Use Case (II)

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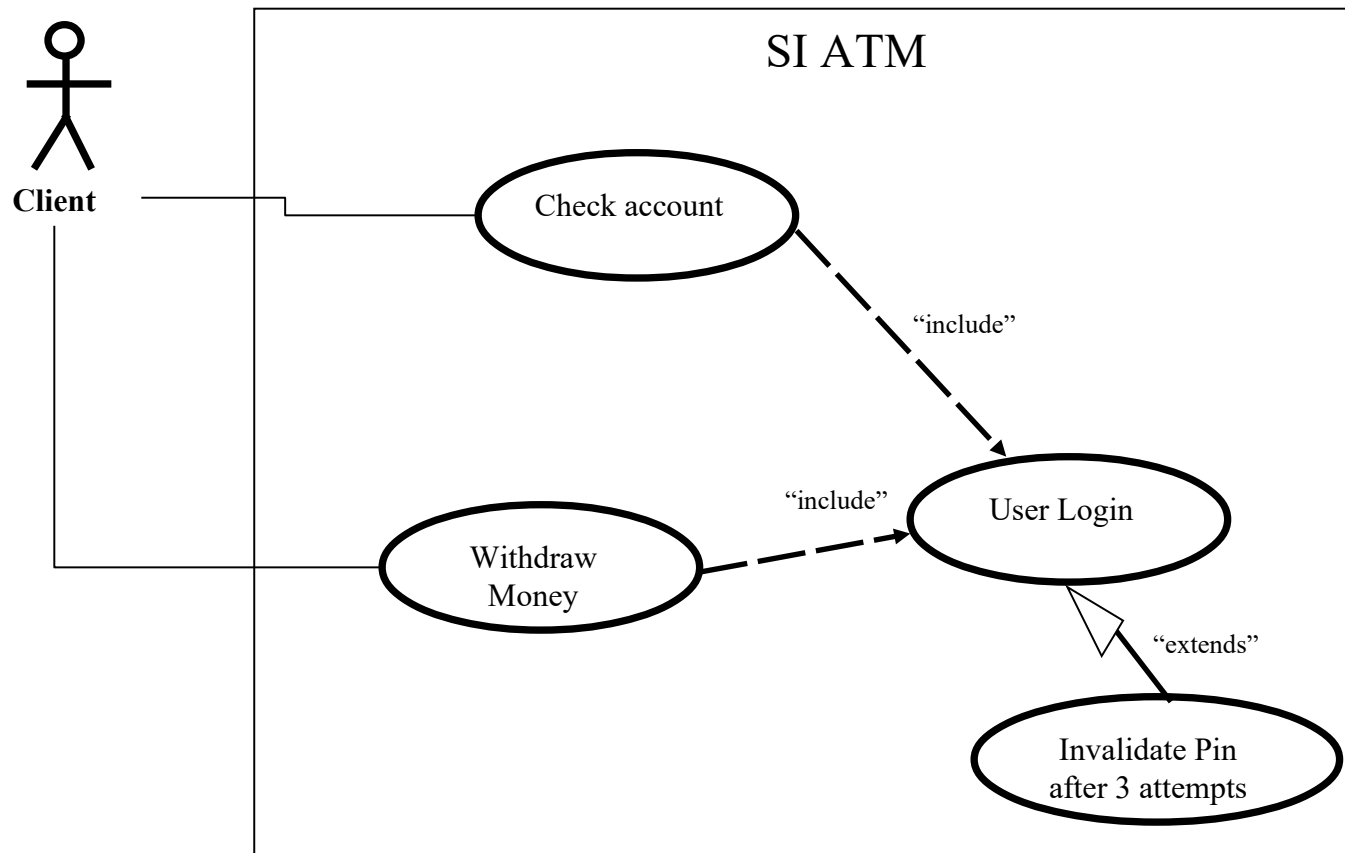
Use Case Diagrams

- System boundaries

- Actors are persons, organizations, or external systems that play roles in interactions with the system

