

Use Cases

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Use-cases in the development process

A use case is a general description for the way a system can or should be used.

When to use:

- as an aid in the communication with users and stakeholders: simple, mainly scenarios.
- as part of a requirements specification: many details.
- as test cases for the final system to be delivered: concrete scenarios.
- as part of a gui design process, e.g. GUIDE

Use-cases in the development process

User oriented approach (use case driven)

- Making use of use-cases is 'user oriented developing' (black box approach).
- Only add steps to the scenario which are definitely needed and or given by the domain expert.
- We identify different type of requirements: functional and non-functional requirements. In most situations use cases belong to the group of functional requirements.

Use Cases principles 1

- Use cases capture the functionality requirements of a system.
- A use case consists of a set of scenarios for a specific functionality: for a common user goal.
- This user is called the *actor* and can also represent a typically user of a group.
- A use case consists of one typical or normal scenario and more scenarios which treat optional or nontypical situations. (Extensions & Exceptions)
- A use case usually has: a **name**, an **actor**, a **description**, **pre-condition(s)**, **Trigger**, **scenario(s)**, a **result**, **exception(s)**.

Use Cases principles 2

- A use case does **not** refer to gui-type interactions like:
press a button, mouse click action.
Do you know why?
- Make use of terms like: activate, select, insert, ...

Use Case Concepts.

Actor

An entity from outside the system communicating with the system and mostly not part of the system.

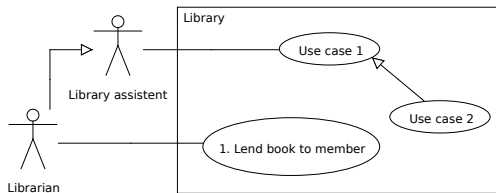


Figure : UML symbols for: actor, system, use cases.

Inheritance is possible for actors and use-cases.

An example: the new Library

The renewed textual description.

- The public library Venlo has four locations: Belfeld, Tegelen, Blerick en Venlo. To borrow a book, one must be member of the library. Membership is valid for one year, starts at the month of subscription and one obtains a member card. Membership fees: no fee under 16 year, 10 € for ages 16-17 and 35 € for ages 18 and up. Students pay 30 €.
- With a subscription every member can make use of the central library, as well as the locations at Blerick, Belfeld, Tegelen. Books, audio cassettes, magazines, video tapes, dvd disks, cd-roms and daisy-rom can be borrowed. There are no fees for lending books or other media and there is no limit on the number of items per year. The maximum numbers of media items is 25 at any time.

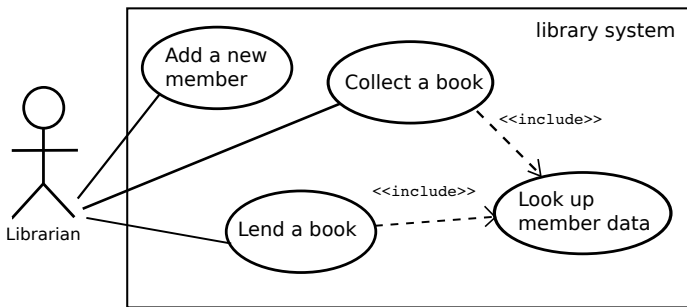
An example: the new Library

- The lending period for media is three weeks. So called sprinters have a lendingperiod of two weeks.
- Extending a lending period can be done twice per item.
- There is no fee for making reservations.
- Extension of the lending period is **not** possible if a reservation has been made for the specific media item. If a book has been brought back after the lending period has expired, a fine of 20 cents per day is charged.
- Lending media or extending the lending period is not possible if the members's debt at the library is larger than 25 euros.

Use Case description example

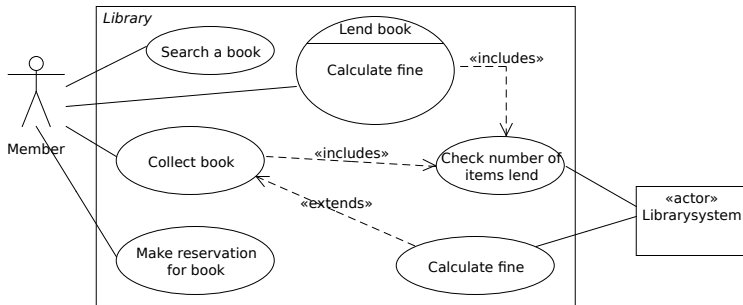
Name:	<i>Lend a book</i>
Actor:	<i>Member</i>
Description:	<i>member of the library borrows one or more books</i>
Pre-condition:	<i>member has membership card on him(her)</i>
Scenario:	<ol style="list-style-type: none"> 1. Actor places membership card and books on scan device. 2. System scans card and books. 3. System lists the book titles and asks member for next action. 4. Actor selects "lend items". 5. System checks number of items borrowed by this member. 6. System acknowledges proper book lending action. 7. System asks if member wants a ticket. 8. If member wants ticket, system prints information: book title, book code, date of transaction, expiry date.
Result:	<i>Member has borrowed the book successfully from the Library.</i>
Exceptions:	<ol style="list-style-type: none"> 2. System message: "INVALID CARD". 2.1 Use case ends here. 5. System message: "You try to borrow more than 25 items!!" 5.1 Use case ends here.

Use case diagram - 1



Sub-Case: A contains relation with `<<include>>`. Part of a use case which on itself is considered as a use case and can be (re-)used by other usecases as well.

Use case diagram - 2



Extends relation with: «extends».

Note the direction of the arrow! Sub use case can be plugged into other usecases at a known 'extension point'.

Use case diagram - 3

Other dependencies are:

«**equivalent**» Same scenario, other name!

«**requires**» Requires another use case to be executed prior to this one.

«**follows**» Will be executed if another use case has been executed

«**resembles**» Two use cases are very similar, but do have different activities.

Are not often used!

Writing a use case

- Identify the boundaries of the system and find the actors.
- Find use cases for every actor.
- Determine the presumptions.
- Determine the interaction.
- Look for exceptions.
- Can sub-use cases be identified?
- Draw the use case diagram.

Exercise: Library administration

Name:	<i>Return books to the library.</i>
Actor:	<i>Member</i>
Description:	<i>Member of the library returns his/her books to the library.</i>
Pre-condition:	<i>Member has valid membership card on him(her).</i>
Scenario:	<ol style="list-style-type: none"> 1. Actor places membership card and books on scan device. 2. System scans member card and books. 3. System lists the book titles and asks member for next action. 4. Actor selects "return items". 5. ... 6. ... 7. ... 8. ... 9. ...
Result:	...
Extensions:	...
Exceptions:	...

Finish this use case and find and describe the associated scenarios.