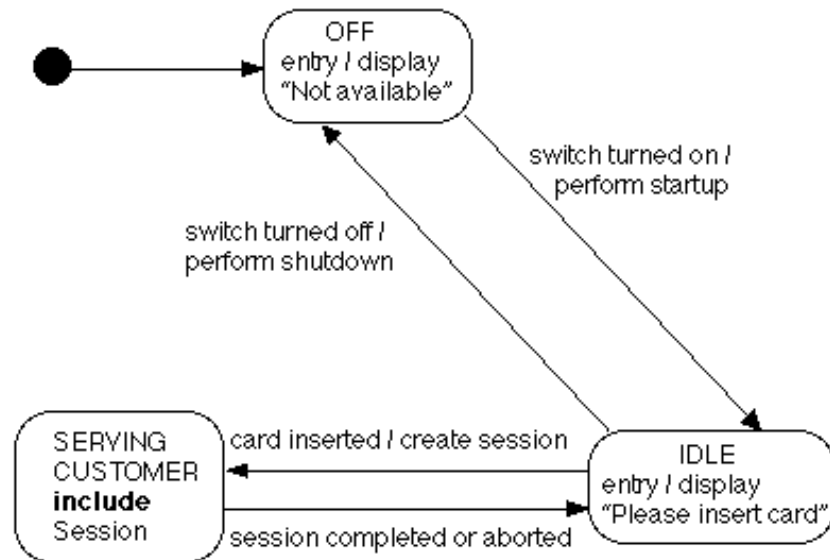
System Startup Sequence Diagram



Simulasi ATM

- Design:

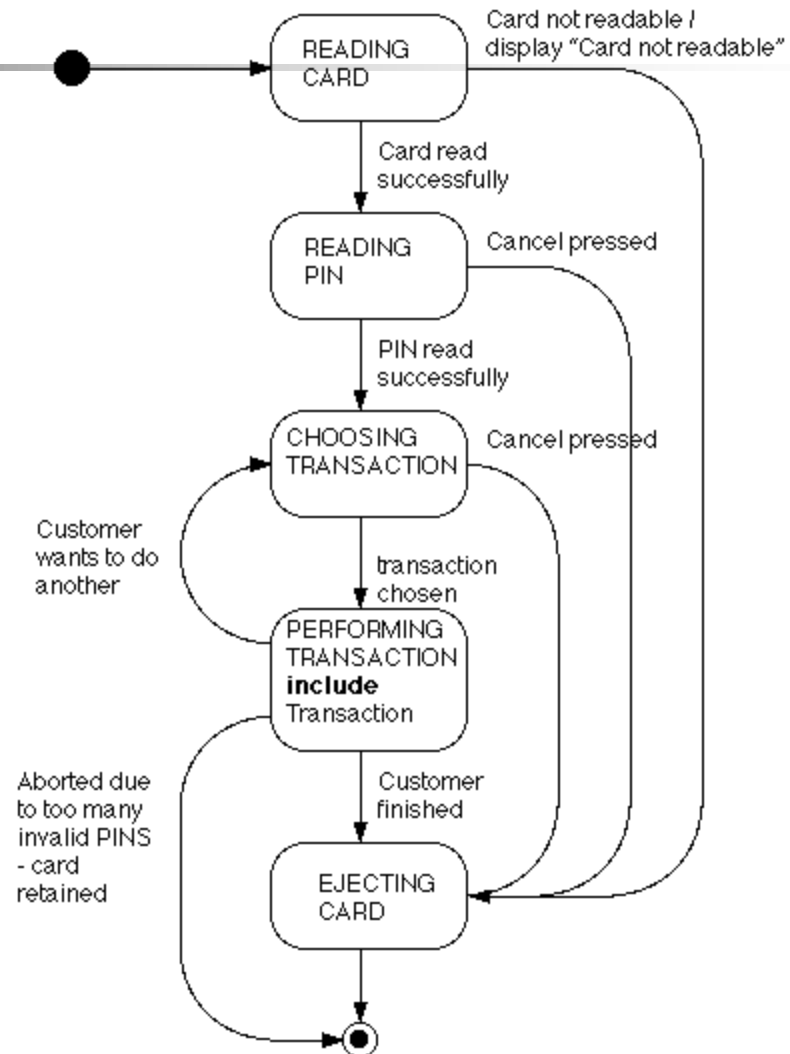
State-Chart for Overall ATM (includes System Startup and System Shutdown Use Cases)



