Activity Diagrams

Activity Diagram

- **Models dynamic behaviour**
  - **process workflows**
  - **use case scenarios**
  - **operations**
- **Steps involved in performing a task**
  - **like an algorithm**

Activity Diagrams & Use Cases

- **Model flow of control in scenarios**
  - **– all scenarios can be shown on one diagram, if required**
- **Flow-chart *like* representation of a use case**
  - **– can be useful for workshop reviews of scenarios**

Activity Diagrams & BPM

- **Model activities carried out by actors in business domain**
- **Can establish the business context**
  - **– *before* use cases are extracted from the processes**
- **Illustrates interactions between actors in a process**
  - **– using partitions (swimlanes)**

Activities

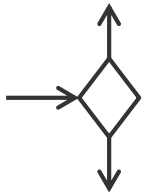
- **Simple Action**
  - **lowest level of detail shown in diagram**

- **Invoke Activity**
  - **includes a number of steps shown in another diagram**

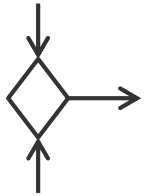
- **Time Event**
  - **triggered by some time related condition**
    - » **e.g. date, time, period (e.g. *n* days since)**

Nodes

- **Initial Node – one per diagram**
- **Final Node – optional & multiple allowed**
  - **– *all* flows stop when reached**
- **Flow Final Node – flow stops, others continue**