- Use Cases *describe sequences of actions that provide something of measurable value to the actors*

- Interaction or communication

- Relationship

  - Include

  - Extend

  - Generalization

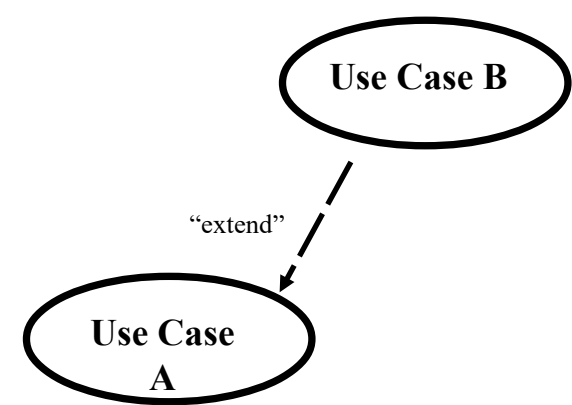# Use Case Diagrams

Relationships

INCLUDE or USES

• is a relationship between two use cases

• is used to show that behaviour of the included use case (the addition) is inserted into the behaviour of the including (the base) use case.

The include relationship could be used:

- to simplify large use case by splitting it into several use cases,

- to extract common parts of the behaviours of two or more use cases.

Relationships

Extend

* is a relationship that specifies how and when the behavior defined in usually supplementary (optional) extending use case can be inserted into the behavior defined in the extended use case.

Extended use case (use case A)

* is meaningful on its own, it is independent of the extending use case.

Extending use case (use case B)

* typically defines optional behavior that is not necessarily meaningful by itself.

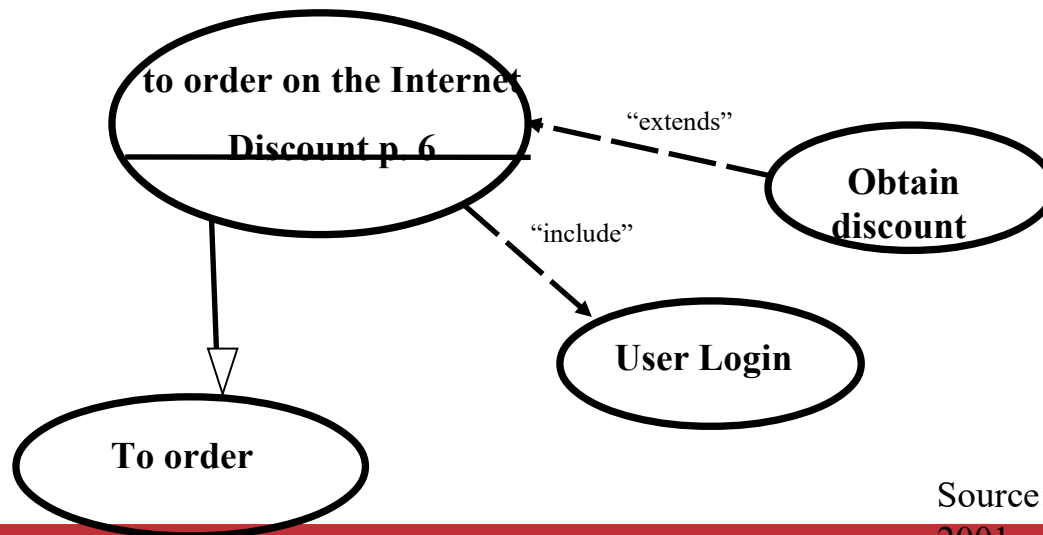The extend relationship is owned by the extending use case.

The same extending use case can extend more than one use case, and extending use case may itself be extended.

The extension takes place at one or more extension points defined in the extended use case.

Source: http://www.uml-diagrams.org/

Relationships

The condition of the extend relationship as well as the references to the extension points are optionally shown in a comment note attached to the corresponding extend relationship.