Simulasi ATM

- Design:

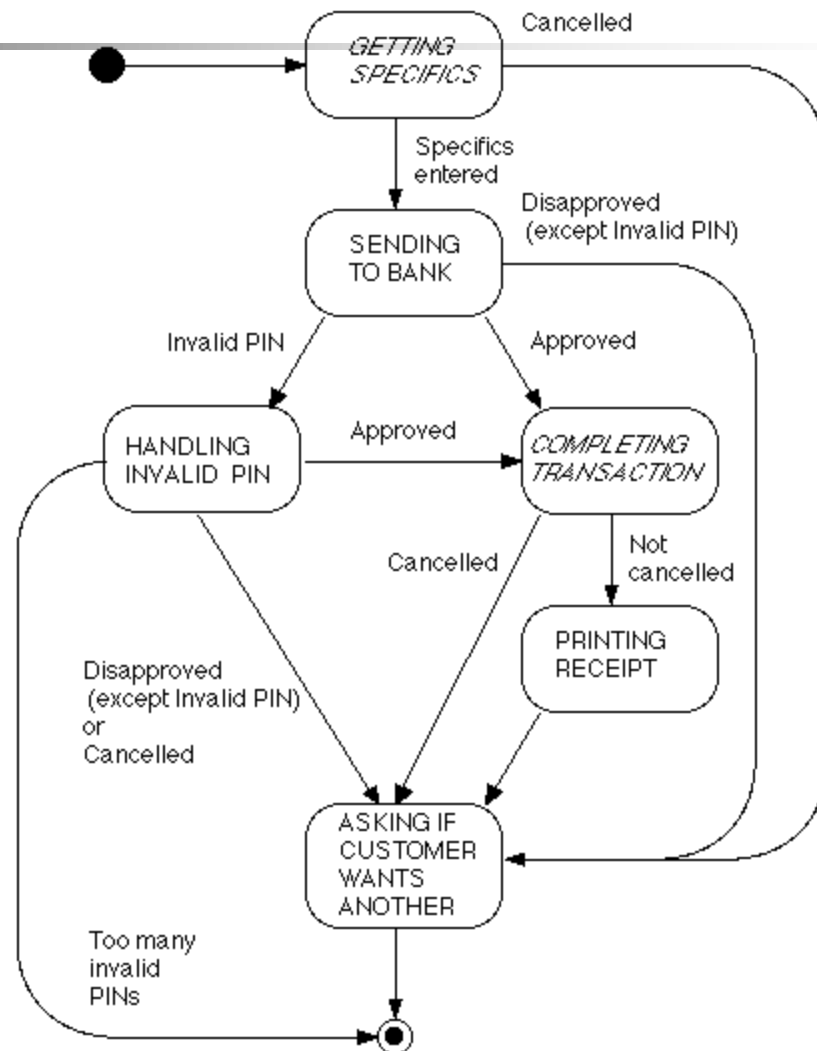
State-Chart for One Session



Simulasi ATM

- Design:

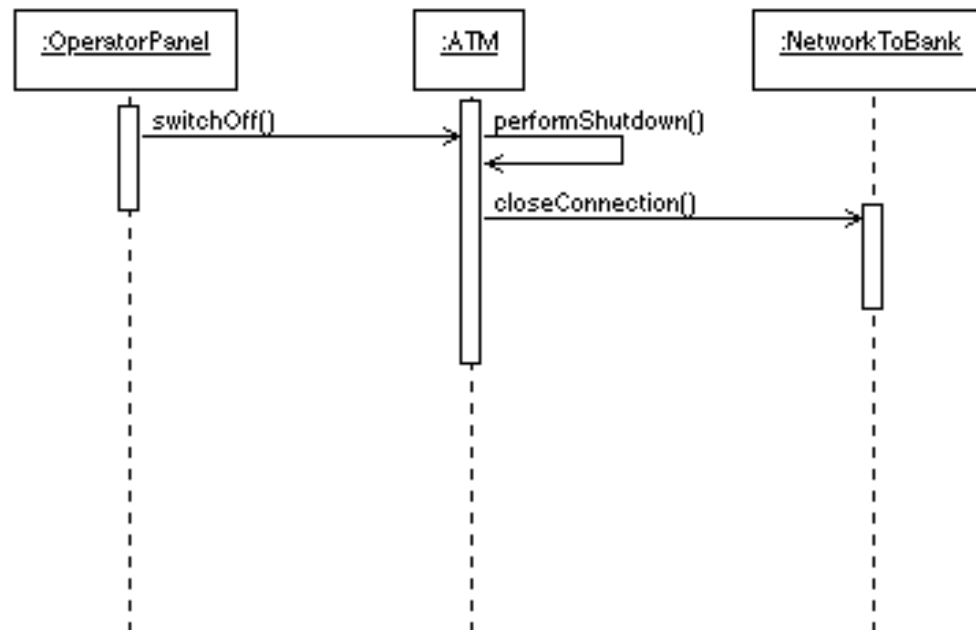
State-Chart for One Transaction
(italicized operations are unique to each particular type of transaction)



Simulasi ATM

- Design:

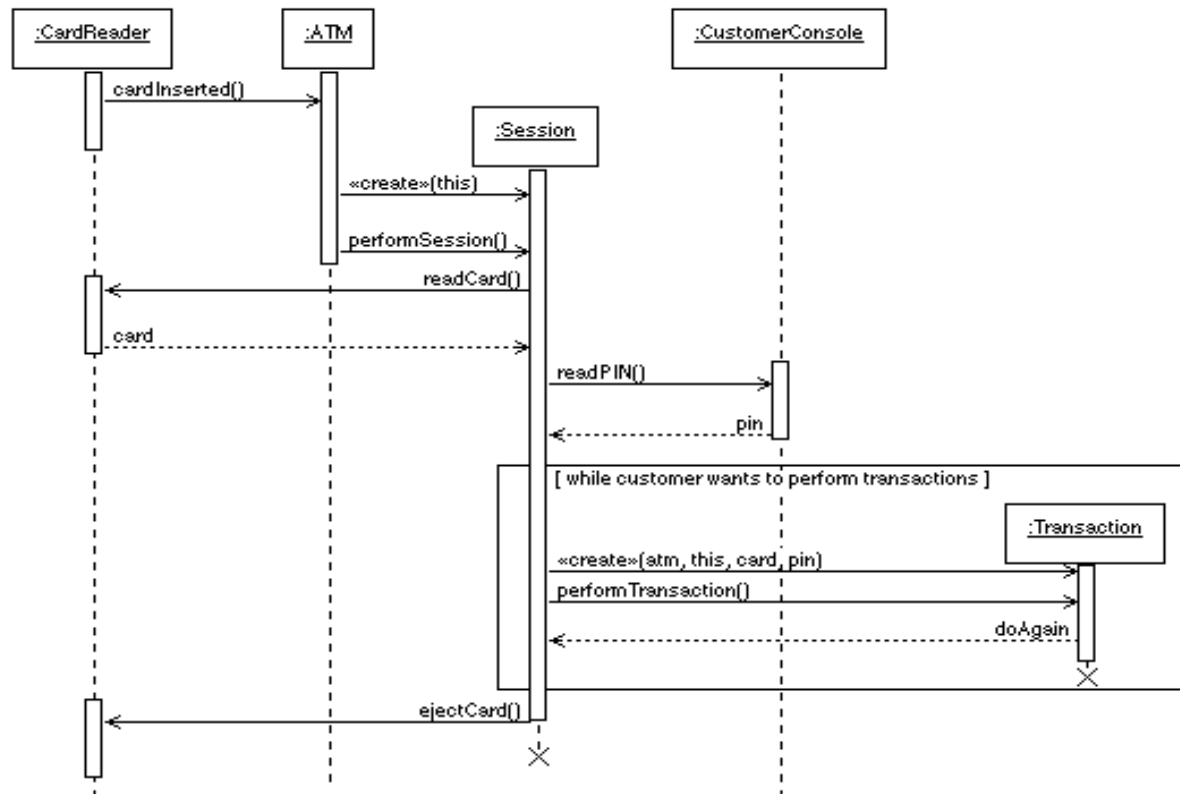
System Shutdown Sequence Diagram



Simulasi ATM

- Design:

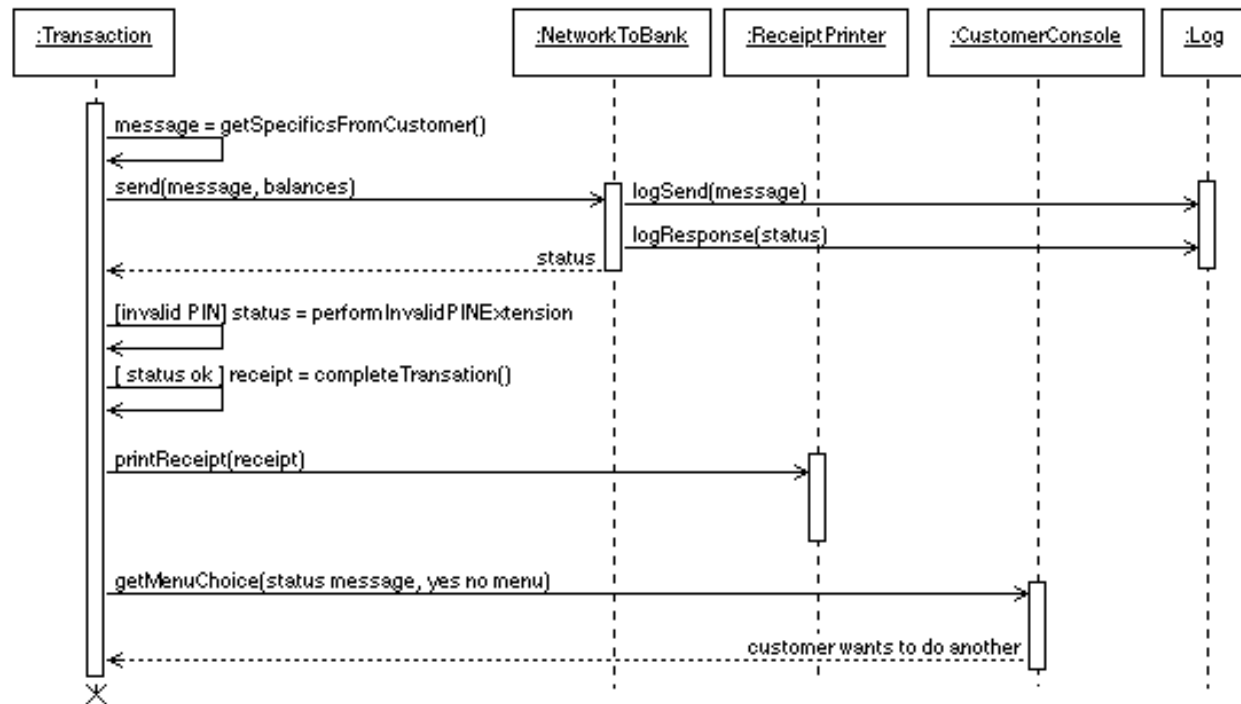
Session Sequence Diagram



Simulasi ATM

- Design:

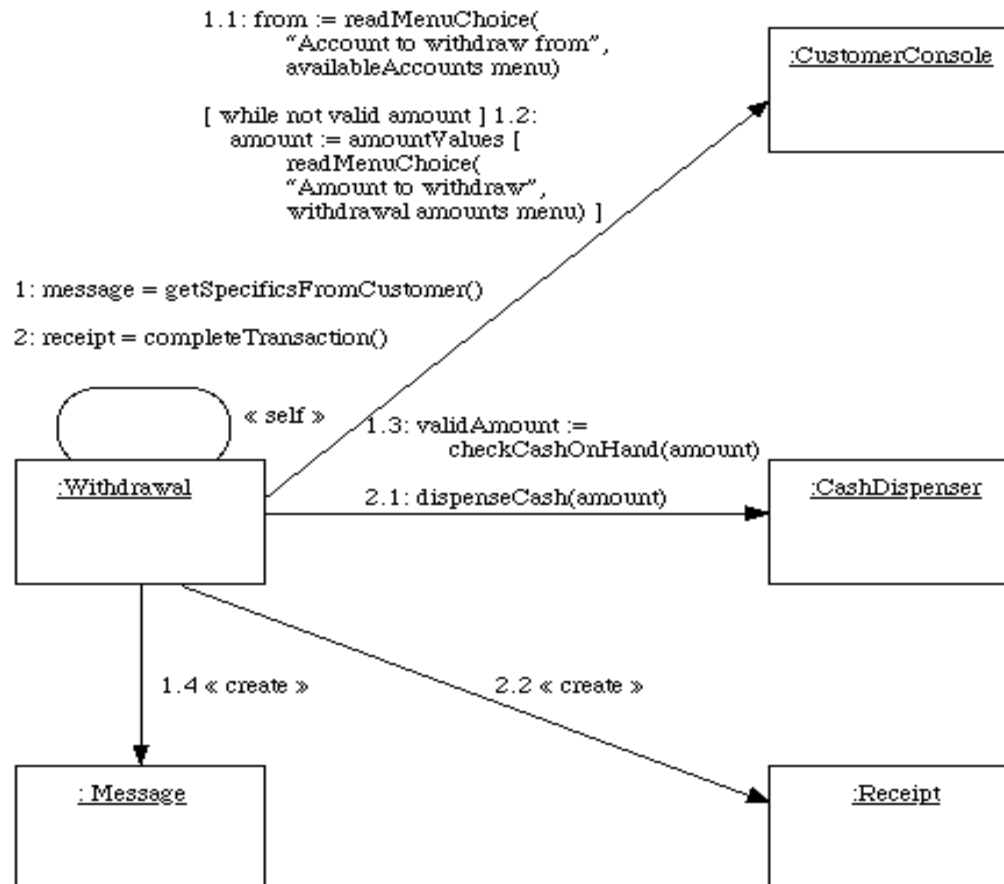
Transaction Sequence Diagram



Simulasi ATM

- Design:

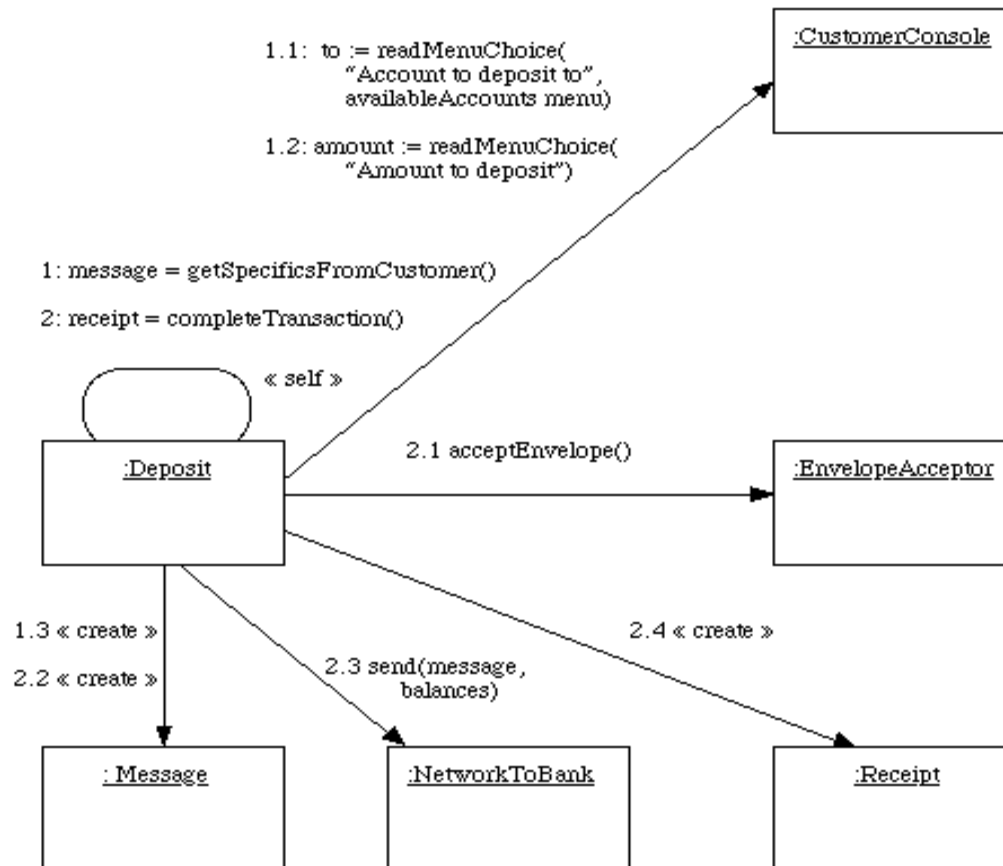
Withdrawal Transaction Collaboration



Simulasi ATM

- Design:

Deposit Transaction Collaboration

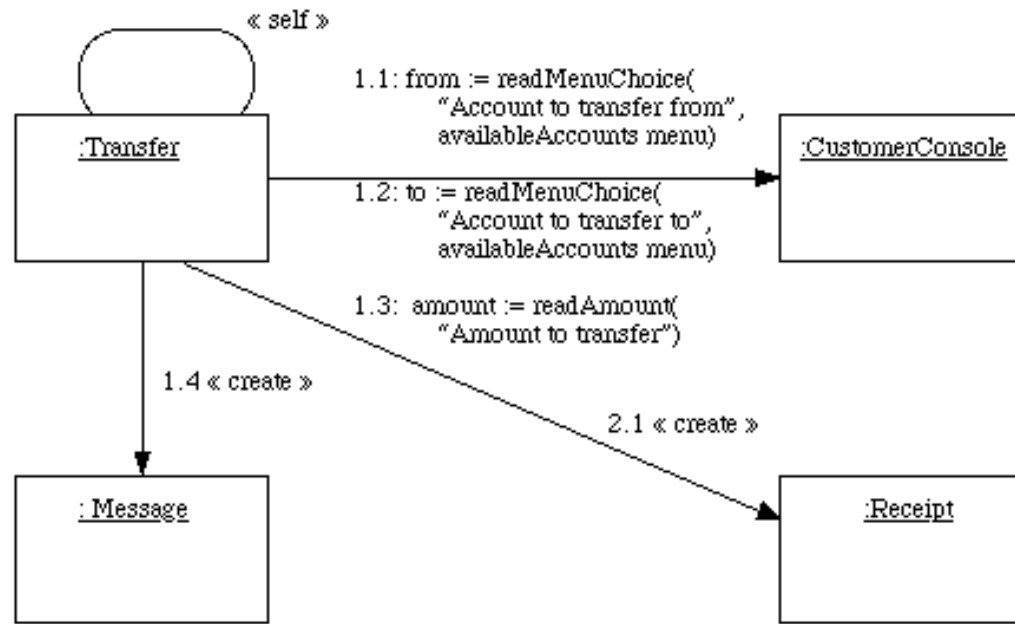


Simulasi ATM

■ Design: Transfer Transaction Collaboration

1: message = getSpecificsFromCustomer()

2: receipt = completeTransaction()