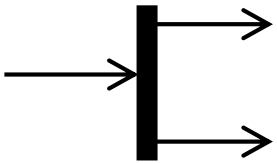
Decision Node – one in, multiple out



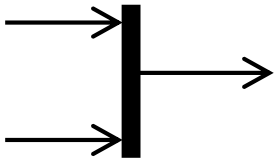
Merge Node – multiple in, one out

Parallel Flows

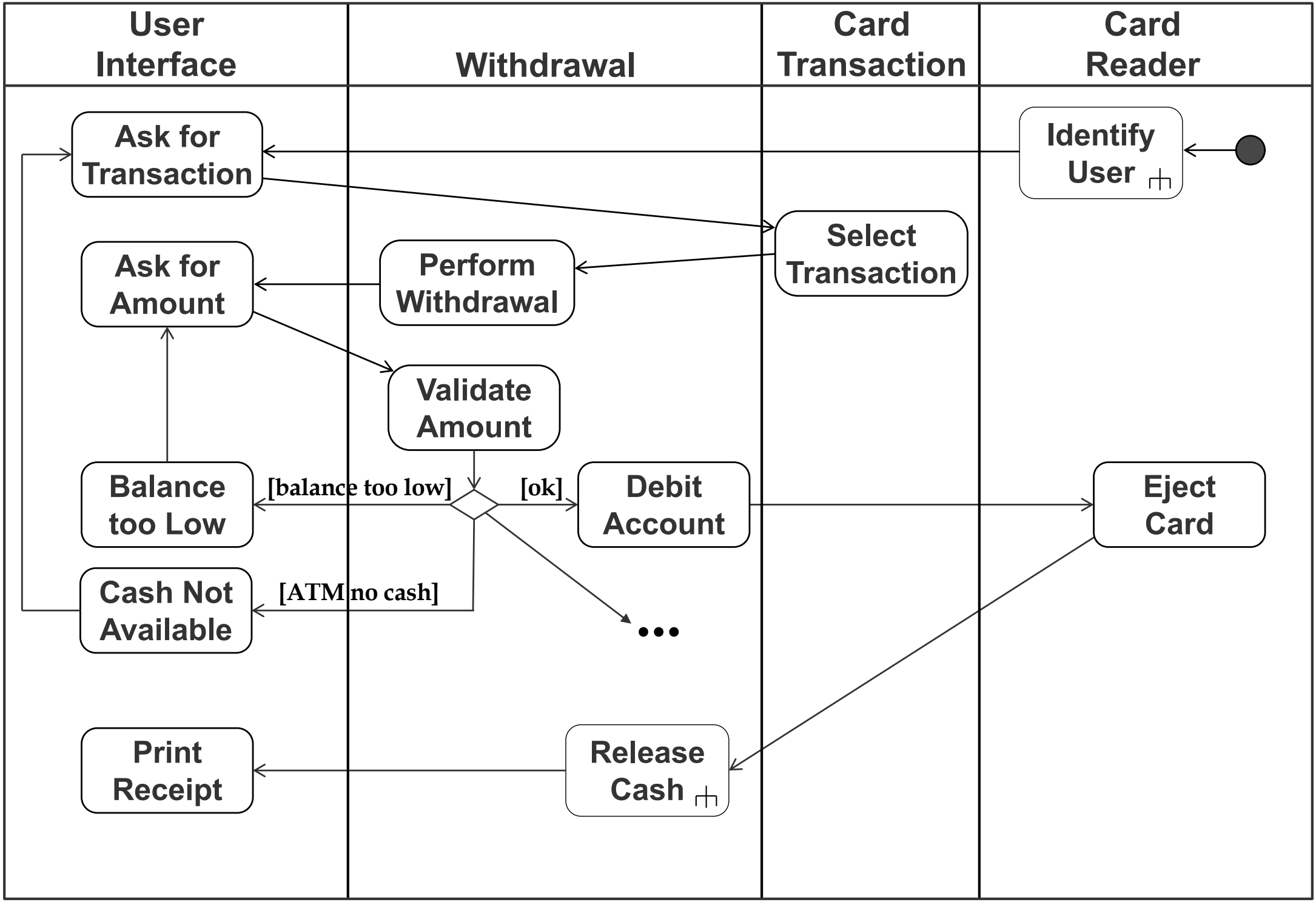
Can have concurrent process flows

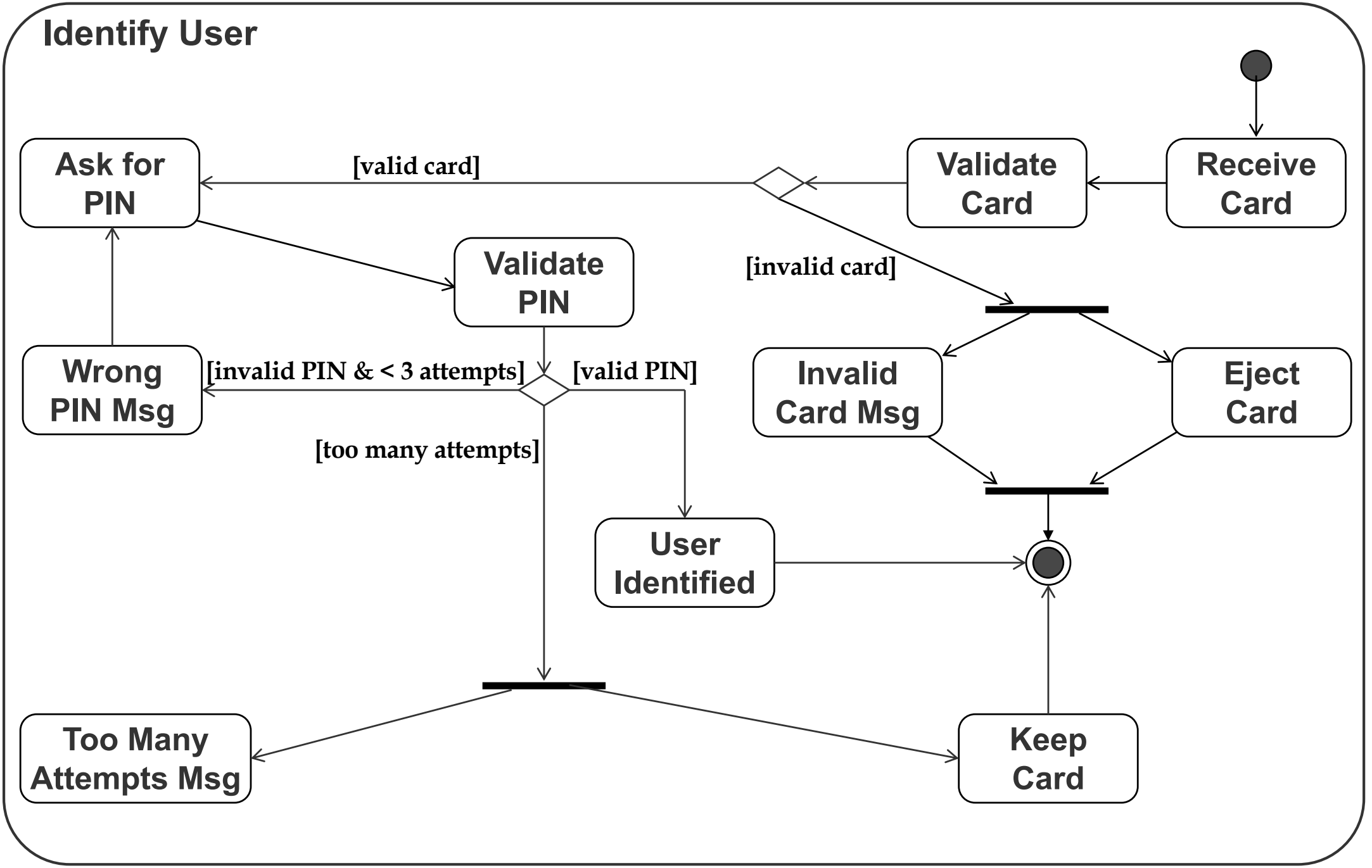


Fork Node – start concurrent flows



Join Node – joins concurrent flows


User Interface
Withdrawal
Card Transaction
Card Reader
Ask for Transaction
Identify User
Select Transaction
Ask for Amount
Perform Withdrawal
Validate Amount
Balance too Low
[balance too low]
[ok]
Debit Account
Eject Card
Cash Not Available
[ATM no cash]
Print Receipt
Release Cash


Identify User
Receive Card
Validate Card
Ask for PIN
[valid card]
[invalid card]
Validate PIN
Wrong PIN Msg
[invalid PIN & < 3 attempts]
[valid PIN]
[too many attempts]
Invalid Card Msg
Eject Card
User Identified
Too Many Attempts Msg
Keep Card

Activity Diagrams in Use Case Modelling

- **Determine triggering event that starts use case flow**
- **Identify actions and determine control flow**
- **Add guard conditions and decision points**
- **Add forking and joining to show parallel activity**
- **Create invoke activities to manage complexity**
- **Group activities into partitions, *if needed***
- **Add flows corresponding to alternative scenarios**
- **Each *path* should correspond to an *individual* scenario**

Reading

- **Larman**
  - **Section 6.18**
  - **Chapter 28**