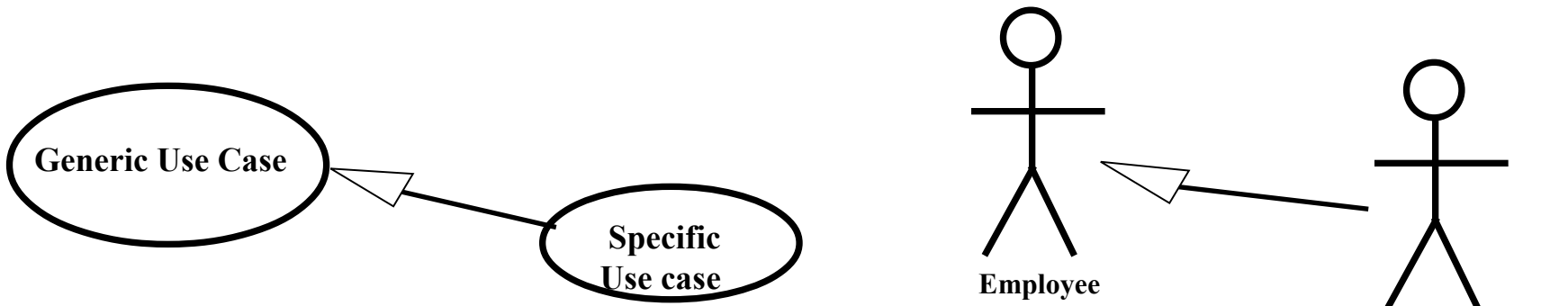Source: Nunes & O´Neill, 2001.

Relationships

Source: https://www.andrew.cmu.edu/course/90-754/umlucdfaq.html

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Relationships

GENERALIZATION

- When there is a use case that is a particular case of another use case.

- The specific use case inherits or replaces the behavior of the general use case .

- It can also be used between actors

Generic Use Case

Specific Use case

Employee

Sales clerk

Relationship

According to Fowler & Scott (1999), relationships should be used in specific situations:

Include -> when there is a repetition of two or more use cases .