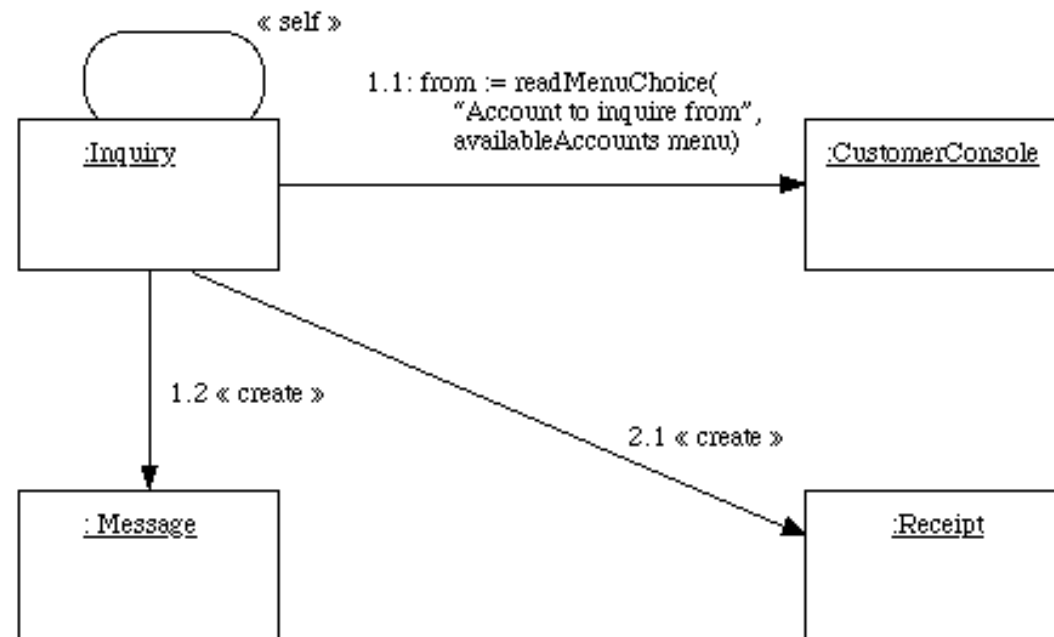
Simulasi ATM

- Design:

Inquiry Transaction Collaboration

1: message = getSpecificsFromCustomer()

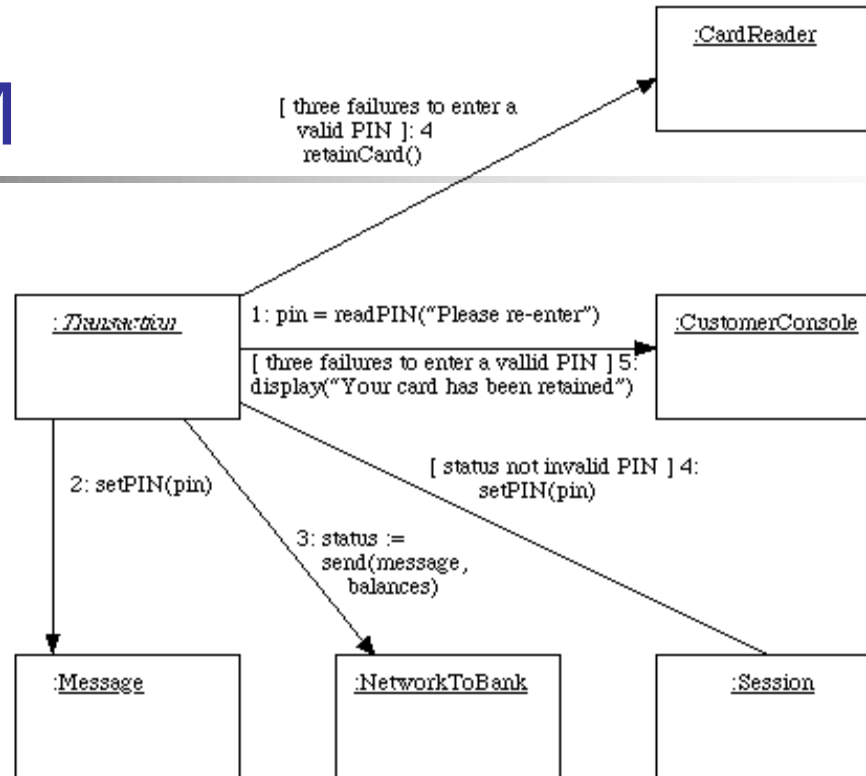
2: receipt = completeTransaction()



Simulasi ATM

■ Design:

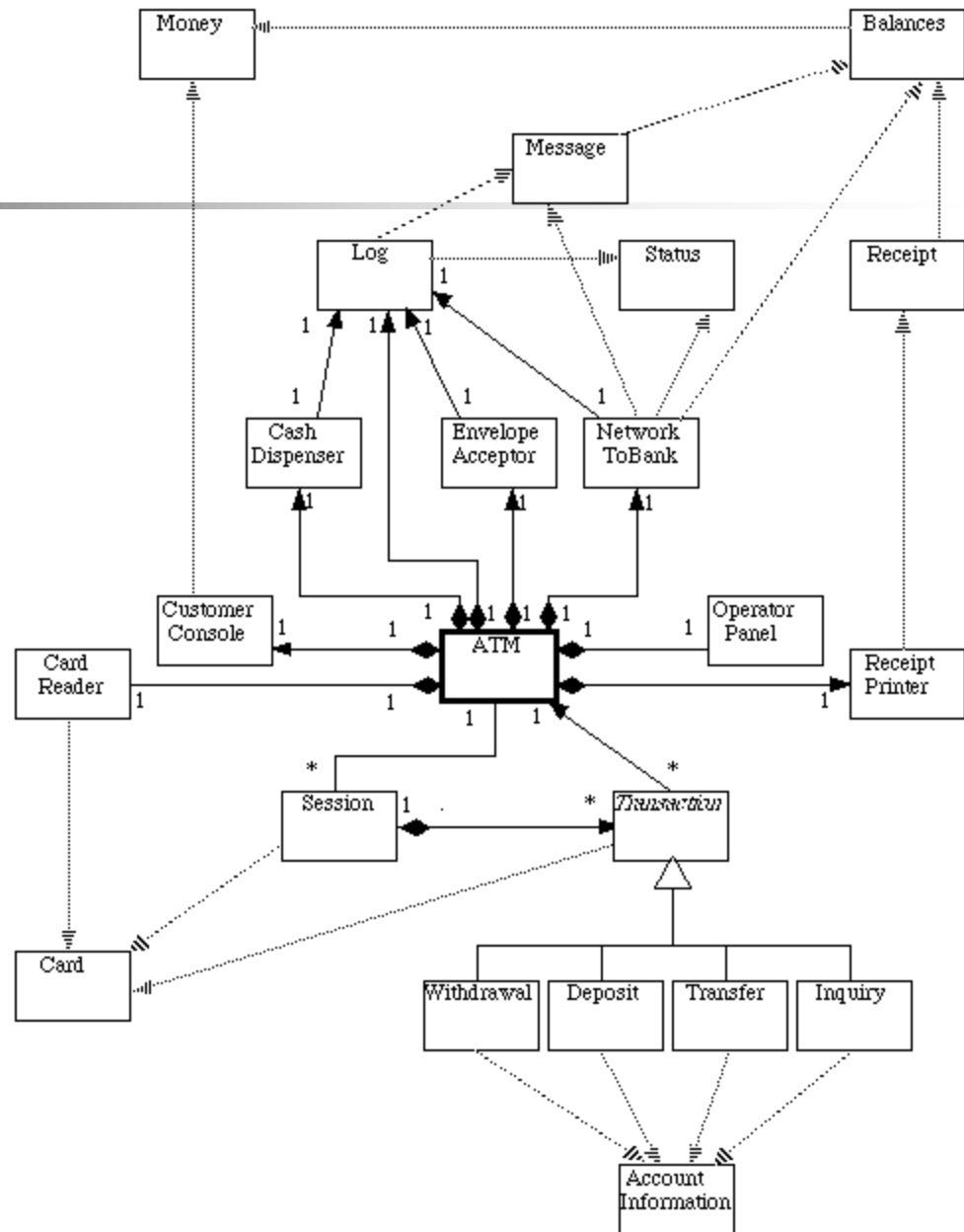
Invalid PIN Extension Collaboration



As soon as the customer enters a valid PIN (`send()` returns a status other than incorrect PIN), the extension is terminated. If the customer re-enters invalid PINs three times, the ATM card is retained and the extension (and session of which it is a part) is aborted. If the user presses Cancel, this extension is aborted immediately, and the transaction that initiated is aborted immediately as well.

Simulasi ATM

- Desain:





Simulasi ATM

- Desain prosedural:

```
checking-acc (balance , my-savings) [<request>]  
  if <deposit request>  
    then become new <checking-acc with updated balance>  
    send <receipt> to customer  
  
  if <show-balance request>  
    send [balance] to customer  
  
  if <withdrawal request> then  
    if balance ≥ withdrawal-amount  
      then become new <checking-acc with updated balance>  
      send <receipt> to customer  
    else let b = new buffer  
      and p = new overdraft-proc  
      {become new insens-acc (b,p) }  
      send <withdrawal request with customer p> to my-savings}
```