Extend -> to describe a change in normal behavior , but in a more controlled manner through extension points in the use case basis.
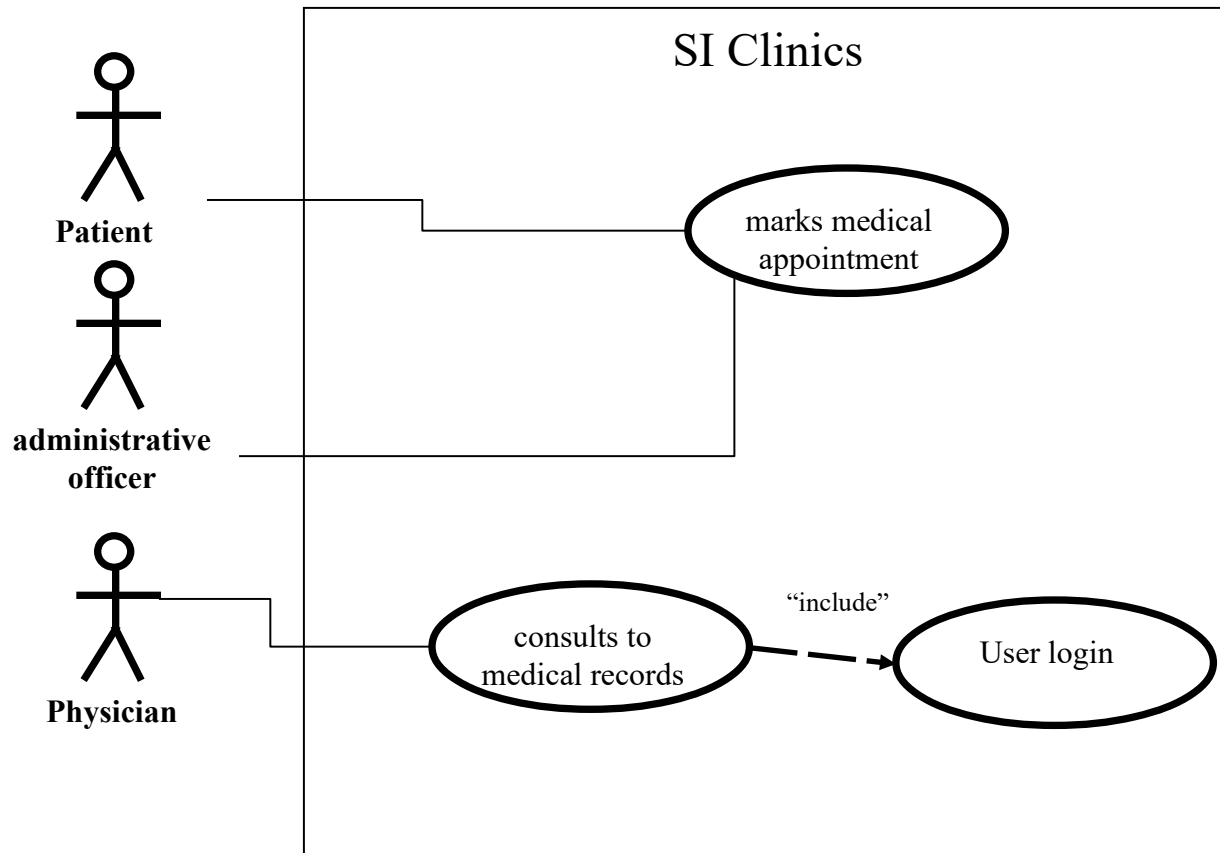
Generalization >- to describe a change in normal behavior, but in a more specific manner .
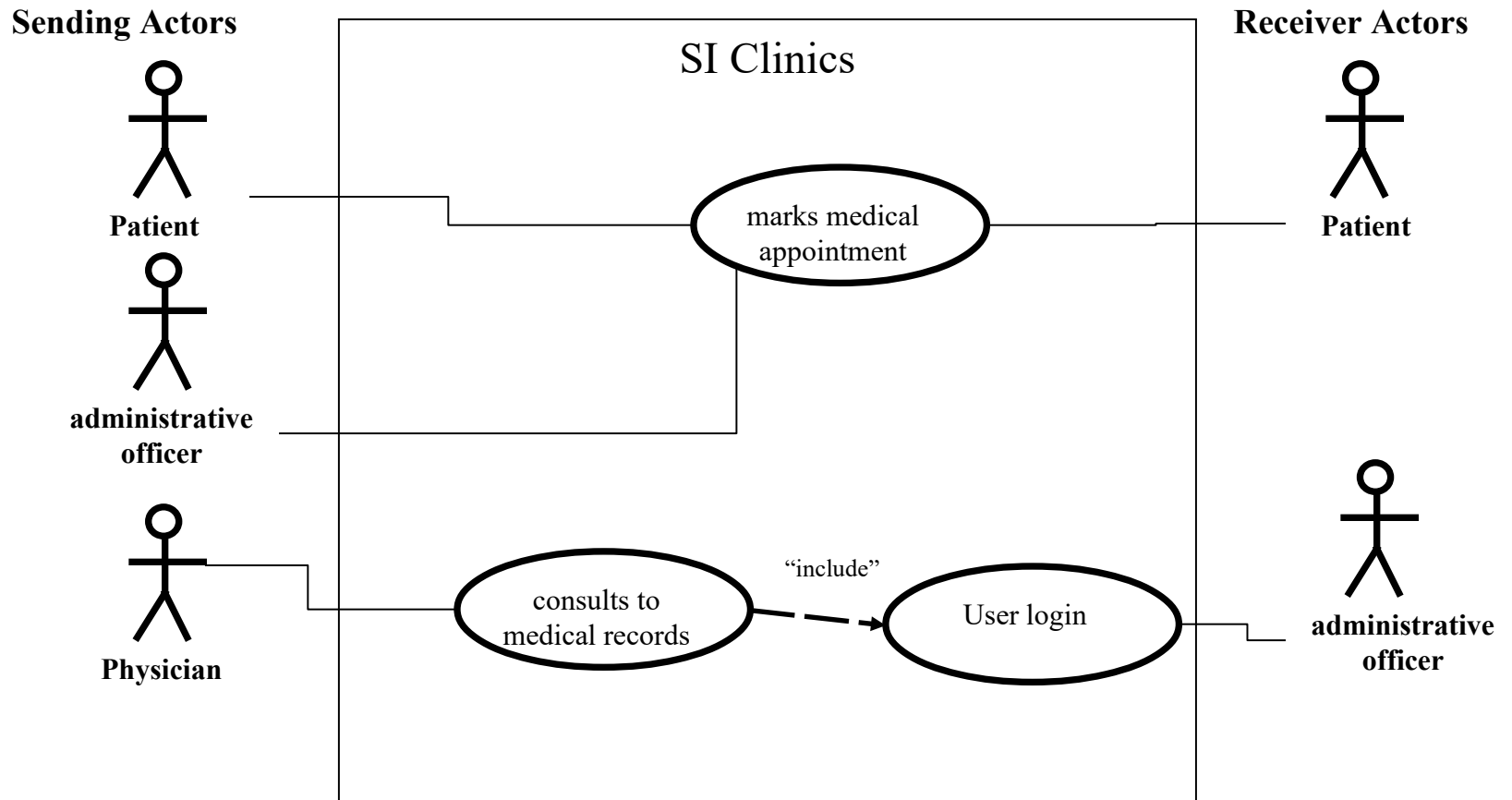
Relationship

Important

- <u>First identify the standard Use Cases</u>

- For each step of the Use Case ask

  - What can go wrong at this point ?

  - Is there an alternative way of operating ?

- Put all variations as extensions of Use case.

Modelling alternatives

Modelling alternatives

Use Cases Templates

1 Brief Description
This use case describes how the Bank Customer uses the ATM to withdraw money to his/her bank account.
3 Preconditions
There is an active network connection to the Bank.
The ATM has cash available.
4 Basic Flow of Events
1. The use case begins when Bank Customer inserts their Bank Card.
2. Use Case: Validate User is performed.
3. The ATM displays the different alternatives that are available on this unit. [See Supporting Requirement SR-xxx for list of alternatives]. In this case the Bank Customer always selects "Withdraw Cash".
4. The ATM prompts for an account. See Supporting Requirement SR-yyy for account types that shall be supported.
5. The Bank Customer selects an account.
6. The ATM prompts for an amount.
7. The Bank Customer enters an amount.
8. Card ID, PIN, amount and account is sent to Bank as a transaction. The Bank Consortium replies with a go/no go reply telling if the transaction is ok.
9. Then money is dispensed.
10. The Bank Card is returned.
11. The receipt is printed.
12. The use case ends successfully.

Source: http://epf.eclipse.org/wikis/openup/core.tech.common.extend_supp/guidances/examples/
use_case_spec_CD5DD9B1.html

Example

- We have the purpose of developing a management information system for Pizzerias Group, enabling customers to order in a restaurant or through the Internet.

- In the restaurant, the customer asks the employee, that will input the customer's order in the system.

- If the order is made through the Internet, the client will have to be identified by username and password (access control). He may obtain a discounted item, if there is a temporary reduction in the price.

- The system should also allow the manager of Pizzeria to make the table reservation, as long as he has permission to do so. The same should happen to the remaining employees.

Use Case Diagram: Conclusions

- A technique used to describe the functionality of a system where Actors interact with Use Case .

- Actors play roles and start Use Cases .

- An use case must deliver something tangible to the actor .

- A scenario is an illustration or example of a Use Cases or an interaction .

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Website

http://www.uml.org/

https://www.omg.org/